THE CITY OF SAN DIEGO

ADDENDUM TO ENVIRONMENTAL IMPACT REPORT No. 193036

Project No. 193036
SCH No. 2010051073

SUBJECT: NEW ONE PASEO: GENERAL PLAN AMENDMENT, COMMUNITY PLAN AMENDMENT, PRECISE PLAN AMENDMENT, LAND DEVELOPMENT CODE AMENDMENT, SITE DEVELOPMENT PERMIT, NEIGHBORHOOD DEVELOPMENT PERMIT, STREET VACATION, PUBLIC UTILITY EASEMENT VACATION, AND VESTING TENTATIVE MAP for the construction of a mixed-use development encompassing a maximum of 1,175,871 gross square feet (gsf) consisting of approximately 280,000 gsf of commercial office use, approximately 95,871 gsf of commercial retail, and approximately 800,000 gsf of residential consisting of 608 multifamily units on a 23.6-acre graded and vacant site. The site is located at the southwest corner of the intersection of Del Mar Heights Road and El Camino Real (Assessor's Parcel Numbers 304-070-43, 307-070-49, 304-070-52, and 304-070-57) in the Carmel Valley community within the City of San Diego, California. The site is located in the CVPD-MC Zone of the Carmel Valley Community Plan, the Carmel Valley Employment Center Precise Plan, and Council District 1.

Applicant: Kilroy Realty, LP

I. PROJECT DESCRIPTION:

The project site is comprised of 23.6 acres located in the developed Carmel Valley community within the City of San Diego, California (City) (see Figure 1, *Project Vicinity Map*). More specifically, the property is located at the southwestern corner of Del Mar Heights Road and El Camino Real. High Bluff Drive is located directly west of the project site, Interstate 5 (I-5) is approximately 0.25 mile to the west of the project site, and State Route (SR) 56 is located approximately 1.0 mile to the south of the project site.

The New One Paseo Project proposes to develop a mixed-use project, including commercial retail, office, and residential uses. The total size of the project is 1,175,871 gsf. Table 1 presents the land use distribution of the various uses proposed as part of the project. Figure 2, *Site Plan*, shows the proposed site plan for the New One Paseo Project.

Table 1 NEW ONE PASEO LAND USES		
Land Use	**Gross Square Footage**	**Number of Units**
Office (Multi-tenant)	280,000	--
Retail	95,871	--
Residential	800,000	608
TOTAL	**1,175,871**	**608**

The project would also include public space areas, internal roadways, landscaping, hardscape treatments, utility improvements, and parking facilities to support these uses. The project would be graded in a single phase. A total of 2,747 parking spaces would be provided throughout the site in subsurface garages, two above-ground parking structures, and surface parking lots. Access to the project site from Del Mar Heights Road would be taken from one signalized intersection and one right-in/right-out only driveway. Access to the site from El Camino Real would be taken from one signalized intersection, and three right-in/right-out only driveways.

The project's Transportation Demand Management (TDM) Plan would include a privately operated shuttle until regional bus service becomes available to the project or within close proximity. The shuttle would provide service to the Solana Beach Transit Center.

The New One Paseo Project would include a number of sustainable project features, including but not limited to, facilities that encourage bicycle and pedestrian movement and incorporate energy and water conservation.

Offsite improvements would include:

- Installation of traffic signal system upgrades and optimization on a total of 10 intersections along Del Mar Heights Road from the intersection of Mango Drive to the intersection of Lansdale Drive. The upgrades and optimization shall include a communications system, emergency vehicle preemption system, controllers, detection, CCTV monitoring system, and optimized traffic signal timing.

- Reconfiguration of the medians within the Del Mar Heights Road and El Camino Real rights-of-way along the project frontage in order to provide sufficient access to the project and to mitigate project impacts.

- Addition of a fourth leg to the existing intersection of El Camino Real and the Del Mar Highlands Town Center driveway.

- Installation of a traffic signal at the intersection of Carmel Creek Road and Del Mar Trail (Mitigation Measure 5.2-5).

- Extension of the existing westbound right-turn lane and construction of a second, westbound right-turn lane on Del Mar Heights Road at the northbound I-5 on-ramp (Mitigation Measure 5.2-2).

- Construction of a third, northbound left-turn lane, and associated public improvements needed to accommodate the additional turn lane, at the intersection of Del Mar Heights Road and High Bluff Drive (Mitigation Measure 5.2-6).

- Construction of an eastbound right-turn lane at the intersection of Del Mar Heights Road and El Camino Real (Mitigation Measure 5.2-7).

In order to implement/construct the New One Paseo Project, the following discretionary actions are required: General Plan Amendment (GPA), Community Plan Amendment (CPA), Land Development Code (LDC) Amendment, Precise Plan Amendment (PPA), a Site Development Permit (SDP), a Neighborhood Development Permit (NDP), Street Vacation, Public Utility Easement Vacation, and a Vesting Tentative Map (VTM). The project site is proposed to be designated as Multiple Use in the General Plan and Community Village in the Community Plan.

II. ENVIRONMENTAL SETTING:

The project site is currently vacant but has been graded in the past. Existing vegetation within the central portion of the site is minimal. Parkway landscaping is located along Del Mar Heights Road, and consists of ground cover and mature trees, primarily eucalyptus and pine.

The project site was graded between 1986 and 1990 as a part of the North City West Development Unit 2 (i.e., Carmel Valley Employment Center) mass grading. The site ranges from approximately 174 feet above mean sea level (amsl) at the southeastern corner to approximately 246 feet amsl at a berm near the northwestern site boundary. Most of the project site is terraced into three building pads with an approximately 15-foot difference in grade elevation between each set of pads.

The project site is surrounded by development including the Del Mar Highlands Town Center to the east, one single family residence to the southeast, office buildings to the south and west, and multi-family residential to the north. Del Mar Highlands Town Center is a 30-acre shopping center that contains retail shops, restaurants, major grocery store, major drug store, a theater, plaza, and a small outdoor amphitheater within one- to two-story structures. The single-family residence to the southeast is a remnant of a former ranch. The three office buildings located to the south are three stories over parking. The office buildings directly to the west are two- to four-story buildings. Multi-family development includes 2 and 3-story buildings located to the north across Del Mar Heights Road.

III. PROJECT BACKGROUND:

The Final EIR (FEIR) for the One Paseo Project was certified on February 23, 2015. The FEIR addressed a development proposal consisting of 1,857,444 gsf including residential, retail, office and hotel uses; this development is referred to herein as the “Originally Proposed Project.” Subsequent to the preparation of the Draft EIR (DEIR), the project was redesigned to reduce the development to 1,454,069 gsf. The major changes reflected in the redesigned project included elimination of the hotel, reduction in square footage of residential, retail and office uses, and the addition of a green space. An analysis of this redesigned project was included in the One Paseo EIR as the “Reduced Main Street Alternative,” and the Alternatives section was circulated for additional public review.

On February 23, 2015, the City Council approved the Reduced Main Street Alternative (Approved Project), and approved a GPA, CPA, PPA, (collectively, the Planning Amendments), SDP, NDP, Conditional Use Permit, VTM, Street Vacation, Public Utility Easement Vacation, amended the Municipal Code to add the Carmel Valley Planned District Mixed-Use Center Zone (CVPD-MC) to the Carmel Valley Planned Development Ordinance (PDO), and rezoned the site to that new zone. The City Council also certified the FEIR (One Paseo EIR) and adopted Findings, a Statement of Overriding Considerations and a Mitigation Monitoring and Reporting Program (MMRP) for the Approved Project.

After the City Council approved the Approved Project, a referendum campaign to repeal the Planning Amendments began. The City Clerk certified the necessary number of signatures to qualify the referendum on April 24, 2015. On May 21, 2015, the City Council rescinded the Planning Amendments at the project applicant’s request. The development proposal was subsequently modified to reduce the scale of the project. The redesigned project is referred to as the “New One Paseo Project.”

As shown in Table 1 above, the New One Paseo Project retains the residential, retail and office uses from the Approved Project, but eliminates the cinema and green space. The New One Paseo Project reconfigures the site plan. The total number of residential units would remain the same as in the Originally Proposed Project and the Approved Project. The square footage of retail and office uses would be reduced from both the Originally Proposed Project and the Approved Project. A comparison of the land uses included in the New One Paseo Project with the Approved Project and the Originally Proposed Project is included in Table 2.

With respect to the Originally Proposed Project, the New One Paseo Project would result in an approximately 48 percent reduction in the amount of office space (536,000 to 280,000 gsf), and an approximately 56 percent reduction in the amount of retail space (220,000 to 95,871 gsf). The number of residential units would remain unchanged, but the total residential square footage would decrease by approximately 14 percent from 930,000 to 800,000. The hotel would be eliminated. The overall square footage would decrease by 37 percent from 1,857,440 to 1,175,871 gsf.

When compared with the Approved Project, the New One Paseo Project would reduce the office space by approximately 43 percent. The retail component would be reduced by approximately 52 percent. The cinema would be eliminated. The number of residential units would remain unchanged, but the square footage would increase by approximately 12 percent. Overall the total square footage would be reduced by 19 percent from 1,454,069 to 1,175,871 gsf.

Table 2
LAND USE COMPARISON OF THE NEW ONE PASEO PROJECT WITH THE ORIGINALLY PROPOSED PROJECT AND APPROVED PROJECT
(gross square feet)

Project	Commercial Retail (Square Feet)		Commercial Office (Square Feet)			Hotel		Green Space (square feet)	Multi-Family Residential (Dwelling Units)		Total
	Retail	Cinema	Corporate[1]	Professional[2]	Multi-tenant	Rooms	Square Feet		Units	Square Feet	Square Feet
Originally Proposed Project	220,000	50,000	535,600	21,840	0	150	100,000	0	608	930,000	1,857,440
Approved Project	198,500	48,000	471,000	21,840	0	0	0	47,916	608	714,729	1,454,069
New One Paseo Project	95,871	0	--	--	280,000	0	0	0	608	800,000	1,175,871
Net Change from Originally Proposed Project	**-124,129**	**-50,000**	**-535,600**	**-21,840**	**+280,000**	**-150**	**-100,000**	**0**	**0**	**-130,000**	**-681,569**
Net Change from Approved Project	**-102,629**	**-48,000**	**-471,000**	**-21,840**	**+280,000**	**0**	**0**	**-47,916**	**0**	**+85,271**	**-278,198**

[1] Corporate office category includes multi-tenant as well as corporate office uses.
[2] Professional office category was applied to multi-tenant office associated with Main Street.

IV. DETERMINATION:

The City previously prepared the One Paseo EIR (Project No. 193036; SCH No. 2010051073). Based on all available information in light of the entire record, the analysis in this Addendum, and pursuant to Section 15162 of the California Environmental Quality Act (CEQA) Guidelines, the City has determined the following:

A. There are no substantial changes to the project that will require major revisions to the One Paseo EIR due to new significant environmental impacts or a substantial increase in the severity of impacts identified in the One Paseo EIR.

B. Substantial changes have not occurred in the circumstances under which the project is being undertaken that will require major revisions of the One Paseo EIR to disclose new, significant environmental effects or a substantial increase in the severity of the impacts identified in the One Paseo EIR.

C. There is no new information of substantial importance not known at the time the One Paseo EIR was previously certified that shows any of the following:

   1. The project will have any new significant effects not discussed in the One Paseo EIR.

   2. There are impacts that were determined to be significant in the One Paseo EIR that will be substantially more severe than shown in the One Paseo EIR.

   3. There are additional mitigation measures or alternatives previously found not to be feasible that would substantially reduce one or more of the significant effects identified in the One Paseo EIR and the project proponent declines to adopt those measures or alternatives.

   4. There are additional mitigation measures or alternatives that were rejected by the project proponent that are considerably different from those analyzed in the One Paseo EIR that would substantially reduce any significant impact identified in the One Paseo EIR.

In accordance with Section 15164 of the CEQA Guidelines, some changes or additions to the One Paseo EIR are necessary, but none of the conditions described in Section 15162 calling for preparation of a new environmental document apply. Therefore, this Addendum to the previously certified One Paseo EIR is appropriate. No public review of this Addendum is required. The project site is not located in the Coastal Zone.

This Addendum to the One Paseo EIR includes an analysis to demonstrate that potential environmental impacts associated with the New One Paseo Project are consistent with the findings of the One Paseo EIR. In addition, certain mitigation measures associated with the Approved Project have been modified to reflect the impacts associated with the New One Paseo Project.

V. IMPACT ANALYSIS:

This environmental document serves as an Addendum to the previously certified One Paseo EIR, and provides project-specific environmental review for the New One Paseo Project pursuant to CEQA and the City's implementing procedures. The analysis of each major environmental issue includes a summary of the results and conclusions of the One Paseo EIR as well as applicable mitigation measures.

Based on the results and conclusions of the One Paseo EIR, this Addendum discusses the relationship of the New One Paseo Project to those results and conclusions in order to confirm that the One Paseo EIR would be applicable to the New One Paseo Project, and that the New One Paseo Project would not result in any new or more severe significant impacts than the projects analyzed in the One Paseo EIR. Revisions to the MMRP for the adopted One Paseo EIR to reflect the New One Paseo Project are included in Section VI of this Addendum.

Table 3 provides a summary of the relationship of the New One Paseo Project to the results and conclusions of the One Paseo EIR. As indicated in this table, the One Paseo EIR concluded that both the Originally Proposed and Approved Projects would result in direct significant impacts associated with Transportation/Circulation/Parking, Visual Effects and Neighborhood Character, Noise, Paleontological Resources, Biological Resources, Health and Safety, and Historical Resources, all of which would require mitigation. Significant cumulative impacts were determined to be associated with Transportation/Circulation/Parking. The One Paseo EIR concluded that significant impacts would be reduced to below a level of significance by mitigation measures with the exception of Transportation/Circulation/Parking (direct and cumulative) and Visual Effects and Neighborhood Character (direct).

In addition, the analysis contained in the One Paseo EIR concluded that the Originally Proposed Project and Approved Project would not have significant impacts related to Land Use, Air Quality, Energy, Greenhouse Gas Emissions, Hydrology/Water Quality, Public Utilities, and Public Services and Facilities/Recreation. Based on initial environmental review, the City determined that the Originally Proposed Project (and consequently the Approved Project) would not have the potential to cause significant adverse effects in the following areas: Agriculture and Forestry Resources, Geology and Soils, Mineral Resources, and Population and Housing.

Table 3 IMPACT ASSESSMENT SUMMARY					
Major Issue	**One Paseo EIR Impact Conclusion**	**One Paseo EIR Mitigation**	**New One Paseo Impact Conclusion**	**Impact Level Change with New One Paseo**	**New One Paseo EIR Mitigation Requirements**
Land Use	LS	None	LS	Decreased	None
Traffic	SNM	5.2-1 through 5.2-13[1]	SNM	Decreased	5.2-1 through 5.2-11
Parking	LS	None	LS	Decreased	None
Visual Effects and Neighborhood Character	SNM	None	SNM	Decreased	None
Noise	SM	5.4-1 through 5.4-4 and 12.9-1	SM	Decreased	5.4-1 through 5.4-4
Air Quality	LS	None	LS	Decreased	None
Energy	LS	None	LS	Decreased	None
Greenhouse Gas Emissions	LS	None	LS	Decreased	None
Paleontological Resources	SM	5.8-1	SM	No Change	5.8-1
Biological Resources	SM	5.9-1	SM	No Change	5.9-1
Hydrology/Water Quality	LS	None	LS	No Change	None
Public Utilities	LS	None	LS	Decreased	None
Public Services and Facilities/Recreation	LS	None	LS	Decreased	None
Health and Safety	SM	5.13-1 and 5.13-2	SM	No Change	5.13-1 and 5.13-2
Historical Resources	SM	5.14-1	SM	No Change	5.14-1

[1] It should be noted that there are a total of 14 mitigation measures.

LS Less than significant
SM Significant, mitigated
SNM Significant not mitigated

Land Use

Land Use Plans and Policies

One Paseo EIR

The One Paseo EIR determined that upon approval of the proposed land use plan amendments and rezone, the Originally Proposed and Approved Projects would be consistent with the land use designations and associated density of the Carmel Valley Community Plan and Precise Plan. Similarly, both projects would be consistent with the General Plan, with the exception of Policy ME-C.2 of the Mobility Element. The inability of the applicant and City to guarantee improvements which require approval from the California Department of Transportation (Caltrans) in a timely manner, prevented a finding that the project would meet this policy. However, the inability of the project to comply with only one of many policies of the General Plan was determined not to result in a significant land use policy impact.

Both projects were found to be consistent with other applicable land use policies and regulations including the 2050 Regional Transportation Plan (RTP) and Regional Comprehensive Plan (RCP), Marine Corps Air Station (MCAS) Miramar Airport Land Use Compatibility Plan (ALUCP), California State Implementation Plan (SIP), Water Quality Control Plan for the San Diego Basin (Basin Plan), Multiple Species Conservation Program (MSCP) Subarea Plan, California Green Building Standards Code, and floodplain zoning and regulations.

In summary, the One Paseo EIR concluded that land use policy impacts associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

New One Paseo Project

The New One Paseo Project would have similar overall land uses to the Originally Proposed Project and the Approved Project because the New One Paseo Project would retain the residential, retail and office uses, although the New One Paseo Project would eliminate the cinema and green space included in the Approved Project and the hotel included in the Originally Proposed Project. Office and retail space would be reduced, but the number of residential units would remain unchanged. The site plan will be reconfigured with the New One Paseo Project. As with the Originally Proposed and the Approved Projects, upon approval of the proposed land use plan, the New One Paseo Project would be consistent with the land use designations and associated density of the Carmel Valley Community Plan and Precise Plan.

As with the Originally Proposed and the Approved Projects, the New One Paseo Project is consistent with the General Plan, with the exception of Policy ME-C.2 of the Mobility Element. Neither the City ,nor the applicant can guarantee improvements which require approval from Caltrans in a timely manner, and therefore the City is unable to make a finding that the New One Paseo Project would meet this policy. However, the inability of the New One Paseo

Project to comply with only one of many policies of the General Plan would not result in a significant land use policy impact. Upon approval of the proposed land use plan, the New One Paseo Project would be consistent with the land use designations and associated density of the Carmel Valley Community Plan and Precise Plan.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to land use policy would be less than significant is applicable to the New One Paseo Project as well, and no mitigation measures are required. The New One Paseo Project would not result in any new land use impacts, nor substantially increase the severity of impacts beyond those described in the One Paseo EIR.

Urban Decay

One Paseo EIR

The One Paseo EIR determined that the demand for retail would exceed the supply with implementation associated with either the Originally Proposed or Approved Projects. As a result, the One Paseo EIR concluded that implementation of the Originally Proposed or Approved Projects would not result in urban decay resulting from physical changes in the environment due to existing retail uses closing from competition with future development of the project site.

In summary, the One Paseo EIR concluded that urban decay impacts associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation was required.

New One Paseo Project

An update to the Retail Market Analysis included in the One Paseo EIR was prepared for the New One Paseo Project, and is included as Appendix A to this Addendum (Kosmont Companies, 2015). The New One Paseo Project would reduce the retail square footage associated with the Originally Proposed and Approved Projects by approximately 56 and 52 percent, respectively. As a result, the New One Paseo Project would have less impact on the demand for retail in the area than the Originally Proposed or Approved Projects.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to urban decay would be less than significant would be applicable to the New One Paseo Project as well, and no mitigation measures are required. The New One Paseo Project would not result in any new urban decay impacts, nor substantially increase the severity of impacts beyond those described in the One Paseo EIR.

<u>Transportation/Circulation/Parking</u>

Traffic

<u>One Paseo EIR</u>

The One Paseo EIR concluded that the Originally Proposed and Approved Projects would impact the same transportation facilities, although traffic volumes would be less with the Approved Project. Specifically, the One Paseo EIR concluded that in the Existing Plus Project condition, the impacts of both projects on freeway segments and metered freeway ramps would be less than significant, but potentially significant direct impacts would occur along the following five roadway segments and one intersection:

Segments
- Del Mar Heights Road from the I-5 southbound (SB) ramps to the I-5 northbound (NB) ramps;
- Del Mar Heights Road from the I-5 NB ramps to High Bluff Drive;
- El Camino Real from Via de la Valle to San Dieguito Road; and
- Via de la Valle from San Andres Drive to El Camino Real (West).

Intersections
- Carmel Creek Road/Del Mar Trail in the AM peak hour.

In the Near-term With Project condition for both the Originally Proposed and Approved Projects with all three development phases, impacts to freeway segments and metered freeway ramps would be less than significant, and potentially significant direct impacts would occur along the following four roadway segments and four intersections:

Segments
- Del Mar Heights Road from the I-5 SB ramps to the I-5 NB ramps;
- Del Mar Heights Road from the I-5 NB ramps to High Bluff Drive;
- El Camino Real from Via de la Valle to San Dieguito Road; and
- Via de la Valle from San Andres Drive to El Camino Real (West).

Intersections
- Del Mar Heights Road/I-5 NB ramps in the PM peak hour;
- Del Mar Heights Road/High Bluff Drive in the PM peak hour;
- Del Mar Heights Road/El Camino Real in the PM peak hour; and
- Carmel Creek Road/Del Mar Trail in the AM peak hour.

In the Long-term Cumulative (Year 2030) With Project condition for both the Originally Proposed and Approved Projects, impacts to freeway segments would be less than significant, and potentially significant cumulative impacts would occur at two freeway ramp meters (the NB onramp and SB onramp at the Del Mar Heights Road/I-5 interchange), and the following three roadway segments and five intersections:

Segments

- Del Mar Heights Road from the I-5 NB ramps to High Bluff Drive;
- El Camino Real from Via de la Valle to San Dieguito Road; and
- Via de la Valle from San Andres Drive to El Camino Real.

Intersections

- Del Mar Heights Road/I-5 NB ramps in the AM/PM peak hours;
- Del Mar Heights Road/High Bluff Drive in the AM/PM peak hours;
- Del Mar Heights Road/El Camino Real in the PM peak hour;
- El Camino Real/SR 56 eastbound (EB) on-ramp in the PM peak hour; and
- Carmel Creek Road/Del Mar Trail in the AM peak hour.

As noted above, the One Paseo EIR concluded that the Approved Project would impact the same transportation facilities as the Originally Proposed Project; therefore, the mitigation measures identified for the Originally Proposed Project were determined to apply to the Approved Project. Mitigation Measures 5.2-1 through 5.2-13 are listed in Table 5.2-41, *Traffic Mitigation Summary*, of the One Paseo EIR. These mitigation measures include a variety of roadway improvements including restriping, widening, additional turn lanes and signalization.

The One Paseo EIR concluded that the mitigation measures for roadway segments would reduce traffic impacts of both the Originally Proposed and Approved Projects, but not to a less than significant level. Certain direct traffic impacts to roadway segments were concluded to remain significant because the construction of improvements could not be assured by either the applicant or the City in a timely manner. With regard to intersection impacts, the One Paseo EIR concluded that mitigation measures for Carmel Creek Road/Del Mar Trail, Del Mar Heights Road/High Bluff Drive, and Del Mar Heights Road/El Camino Real would reduce traffic impacts of the Originally Proposed and Approved Projects to a less than significant level. For all other intersections, however, the direct and cumulative impacts were concluded to remain potentially significant because the construction of improvements could not be assured by either the applicant or the City in a timely manner.

In addition, the One Paseo EIR concluded that construction traffic during the concurrent construction of Phases 1, 2, and 3 would result in a potentially significant direct impact to the roadway segment of Del Mar Heights Road between the I-5 NB ramps and High Bluff Drive due to the fact that combination of Phase 1 and 2 operational traffic with Phase 3 construction traffic would exceed the level of service (LOS) threshold by one average daily trip. This conclusion applied to both the Originally Proposed and Approved Projects. Mitigation Measure 5.2-13, which prohibited the concurrent construction of Phases 1, 2, and 3, although phases could overlap, was determined to provide adequate mitigation for the potential impacts from construction activities associated with the Originally Proposed and Approved Projects.

In summary, the One Paseo EIR concluded that traffic impacts associated with the Originally Proposed and Approved Projects would be significant and mitigation measures were identified. However, the One Paseo EIR concluded that certain traffic impacts would remain significant and not mitigated because construction of certain improvements could not be assured by either the applicant or the City in a timely manner.

<u>New One Paseo Project</u>

An update to the traffic studies included in the One Paseo EIR was prepared for the New One Paseo Project (Traffic Analysis Addendum), and is included as Appendix B to this Addendum (LLG, 2016). The updated traffic study determined that the total project trip generation for the New One Paseo Project would be 13,468 average daily trips (ADT) which represents an approximately 44 percent reduction in trips from the Approved Project (23,854 ADT), and an approximately 50 percent reduction in trips from the Originally Proposed Project 26,961 ADT).

Access to the site is proposed via two driveways on Del Mar Heights Road and four driveways on El Camino Real, similar to the project access scheme associated with the Originally Proposed and Approved Projects. However, access to the New One Paseo Project from Del Mar Heights Road would be taken from one signalized intersection and one right in/right out only driveway, as opposed to the two signal scheme on Del Mar Heights Road that was proposed with the Originally Proposed and Approved Projects. This access configuration was demonstrated to result in an acceptable level of service in the Traffic Analysis Addendum.

The Traffic Analysis Addendum concluded that with the New One Paseo Project, significant operational impacts would occur at each of the locations previously identified to be significantly impacted in the One Paseo EIR by the Originally Proposed and Approved Projects. Intersections and segments that were determined to have significant impacts with both the Originally Proposed and Approved Projects would also be impacted by the New One Paseo Project.

With the reduced traffic volumes, the Traffic Analysis Addendum concluded that the timing of several of the mitigation measures could be modified. Specifically, the Traffic Analysis Addendum notes that there would be no significant direct impact at the I-5 northbound on-ramp/Del Mar Heights Road intersection with buildout of the entire New One Paseo Project, only a long-term cumulative impact. Therefore none of the mitigation at this intersection would be needed until the occupation of the first office building.

The significant impact at the I-5 northbound on-ramp meter did not occur until project buildout for the Originally Proposed and Approved Projects. Since the total New One Paseo trip generation would be much lower, the mitigation is also not needed until the occupation of the first office building. The timing of the other original mitigation measures, i.e., prior to the first building permit for the project, remains applicable to the other New One Paseo Project mitigation measures.

In addition, with the reduction in traffic volumes, fair share amounts specified in the mitigation measures were proportionately reduced. These changes are reflected in the mitigation measures required for the New One Paseo Project included in the MMRP in Section VI at the end of this Addendum.

Although the Traffic Analysis Addendum concluded that the same intersections and segments would be impacted by the New One Paseo Project, the analysis concluded that the reduced traffic volumes would eliminate and/or modify the intersection improvements required of the Originally Proposed and Approved Projects. Specifically, the northbound right-turn lane at the intersection of Del Mar Heights Road and High Bluff Drive was determined unnecessary because the lower traffic generated by the new project negates the need for this turn lane. As a result, the original Mitigation Measure 5.2-6 has been eliminated from the MMRP.

The Traffic Analysis Addendum further determined that the addition of a third, northbound left-turn lane along with lengthening the eastbound, left-turn lane would adequately mitigate the impacts of the New One Paseo Project on the Del Mar Heights Road and High Bluff Drive intersection because the delay/LOS would be returned to pre-project levels. As a result, the improvements specified in the original Mitigation Measure 5.2-7 have been modified in the list of mitigation measures and would no longer include the addition of a second westbound left-turn lane or a second eastbound left turn lane.

The Traffic Analysis Addendum also concluded that the eastbound, right turn lane at the Del Mar Heights Road/El Camino Real intersection could be reduced from 365 to 200 feet due to the lower volumes generated by the New One Paseo project. The original Mitigation Measure 5.2-8 has been modified in the MMRP accordingly.

During discussions with the local community, interest was expressed in constructing a second westbound right-turn lane on Del Mar Heights Road to the northbound I-5 on-ramp rather than the original mitigation measure requirement to extend the existing right-turn lane by a distance of 845 feet. The Traffic Analysis Addendum looked at various options involving construction of a second right-turn lane to create dual right-turn lanes. One of the dual right-turn lane options involved both two right-turn lanes extending a distance of 300 feet to the western side of the AT&T building. The second option included one lane that would extend to the west side of the AT&T building and another that would extend a total of 470 feet to the east side of the AT&T building. In addition, an option to shorten the extension of the existing right-turn lane required by the original mitigation measure to 800 feet was also considered.

The Traffic Analysis Addendum concluded that either of the dual right-turn lane options would result in slightly lower average delays at the Del Mar Heights Road/I-5 northbound on-ramp intersection. However, the analysis also concluded that two right-turn lanes would be less effective than extending the existing right-turn lane by 845 feet because westbound traffic queued waiting for the traffic signal at the Del Mar Heights Road/I-5 northbound on-ramp intersection would be expected to extend easterly a distance of 810 feet during morning peak hour. As the dual right-turn lanes would not extend more than 470 feet from the intersection, westbound motorists wishing to access the turn lanes during the morning peak hour would not have free access to the turn lanes. Similarly, the third option of reducing the single right-turn lane to 800 feet would also interfere with access during peak hour periods. Conversely, the extension of the existing turn lane required by the original mitigation measure by 845 feet would promote turn lane access. The extension of the single right-turn lane by 845 feet or the provision of dual right-turn lanes with one lane extending to the east side of the AT&T building will improve traffic operations.

In response to the community interest in dual right-turn lanes on Del Mar Heights Road at the I-5 on-ramp, and the conclusion of the Traffic Analysis Addendum that a dual-lane option would result in a reduction in impact similar to the extended right-turn lane, Mitigation Measure 5.2-2 has been modified in the MMRP to require two right-turn lanes, one of which would extend to the west side of the AT&T building and the other, would extend to the east side of the AT&T building.

With respect to construction traffic impacts, the Traffic Analysis Addendum concluded that construction traffic related to the New One Paseo Project would not create a significant impact. The Traffic Analysis Addendum demonstrated that the daily trip generation expected due to construction would be lower than the Originally Proposed and Approved Projects due the reduction in grading export material. Based on the reduced export, construction traffic with the New One Paseo Project would be 1,735 daily trips, which is 40 trips less than that forecasted for the Originally Proposed and Approved Projects. In the original traffic analysis, a significant impact resulted on Del Mar Heights Road because, with the construction traffic, the ADT was 55,001, one trip over the significance threshold. Since the amount of construction trips will be less with the New One Paseo Project, no significant construction impact would result and no limitations on construction phasing are warranted. As a result, original Mitigation Measure 5.2-13 has been eliminated from the MMRP.

As with the Originally Proposed and Approved Projects, the New One Paseo Project would have significant, unmitigated impacts on certain roadway segments and intersections because the implementation of some of the roadway improvements cannot be assured by the applicant or the City in a timely manner.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to traffic would be significant and unmitigated is also applicable to the New One Paseo Project. With the exception of Mitigation Measures 5.2-6 and 5.2-13, mitigation measures identified for the Originally Proposed and Approved Projects would be applicable to the New One Paseo Project, although several of the mitigation measures would be modified, as described earlier. No new mitigation measures are required. As the New One Paseo Project would substantially reduce traffic generated by development of the site, the New One Paseo Project would not result in any new traffic impacts, nor substantially increase the severity of impacts beyond those described in the One Paseo EIR.

Parking

<u>One Paseo EIR</u>

The One Paseo EIR determined that the Originally Proposed Project's projected buildout peak weekday parking demand of 3,882 spaces and weekend demand of 2,642 spaces would not exceed the proposed supply of 4,089 parking spaces. The Approved Project would provide approximately 3,688 parking spaces throughout the site upon buildout of the project. For the Approved Project, demand would be less than the Originally Proposed Project because of the elimination of the hotel and reduction in overall gross leasable area, including office space and retail. The projected peak parking demand for the Approved Project would be 3,520 spaces. This would be less than the proposed supply of 3,688 spaces.

In summary, the One Paseo EIR concluded that parking impacts associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation was required.

<u>New One Paseo Project</u>

An update to the Shared Parking Analysis included in the One Paseo EIR was prepared for the New One Paseo Project (Shared Parking Addendum), and is included as Appendix C of this Addendum (Walker Parking Consultants, 2016). The New One Paseo Project would provide approximately 2,747 parking spaces, which is approximately 941 fewer spaces than the Approved Project. The Shared Parking Addendum concluded that the New One Paseo Project would generate a peak parking demand of 2,587 spaces. A total of 2,747 spaces would be provided by the New One Paseo Project. Thus, the supply would exceed the demand by 160 spaces.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to parking would be less than significant and that no mitigation measures were required would be applicable to the New One Paseo Project as well. The New One Paseo Project would not result in any new parking impacts, nor substantially increase the severity of impacts beyond those described in the One Paseo EIR.

Air Traffic Safety

<u>One Paseo EIR</u>

The One Paseo EIR determined that the project site is not located within the airport influence area or any designated overflight, safety, or noise contour identified in the MCAS Miramar ALUCP. The project site is not located within the contour boundaries for Federal Aviation Administration (FAA) height notification, Federal Aviation Regulations Part 77 obstruction surfaces, a High Terrain Zone, or the Airspace Protection Compatibility Area in the ALUCP's airspace protection map. As such, the One Paseo EIR determined that neither the Originally Proposed Project, nor the Approved Project would result in airspace obstruction or affect air traffic patterns.

In summary, the One Paseo EIR concluded that air traffic safety impacts associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

New One Paseo Project

The New One Paseo Project would be in the same location as the Originally Proposed and Approved Projects, so the New One Paseo Project is not in the vicinity of any public or private airport or any area subject to FAA regulations.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to air traffic safety would be less than significant would be applicable to the New One Paseo Project, and no mitigation measures are required. The New One Paseo Project would not result in any new air traffic impacts, nor substantially increase the impacts beyond those described in the One Paseo EIR.

Traffic Hazards

One Paseo EIR

The access design of the Originally Proposed and Approved Projects were found to be generally in compliance with the City's Street Design Manual. Consequently, the One Paseo EIR concluded that the development would not create vehicular/pedestrian and bicyclist conflicts, and would provide adequate visibility. A Sight Visibility Report prepared for the Originally Proposed and Approved Project concluded that sufficient sight distance would exist at the four driveways located along the inside of a curve on El Camino Real with appropriate sight visibility easements.

In summary, the One Paseo EIR concluded that traffic hazard impacts associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

New One Paseo Project

The New One Paseo Project would have a similar access design as the Originally Proposed and Approved Projects, with the exception that only one signalized access driveway will be provided on Del Mar Heights Road. The New One Paseo Project's access design would continue to be in compliance with the City's Street Design Manual, would not create vehicular/pedestrian and bicyclist conflicts, and would provide adequate visibility. An update to the Sight Visibility Report included in the One Paseo EIR was prepared for the New One Paseo Project (Updated Sight Visibility Report) and is included as Appendix D of this Addendum (Leppert Engineering, 2015a). The Updated Sight Visibility Report concluded that sufficient sight distance would exist at the four driveways located along the inside of a curve on El Camino Real with appropriate sight visibility easements.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to traffic hazards would be less than significant is applicable to the New One Paseo Project as well, and no mitigation measures are required. The New One Paseo Project would not result in any new traffic hazards impacts, nor increase the severity of impacts beyond those described in the One Paseo EIR.

Emergency Access

One Paseo EIR

The One Paseo EIR determined that the Originally Proposed Project would provide adequate emergency access within the site, by preparing a fire access plan, posting fire lane signage along the roadways, and providing additional emergency requirements such as fire hydrants in accordance with City requirements. In addition, the signalized access driveways (at Del Mar Heights Road/First Avenue, Del Mar Heights Road/Third Avenue, and El Camino Real/Market Street) would be equipped with signal pre-emption devices to assist emergency vehicles. The Approved Project included the same emergency features.

In summary, the One Paseo EIR concluded that emergency access impacts associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

New One Paseo Project

The New One Paseo Project would provide the same emergency access features as the Originally Proposed and Approved Projects, including preparing a fire access plan, posting fire lane signage along the roadways, and providing additional emergency requirements such as fire hydrants in accordance with City requirements. The only change between the Originally Proposed and Approved Projects and the New One Paseo Project would be the elimination of one signalized intersection at the Del Mar Heights Road access points. Changing that driveway to a right-in/ right-out only driveway was shown to operate acceptably in the updated Traffic Analysis Addendum in Appendix B, and would not be expected to substantially disrupt traffic flow along Del Mar Heights Road. Therefore, changing this driveway would not impact emergency vehicle access.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to emergency access would be less than significant would be applicable to the New One Paseo Project as well, and no mitigation measures are required. The New One Paseo Project would not result in any new emergency access impacts, nor substantially increase the severity of impacts beyond those described in the One Paseo EIR.

Multi-Modal Transportation Facilities

One Paseo EIR

The One Paseo EIR determined that the Originally Proposed and Approved Projects would not impact alternative transportation modes, and would support pedestrian and bicycle transportation, as well as carpooling and future planned transit operations in the Carmel Valley community. The shuttle proposed by the project’s Transportation Demand Management Plan providing transportation to the Solana Beach Transit Center was found to provide access to regional transportation until planned bus service to the site is implemented. Thus, the Originally Proposed and Approved Projects were found to be consistent with the City's alternative transportation policies.

In summary, the One Paseo EIR concluded that multi-modal transportation facilities impacts associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

New One Paseo Project

The New One Paseo Project would have a similar multi-modal facility design as the Originally Proposed and Approved Projects, including pedestrian and bicycle facilities that would connect to the existing pedestrian and bicycle network. As with the Originally Proposed and Approved Projects, a shuttle is proposed to provide transportation to a nearby transit station to provide access to regional transportation until public transit service is available to serve the project or within close proximity. With the New One Paseo Project, shuttle service would be provided to the Solana Beach Transit Center.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to multi-modal transportation facilities would be less than significant would be applicable to the New One Paseo Project as well, and no mitigation measures are required. The New One Paseo Project would not result in any new impacts related to multi-modal transportation facilities, nor substantially increase the severity of impacts beyond those described in the One Paseo EIR.

Visual Effects and Neighborhood Character

Scenic Vistas and Resources

One Paseo EIR

The One Paseo EIR determined that there are no designated viewpoints, view corridors, scenic routes, or scenic vistas on site or in the project vicinity. The Originally Proposed and Approved Projects are located in a developed neighborhood surrounded by office, residential, and retail development with no substantial scenic resources. The site is graded and vacant, and does not contain any substantial scenic resources or natural landforms that could be considered important visual resources. Although street trees along the perimeter of the site and along the extension of the right-turn lane from Del Mar Heights Road to the I-5 NB onramp would be removed, these trees were not considered significant visual resources.

In summary, the One Paseo EIR concluded that scenic vista and resources impacts associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

New One Paseo Project

The New One Paseo Project would be in the same location and have a similar grading and development plan as for Originally Proposed Project and the Approved Project, although the New One Paseo Project would have less density and intensity. Existing trees around the perimeter of the site and along the right-turn lane along Del Mar Heights Road to the I-5 NB ramp would be impacted, similar to the Originally Proposed Project and the Approved Project. The visual effect of constructing a second westbound right-turn lane would be comparable to the extension of the existing right-turn lane required by the original Mitigation Measure 5.2-2. Both approaches would impact trees but, as discussed in the One Paseo EIR, the trees in this area are not considered significant visual resources.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to scenic vistas and resources would be less than significant would be applicable to the New One Paseo Project as well, and no mitigation measures are required. The New One Paseo Project would not result in any new impacts related to scenic vistas and resources, nor substantially increase the severity of impacts beyond those described in the One Paseo EIR.

Visual Quality and Neighborhood Character

One Paseo EIR

The Originally Proposed Project included buildings ranging between one and 11 stories. One of the office buildings along El Camino Real included 11 stories. A 10-story residential building was proposed at the northwest corner of the site. The remainder of the residential development along Del Mar Heights Road ranged between 4 and 5 stories. The Approved Project reduced the office buildings to a maximum of 9 stories and eliminated the 10-story residential building. In both projects, retail development was located in the central portion of the development.

The analysis in the One Paseo EIR determined that the building heights and intensity of use associated with the Originally Proposed and Approved Projects, as a whole, would be out of character with the bulk and scale of the surrounding neighborhood. The One Paseo EIR concluded that the Originally Proposed and Approved Projects would have a significant impact on neighborhood character, and feasible mitigation measures were not available to reduce this impact to below a level of significance.

In summary, the One Paseo EIR concluded that impacts to neighborhood character associated with the Originally Proposed and Approved Projects would be significant, and that there were no feasible mitigation measures to reduce this impact to below a level of significance. Neighborhood character impacts were found to be significant and unmitigable.

New One Paseo Project

The New One Paseo Project would reduce the bulk and scale of the proposed project with respect to both the Originally Proposed and Approved Projects. As discussed earlier, the overall square footage would be reduced. When compared with the Approved Project, the New One Paseo Project would be reduced by 19 percent from 1,454,069 to 1,175,871 gsf. The office space would be reduced by 43 percent, while the retail component would be reduced by approximately 52 percent. The office buildings along El Camino Real would be reduced to 6 stories in one of the buildings, and four stories in the other. The office buildings would also be set back, and above grade from El Camino Real. The residential development along Del Mar Heights Road would be situated at the northwest corner, and would remain at four to five stories along the street, but would increase to six stories in the central portion of the development. Additional landscape setbacks would be included along Del Mar Heights Road. The northeast corner of the site would be used for a parking structure that would be located no more than 5 feet above the grade of Del Mar Heights Road; landscaping would be used between the structure and the road to reduce visual impacts. As with the Originally Proposed and Approved Projects, the retail component would be centrally located.

The impacts of constructing a second westbound right-turn lane at the Del Mar Heights Road/I-5 northbound on-ramp intersection on visual and neighborhood quality would be less than the extension of the existing right-turn lane required by the original mitigation measure due to the reduced length and height of the required retaining walls. Extension of the existing right-turn lane would require approximately 600 linear feet of retaining walls ranging from 2 to 9 feet in height. The dual right-turn lane configuration would involve approximately 500 linear feet of retaining walls ranging between 2 to 3 feet in height. The dual-right turn lane configuration would restrict the disturbance to the area west of and in front of the AT&T building while the extended single right-turn lane would extend approximately 350 feet east of the AT&T building, resulting in less visual and neighborhood quality impacts than with the original mitigation measure.

Although the bulk and scale of the New One Paseo Project would be substantially reduced from that of the Originally Proposed and Approved Projects, the size of the project would represent a departure from the existing conditions and surrounding uses. Thus, while reduced in magnitude, the New One Paseo Project would, nonetheless, have a significant impact on visual quality and neighborhood character.

In summary, the conclusion in the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to neighborhood character would be significant is applicable to the New One Paseo Project as well. However, the New One Paseo Project would not result in any new visual quality and neighborhood character impacts, nor substantially increase the severity of the impacts beyond those described in the One Paseo EIR.

Visual Appearance

<u>One Paseo EIR</u>

The One Paseo EIR determined that: (1) the Originally Proposed and Approved Projects were designed to integrate with the surrounding visual environment and development patterns, (2) Originally Proposed and Approved Project elements would provide for an organized and visually diverse development, and (3) architectural treatments would provide for visual interest and reduce perceived scale and massing effects. Proposed retaining walls were found to not be highly visible from public viewpoints and would be architecturally treated and landscaped to screen and integrate them into the overall project design.

In summary, the One Paseo EIR concluded that visual appearance impacts associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

New One Paseo Project

The New One Paseo Project would be in the same location and have a similar level of development as the Originally Proposed Project and the Approved Project, although with less density and at a reduced scale. The New One Paseo Project would have similar development patterns, project elements, architectural treatments, and landscaping. As discussed earlier, construction of a second westbound right-turn lane on Del Mar Heights Road at the I-5 northbound on-ramp would have less visual impact than extending the existing right-turn lane due to the reduction in retaining wall length and height.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to visual appearance would be less than significant is applicable to the New One Paseo Project as well and no mitigation measures are required. The New One Paseo Project would not result in any new visual appearance impacts, nor substantially increase the severity of the impacts beyond those described in the One Paseo EIR.

Light, Glare, and Shading

One Paseo EIR

The One Paseo EIR determined that outdoor lighting would be consistent with the outdoor lighting in the surrounding area of the site, and the Originally Proposed and Approved Projects would be required to comply with the City's Outdoor Lighting Regulations. The One Paseo EIR acknowledged impacts would be further reduced by the fact that most of the proposed buildings would consist of less than 50 percent of potentially reflective materials, and exterior cladding materials on the office structures would meet or exceed the 30 percent light reflectivity factor requirement. In addition, the One Paseo EIR concluded that shading impacts on adjacent residential development would not be significant.

In summary, the One Paseo EIR concluded that light, glare, and shading impacts associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

New One Paseo Project

The New One Paseo Project would reduce the shading impacts on the neighborhood to the north. Most notably, the placement of the parking structure in the northeast corner of the property would reduce shadow impacts because unlike the 5-story residential buildings associated with the Approved Project, the parking structure would only rise five feet above the grade of Del Mar Heights Road. Also, although comparable in height to the Approved Project, the remaining residential buildings along Del Mar Heights Road would be setback farther from the street which would reduce shadow impacts to the north.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to light, glare, and shading would be less than significant would be applicable to the New One Paseo Project as well, and no mitigation measures are required. The New One Paseo Project would not result in any new light, glare and shading impacts, nor substantially increase the severity of the impacts beyond those described in the One Paseo EIR.

Noise

On-Site Noise

One Paseo EIR

On-site Noise Sources

The analysis in the One Paseo EIR determined that on-site noise sources would be associated with the proposed retail activities and construction activities. The retail uses associated with both the Originally Proposed and Approved Projects included stationary noise sources related to refrigeration and freezer condensers (associated with markets and restaurants), trash compactors, forklifts, delivery trucks, amplification systems (nighttime entertainment), restaurant kitchen fans, heating, ventilation and air conditioning equipment, and parking lot traffic. Although the precise nature and placement of those uses were unknown, and thus, specific modeling with respect to onsite development was not possible at that time, the uses were found to potentially expose on-site residents to noise levels in excess of City noise criteria. The One Paseo EIR included Mitigation Measures 5.4-1 and 5.4-3, which required acoustical studies of stationary noise sources and incorporation of noise attenuation measures to assure that stationary noise sources do not exceed limits imposed by the City's Noise Control Ordinance.

Off-site Noise Sources

The analysis in the One Paseo EIR determined that the Originally Proposed and Approved Projects would include land uses that would be sensitive to traffic noise. Noise-sensitive receptors included habitable rooms within residential units, usable public and private outdoor recreation areas, and office buildings. Greenbelt areas and residential front porches were not considered noise sensitive because they are not occupied for prolonged periods of time. The analysis concluded that project-related traffic on nearby roadways would not result in a substantial increase in the traffic noise experienced by adjacent noise sensitive uses.

Traffic noise along Del Mar Heights Road and El Camino Real was determined to exceed 65 decibels on the A-weighted scale (dBA) Community Noise Equivalent Level (CNEL). As a result, proposed residences and office uses along these roadways would be adversely impacted by traffic noise. The Originally Proposed and Approved Projects included public and private usable outdoor areas that would be exposed to unacceptable traffic noise. Usable public areas included the recreation area in the northwest corner of Block C of the Approved Project, a pool area between Buildings 4 and 5 in Block B, and a second-floor gathering area in Building 3 of Block A.

Mitigation Measure 5.4-2 included in the One Paseo EIR required acoustical studies for noise sensitive uses (e.g., residential and office) that would be exposed to unacceptable traffic noise levels. The mitigation required noise attenuation (e.g., barriers, dual pane windows, insulation, etc.) be included in buildings to reduce interior noise levels to 45 CNEL or less. An additional noise mitigation measure (Mitigation Measure 12.9-1) was developed specifically for the Approved Project that would require noise attenuation via a sound wall to protect the proposed green space from noise levels in excess of 65 CNEL.

In summary, the One Paseo EIR concluded that impacts related to on-site and off-site noise levels associated with the Originally Proposed and Approved Projects would be significant, and the identified mitigation measures would reduce impacts to less than significant.

<u>New One Paseo Project</u>

On-site Noise Sources

An update to the acoustical analysis included in the One Paseo EIR was prepared for the New One Paseo Project (Updated Acoustical Report) and is included as Appendix E to the Addendum (HELIX, 2015). The Updated Acoustical Report concluded that the New One Paseo Project would have similar stationary noise sources (e.g., roof top equipment and construction) as the Originally Proposed and the Approved Projects.

Similar to the Originally Proposed and Approved Projects, implementation of Mitigation Measures 5.4-1 through 5.4-3 would reduce potential on-site noise impacts for the New One Paseo Project to less than significant levels. Since the on-site green space included in the Approved Project has been eliminated, on-site noise impacts on public recreational areas would be avoided. Based on the updated project design, Mitigation Measure 12.9-1 would no longer be necessary to mitigate significant on-site noise impacts.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to on-site stationary sources would be less than significant with mitigation incorporated would remain applicable to the New One Paseo Project as well. Mitigation Measure 12.9-1 would be deleted as discussed above and no new mitigation is required. The New One Paseo Project would not result in any new on-site noise impacts, nor substantially increase the severity of the impacts beyond those described in the One Paseo EIR.

Off-site Noise Sources

The updated noise analysis concluded that, as with the Originally Proposed and Approved Projects, noise sensitive uses (e.g. residential and office) proposed along Del Mar Heights Road and El Camino Real would be exposed to unacceptable traffic noise levels. Usable public areas included within proposed residential development could also be exposed to unacceptable noise levels. However, as with the Originally Proposed and Approved Projects, implementation of noise attenuation required by Mitigation Measure 5.4-2 would reduce off-site traffic noise impacts to acceptable levels.

As with the Originally Proposed and Approved Projects, traffic added by the New One Paseo Project to nearby roadways would not result in a substantial increase in traffic noise levels experienced by adjacent noise sensitive land uses.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to traffic noise impacts to on-site noise-sensitive uses would be less than significant with mitigation incorporated would remain applicable to the New One Paseo Project as well. The New One Paseo Project would not result in any new on-site noise impacts, nor substantially increase the severity of the impacts beyond those described in the One Paseo EIR.

Transportation Noise Levels

<u>One Paseo EIR</u>

On-site Traffic Noise Receptors

As discussed earlier, the One Paseo EIR determined that traffic noise would potentially expose on-site residences and offices to interior noise levels above the traffic noise significance thresholds, resulting in a potentially significant traffic noise impact. Under the Approved Project, potentially significant traffic noise impacts on green space users were also identified. Implementation of Mitigation Measure 5.4-2 and Mitigation Measure 12.9-1, identified in the One Paseo EIR, would reduce potentially significant traffic noise impacts to below a level of significance. Mitigation Measure 5.4-2 was required for both the Originally Proposed and Approved Projects while Mitigation Measure 12.9-1 was only required for the Approved Project to protect people using the green space area included in the northwest corner of the project.

In summary, the One Paseo EIR concluded that impacts from traffic noise to on-site receptors associated with the Originally Proposed and Approved Projects would be significant, and the identified mitigation measures would reduce impacts to less than significant.

Off-site Traffic Noise Receptors

The One Paseo EIR concluded that traffic noise impacts to off-site uses resulting from the Originally Proposed or Approved Project would be less than significant because traffic noise is already above acceptable levels and the additional noise related to Originally Proposed or Approved Project traffic on adjacent roadways would not increase traffic noise levels beyond the 3 dBA level normally considered perceptible by the human ear.

In summary, the One Paseo EIR concluded that noise impacts to off-site receptors associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

New One Paseo Project

On-site Traffic Noise Receptors

Although the New One Paseo Project would contribute less traffic to Del Mar Heights Road and El Camino Real, traffic noise from these roadways would still have a potentially significant impact on adjacent residential and office uses within the New One Paseo Project. As with the Originally Proposed and Approved Projects, implementation of Mitigation Measure 5.4-2 would reduce traffic noise impacts to onsite uses to a less than significant level. As discussed above, with the elimination of the green space from the New One Paseo Project, Mitigation Measure 12.9-1 would no longer be necessary to mitigate the on-site traffic noise impacts on green space users.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to on-site traffic noise receptors would be less than significant with mitigation incorporated would remain applicable to the New One Paseo Project as well. The New One Paseo Project would not result in any new traffic noise impacts on on-site receptors, nor substantially increase the severity of the impacts beyond those described in the One Paseo EIR.

Off-site Traffic Noise Receptors

As the New One Paseo Project would reduce the amount of traffic added to local roadways in comparison to the Originally Proposed and Approved Projects, the impact of the New One Paseo Project traffic on traffic noise levels along these roadways would remain less than significant.

With construction of a second westbound right-turn lane on Del Mar Heights Road at the I-5 NB on-ramp, traffic noise would be located approximately 12 feet closer to residences to the north than with the single right-turn lane configuration. However, the closer proximity would not significantly impact the nearby residences because the residences already have a noise wall along Del Mar Heights Road, and the residences would be located approximately 15 feet above the proposed new turn lane. The existing noise wall and elevation difference would combine to negate any impacts from the reduced distance between the residences and the nearest right-turn lane.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to off-site traffic noise receptors would be less than significant would remain applicable to the New One Paseo Project as well. No new mitigation measures are required. The New One Paseo Project would not result in any new traffic noise impacts on off-site receptors, nor substantially increase the severity of the impacts beyond those described in the One Paseo EIR.

Construction Noise

One Paseo EIR

The One Paseo EIR determined that construction noise levels generated by the Originally Proposed Project would not exceed limits allowed by the City's Noise Control Ordinance at off-site sensitive receptors. Construction during Phase 3 however, was determined to potentially generate noise levels above the 12-hour average of 75 dBA at the adjacent on-site residences that would be constructed in earlier phases. The One Paseo EIR concluded that the construction noise impacts for the on-site sensitive receptors would be considered potentially significant during construction of Phase 3. Implementation of Mitigation Measure 5.4-4 identified in the One Paseo EIR would reduce construction noise impacts to below a level of significance. This conclusion also applied to the Approved Project, which would have similar although less intensive development and generate similar noise levels during construction of all three phases.

In summary, the One Paseo EIR concluded that construction noise impacts during construction of Phase 3 of the Originally Proposed and Approved Projects would be significant, and the mitigation identified in the One Paseo EIR would reduce these impacts to a less than significant level.

New One Paseo Project

The New One Paseo Project would have similar but less intensive development than the Originally Proposed and Approved Projects. Nevertheless, it would generate similar noise levels during construction. Thus, the noise impacts associated with the New One Paseo Project could also potentially impact adjacent residential uses within the project if excavation activities occur within 100 feet of residential uses. If that occurs, construction noise impacts would be considered potentially significant. However, similar to the Originally Proposed Project and the Approved Project, implementation of Mitigation Measure 5.4-4 would reduce potential impacts to below a level of significance. Due to the different site plan, Mitigation Measure 5.4-4 has been simplified from the Originally Proposed and Approved Projects to provide a more general performance standard.

In summary, the conclusion of the One Paseo EIR that construction noise impacts during construction of the Originally Proposed and Approved Projects would be less than significant with mitigation incorporated would remain applicable to the New One Paseo Project as well. No new mitigation measures would be required. The New One Paseo Project would not result in any new construction noise impacts, nor substantially increase the severity of the impacts beyond those described in the One Paseo EIR.

<u>Air Quality</u>

Air Quality Plan Consistency

<u>One Paseo EIR</u>

The analysis for the Originally Proposed and Approved Projects in the One Paseo EIR determined that although the Originally Proposed and Approved Projects would require a CPA and PPA to allow for the proposed land uses, construction or operational air emissions generated by either the Originally Proposed or Proposed Project would not exceed applicable significance thresholds for ozone precursors or particulate matter. For both the Originally Proposed Project and the Approved Project, design features were proposed to reduce project emissions in compliance with the strategies in the Regional Air Quality Strategy (RAQS) and Statewide Implementation Plan (SIP) for attaining and maintaining air quality standards. The Originally Proposed and Approve Projects, therefore, were determined to not conflict with the RAQS or the SIP.

In summary, the One Paseo EIR concluded that air quality plan consistency impacts associated with the Originally Proposed and the Approved Projects would be less than significant. Consequently, no mitigation measures were required.

<u>New One Paseo Project</u>

An update to the air quality analysis included in the One Paseo EIR was prepared for the New One Paseo Project (Updated Air Quality Analysis) and is included as Appendix F to this Addendum (HELIX 2015b). This Updated Air Quality Analysis concluded that the New One Paseo Project would result in less air quality impacts due to the 37 percent decrease in overall gsf when compared to the Originally Proposed Project, and 19 percent decrease in overall gsf when compared to the Approved Project.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to air quality plan consistency would be less than significant would be applicable to the New One Paseo Project as well, and no mitigation measures are required. The New One Paseo Project would not result in any new air quality plan consistency impacts, nor substantially increase the severity of impacts beyond those described in the One Paseo EIR.

Air Quality Criteria Pollutants

<u>One Paseo EIR</u>

The analysis for the Originally Proposed and Approved Projects in the One Paseo EIR concluded that the emissions associated with construction activities of all three analyzed construction phasing scenarios would be below the daily thresholds during each construction year. Furthermore, due to the fact that the construction phases of the Originally Proposed and Approved Projects are temporary, construction was found to not result in emissions that would violate any air quality standard or contribute substantially to an existing or projected air quality violation.

The analysis for the Originally Proposed and Approved Projects concluded that daily operational emissions would not exceed the thresholds for all criteria pollutants. Therefore, operations were determined to not result in significant air quality impacts related to criteria pollutants. In addition, quantitative analysis included in the appendices to the One Paseo EIR determined that air quality impacts associated with concurrent construction and operational emissions due to project phasing were less than significant. The analysis for the Approved Project concluded that due to the reduced square footage, the Approved Project would reduce ADT by approximately 13 percent when compared to the Originally Proposed Project, as well as reduce the demand for energy. As such, it was determined that the Approved Project would result in lower emissions of criteria pollutants than the Originally Proposed Project.

In summary, the One Paseo EIR concluded that construction and operational pollutant emissions impacts associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

<u>New One Paseo Project</u>

The Updated Air Quality Analysis determined that the construction area activity would be essentially unchanged for the New One Paseo Project. As such, emissions associated with construction of the New One Paseo Project would be comparable to the Originally Proposed Project and Approved Project.

The Updated Air Quality Analysis also determined that during operation, the New One Paseo Project would result in less mobile-source emissions due to the reduction of approximately 43 percent in ADT when compared to the Approved Project, and approximately 50 percent when compared to the Originally Proposed Project. Furthermore, the New One Paseo Project would result in reduced energy demand due to the reduced square footage. As such, the New One Paseo Project would result in lower emissions of criteria pollutants than either the Originally Proposed Project or the Approved Project.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to construction and operational pollutant emissions would be less than significant would be applicable to the New One Paseo Project as well, and no mitigation measures are required. The New One Paseo Project would not result in any new environmental impacts for air quality pollutants, nor substantially increase the severity of impacts beyond those described in the One Paseo EIR.

Toxic Air Contaminants

<u>One Paseo EIR</u>

The One Paseo EIR determined that construction activities related to both the Originally Proposed and Approved Projects would not result in significant air quality impacts related to diesel particulate matter because temporary construction durations would be far less than the lifetime risks from chronic exposure to diesel particulate matter, and naturally occurring asbestos is not expected to be encountered on the project site during construction of the Originally Proposed or Approved Projects.

The analysis for the Originally Proposed and Approved Projects in the One Paseo EIR concluded that operations would not result in significant levels of toxic air contaminants (TACs) related to diesel particulates and heating and ventilation associated with operations of the proposed development.

In summary, the One Paseo EIR concluded that TAC impacts associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

<u>New One Paseo Project</u>

The Updated Air Quality Analysis determined that the construction equipment used for the New One Paseo Project would be similar to the Originally Proposed and Approved Projects, and as such, the diesel particulates generated from the New One Paseo Project would be comparable to the Originally Proposed Project and the Approved Project, which were considered to have a less than significant impact.

The Updated Air Quality Analysis also determined that the reduced square footage of the New One Paseo Project would result in a proportional reduction in operational TACs and diesel particulate emissions in comparison with the Originally Proposed Project and the Approved Project.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects, with respect to TACs, would be less than significant would be applicable to the New One Paseo Project as well, and no mitigation measures are required. The New One Paseo Project would not result in any new TACs impacts, nor substantially increase the severity of impacts beyond those described in the One Paseo EIR.

Objectionable Odors

<u>One Paseo EIR</u>

The One Paseo EIR determined that the only source of odor anticipated from Originally Proposed or Approved Project construction would be exhaust emissions from the diesel equipment and haul trucks. However, these odors would be short-term.

The One Paseo EIR determined that the land uses associated with the Originally Proposed and Approved Project would not generate significant odors. While restaurants would generate some odor, the One Paseo EIR concluded that they would not be considered objectionable by the local residents.

In summary, the One Paseo EIR concluded that odor impacts during construction and operation associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

New One Paseo Project

The Updated Air Quality Analysis determined that construction equipment usage would be similar to the Originally Proposed and Approved Projects. As with the Originally Proposed and Approved Projects, construction equipment odors would be short-term.

The Updated Air Quality Analysis also determined that potential odor generating land uses would be similar to the Originally Proposed and Approved Projects. As with the Originally Proposed and Approved Projects, odors associated with restaurants and other activities would not be considered objectionable by future residents.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to odors during construction and operation would be less than significant would be applicable to the New One Paseo Project as well, and no mitigation measures are required. The New One Paseo Project would not result in any new environmental impacts from objectionable odors, nor substantially increase the severity of impacts beyond those described in the One Paseo EIR.

Energy

One Paseo EIR

The One Paseo EIR determined that construction of the Originally Proposed and Approved Projects would incorporate on-site energy conservation and demand-side management features. The One Paseo EIR also took into account the fact that construction would be required to comply with all applicable local, state, and federal regulatory requirements regarding energy conservation.

The One Paseo EIR also determined that upon implementation of the proposed energy-related project design features, the Originally Proposed and Approved Projects would reduce energy demand in compliance with local, state, and federal regulations. The Originally Proposed and Approved Projects were determined to not conflict with any adopted energy conservation plans, and not require new sources of energy.

In summary, the One Paseo EIR concluded that energy impacts associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

New One Paseo Project

Similar to the Originally Proposed Project and the Approved Project, the New One Paseo Project would incorporate on-site energy conservation and demand-side management features during construction including energy efficient lighting, limitation on night lighting, and the use of cool roof materials for the office buildings. Also, the New One Paseo Project would reduce its energy demand in compliance with local, state, and federal regulations during operations. Consequently, the New One Paseo Project would not conflict with any adopted energy conservation plans, and would not require new sources of energy.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to energy for construction and during operations would be less than significant would also be applicable to the New One Paseo Project, and no mitigation measures are required. The New One Paseo Project would not result in any new energy related environmental impacts, nor substantially increase the severity of impacts beyond those described in the One Paseo EIR.

Greenhouse Gas Emissions

Greenhouse Gas Emission Levels

One Paseo EIR

The analysis for the Approved Project in the One Paseo EIR concluded that the generation of greenhouse gas (GHG) emissions during construction would be comparable to that of the Originally Proposed Project because the emission levels are based on the surface area to be graded and the number of pieces of construction equipment operating at any given time. These factors would remain essentially unchanged between the Originally Proposed Project and the Approved Project.

In the One Paseo EIR, GHG emissions were quantified for both construction and operation of the Originally Proposed Project. GHG emissions generated during construction of the Originally Proposed Project would be temporary and limited to the construction phases of the Originally Proposed Project. Amortized over 30 years, the proposed construction activities under all three analyzed construction phasing scenarios were determined to be less than the City's 900 metric tons screening threshold.

In the One Paseo EIR, operational GHG emissions were calculated considering GHG emissions reduction strategies (i.e., state measures and project design features). With these reduction strategies, Originally Proposed and Approved Project GHG emissions (combining construction and operations) were determined to be reduced to a level that would be consistent with the goals of Assembly Bill 32 (AB 32) and regulations adopted by the California Air Resources Board (CARB) pursuant to AB 32.

In summary, the One Paseo EIR concluded that GHG emission level impacts during construction and operations associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

New One Paseo Project

The Updated Air Quality Analysis determined that the construction area and activity associated with the New One Paseo Project would be essentially the same as the Originally

Proposed and Approved Projects. As such, the emissions associated with construction of the New One Paseo Project would be comparable to the Originally Proposed and Approved Projects.

The Updated Air Quality Analysis also determined that the reduction in New One Paseo Project traffic would result in a proportionate reduction in mobile-source GHG emissions in comparison with the Originally Proposed and Approved Projects. Furthermore, the New One Paseo Project would result in reduced energy demand due to reduced square footage. As such, the New One Paseo Project would result in lower GHG emissions than either the Originally Proposed Project or the Approved Project.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to GHG emission levels during construction and operations would be less than significant would also be applicable to the New One Paseo Project, and no mitigation measures are required. The New One Paseo Project would not result in any new GHG emissions impacts, nor substantially increase the severity of the impacts beyond those described in the One Paseo EIR.

Greenhouse Gas Plans and Policies

<u>One Paseo EIR</u>

The One Paseo EIR determined that because both the Originally Proposed and Approved Projects included features encouraged by the Conservation Element policies in the City's General Plan. Thus, the One Paseo EIR identified no conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

In summary, the One Paseo EIR concluded that impacts to GHG plans and policies associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

<u>New One Paseo Project</u>

The Updated Air Quality Analysis for the New One Paseo Project determined that because the New One Paseo Project would incorporate project features similar to the Originally Proposed and Approved Projects, there would be no conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to GHG plans and policies would be less than significant would also be applicable to the New One Paseo Project, and no mitigation measures were required. The New One Paseo Project would not result in any new environmental impacts associated with GHG policies and plans compliance, nor substantially increase the severity of the impacts beyond those described in the One Paseo EIR.

Paleontological Resources

One Paseo EIR

The analysis in the One Paseo EIR determined that the Originally Proposed and Approved Projects would require grading that could encroach into geologic formations containing significant paleontological resources. Therefore, the Originally Proposed and Approved Projects could result in significant paleontological resource impacts. Mitigation Measure 5.8-1, identified in the One Paseo EIR, would require excavation that could encroach into fossil-bearing formations be monitored and any important resources recovered.

In summary, the One Paseo EIR concluded that paleontological resource impacts associated with the Originally Proposed and Approved Project would be less than significant with mitigation incorporated.

New One Paseo Project

The New One Paseo Project would require grading similar to the Originally Proposed and Approved Projects. As a result, geologic formations containing significant paleontological resources could be affected. Mitigation Measure 5.8-1, identified in the One Paseo EIR for the Originally Proposed and Approved Projects, would also apply to the New One Paseo Project, thereby mitigating any potential impacts to a less than significant level.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to paleontological resources would be less than significant with mitigation incorporated would also be applicable to the New One Paseo Project and no new mitigation measures are required. The New One Paseo Project would not result in any new impacts on paleontological resources, nor substantially increase the severity of the impacts beyond those described in the One Paseo EIR.

Biological Resources

One Paseo EIR

The analysis in the One Paseo EIR determined that the Originally Proposed and Approved Projects would remove mature trees along Del Mar Heights Road. These trees could provide suitable nesting habitat for raptors. Therefore, construction activities and noise associated with the Originally Proposed and Approved Projects could disrupt nesting birds. Mitigation Measure 5.9-1, in the One Paseo EIR, required preconstruction surveys during the nesting season to determine if birds were nesting in the trees scheduled to be removed. If so, setbacks from occupied nests were required to protect nesting birds from construction activities.

In summary, the One Paseo EIR concluded that biological resources impacts associated with the Originally Proposed and Approved Projects would be less than significant with implementation of Mitigation Measure 5.9-1.

New One Paseo Project

The New One Paseo Project also would require removal of mature trees which could support nesting birds. Construction of a second westbound right-turn lane on Del Mar Heights Road at the I-5 northbound onramp would impact mature trees that would not otherwise be impacted with the extended right-turn lane required by the original mitigation measure. However, the same mitigation measure identified in the One Paseo EIR for the Originally Proposed Project and the Approved Project would also apply to the New One Paseo Project. Therefore, any potential impact to additional mature trees caused by the construction of a second westbound right-turn lane on Del Mar Heights Road at the I-5 northbound on-ramp would be mitigated to a less than significant level with implementation of Mitigation Measure 5.9-1.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to biological resources would be less than significant with mitigation incorporated would also be applicable to the New One Paseo Project. No new mitigation is required. The New One Paseo Project would not result in any new impacts on biological resources, nor substantially increase the severity of the impacts beyond those described in the One Paseo EIR.

Hydrology/Water Quality

Runoff

One Paseo EIR

The One Paseo EIR determined that on-site and off-site drainage systems related to the Originally Proposed and Approved Projects would have adequate capacity to accommodate post-development (100-year) flows, with no associated issues related to capacity shortfalls or flooding hazards. Flows from the site (and other associated watershed areas) would be contained in engineered storm drain facilities designed for ultimate flow prior to reaching Peñasquitos Lagoon. The One Paseo EIR concluded that no significant impacts related to increases in impervious surfaces and runoff rates/amounts would result from the Originally Proposed Project or the Approved Project.

In summary, the One Paseo EIR concluded that runoff impacts associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

New One Paseo Project

An update to the drainage study included in the One Paseo FEIR was prepared for the New One Paseo Project (Updated Drainage Study), and is included as Appendix G to this Addendum (Leppert Engineering 2015b). The Updated Drainage Study concluded that the New One Paseo Project would have similar but less intensive development than either the Originally Proposed Project or the Approved Project, and would provide similarly sized drainage facilities designed to accommodate the New One Paseo Project's runoff. As a result, impacts would be less than significant.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to runoff would be less than significant would also be applicable to the New One Paseo Project, and no mitigation measures were required. The New One Paseo Project would not result in any new runoff related environmental impacts, nor substantially increase the severity of the impacts beyond those described in the One Paseo EIR.

Drainage Patterns

One Paseo EIR

The One Paseo EIR determined that all of the drainage alterations associated with the Originally Proposed and Approved Projects would be minor. In addition, the One Paseo EIR took into account the fact that the Originally Proposed and Approved Projects would be subject to the hydromodification requirements outlined in the City Storm Water Standards Manual.
In summary, the One Paseo EIR concluded that drainage pattern impacts associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

New One Paseo Project

The New One Paseo Project would have similar but less intensive development than either the Originally Proposed Project or the Approved Project. Because the New One Paseo Project would provide similar hydromodification facilities and maintenance designed to accommodate drainage associated with the New One Paseo Project, impacts would be less than significant.

In summary, the conclusion of the One Paseo EIR that the impacts of the Original and the Approved Projects with respect to drainage patterns would be less than significant would also be applicable to the New One Paseo Project, and no mitigation measures are required. The New One Paseo Project would not result in any new environmental impacts related to drainage patterns, nor substantially increase the severity of the impacts beyond those described in the One Paseo EIR.

Water Quality Standards

One Paseo EIR

The One Paseo EIR determined that the Originally Proposed and Approved Projects would conform to all applicable regulatory criteria, water quality standards, and waste discharge requirements.

In summary, the One Paseo EIR concluded that water quality standards impacts associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

New One Paseo Project

Based on an addendum to the Water Quality Analysis (Leppert Engineering, 2015) included in Appendix H, the New One Paseo Project would have similar but less intensive development than either the Originally Proposed Project or the Approved Project. Because the New One Paseo Project would similarly conform to all applicable regulatory criteria, water quality standards, and waste discharge requirements, impacts would be less than significant.

In summary, the conclusion of the One Paseo EIR that the impacts of the Original and the Approved Projects with respect to water quality standards would be less than significant would also be applicable to the New One Paseo Project, and no mitigation measures are required. The New One Paseo Project would not result in any new water quality impacts, nor substantially increase the severity of the impacts beyond those described in the One Paseo EIR.

Groundwater

One Paseo EIR

The One Paseo EIR determined that the Originally Proposed and Approved Projects would not use groundwater as a supply, and if any shallow groundwater is encountered during construction, its removal would be short-term, would involve minor quantities, and would be subject to applicable regulatory requirements. The Originally Proposed and Approved Projects would entail the installation of impervious surfaces, which would reduce the infiltration and groundwater recharge capacity of the site, but these areas would be minor and offset by the proposed use of extensive landscaping and unlined drainage facilities. In addition, the entire project site vicinity and downstream areas are served by municipal water, with no known current use of groundwater in these areas.

In summary, the One Paseo EIR concluded that groundwater impacts associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

New One Paseo Project

The New One Paseo Project would have similar but less intensive development than either the Originally Proposed Project or the Approved Project. Because the New One Paseo Project would have the same site conditions and install similar impervious areas, landscaping, and unlined drainage facilities, impacts would be less than significant.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to groundwater would be less than significant would also be applicable to the New One Paseo Project, and no mitigation measures are required. The New One Paseo Project would not result in any new groundwater related environmental impacts, nor substantially increase the severity of the impacts beyond those described in the One Paseo EIR.

Public Utilities

One Paseo EIR

The One Paseo EIR made the conclusions summarized below for each public utility for both the Originally Proposed and Approved Projects.

Water Supply and Conservation - The proposed project would be consistent with Metropolitan Water District (MWD)/San Diego County Water Authority (SDCWA) supply/demand projections and applicable water supply regulations, and sufficient water was expected to be available to serve the proposed development over a 20-year planning horizon. Based on these conditions, the One Paseo EIR determined that no significant impacts related to potable water supplies/demand were determined to result from implementation of the Originally Proposed Project or the Approved Project.

Water Infrastructure - The Originally Proposed and Approved Projects would connect to existing water lines adjacent to the project site, and would not require any off-site pipeline upsizing or new water facilities. On-site water infrastructure would be designed and sized to meet the Original or Approved Project's water needs in conformance with City standards. Therefore, impacts to water infrastructure were determined to be less than significant in the One Paseo EIR.

Wastewater Infrastructure - Wastewater service would be adequately provided by existing City wastewater facilities, and would not require off-site pipeline upsizing or new wastewater facilities. On-site wastewater infrastructure would be designed and sized to meet the Original or Approved Project's wastewater needs in conformance with City standards. Therefore, impacts to wastewater infrastructure were determined to be less than significant in the One Paseo EIR.

Storm Water Drainage - The Originally Proposed and Approved Projects would connect to the existing City of San Diego storm drain system, which was constructed to accommodate the buildout of the property. On-site drainage facilities would be designed in accordance with City standards. Therefore, impacts related to storm water drainage were determined to be less than significant in the One Paseo EIR.

Solid Waste Disposal - A Waste Management Plan (WMP) was prepared and approved by the Environmental Services Department for the Originally Proposed and Approved Projects. Implementation of the approved WMP was made a condition of the SDP approval to ensure that direct solid waste impacts would be less than significant.

In summary, the One Paseo EIR concluded that public utility impacts associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

<u>New One Paseo Project</u>

An addendum to the water supply analysis included in the One Paseo EIR was prepared for the New One Paseo Project, and is included as Appendix I of this Addendum (Atkins 2015). The analysis concluded that, overall, the New One Paseo Project would have similar but less intensive development than either the Originally Proposed Project or the Approved Project, and would generate similar but no greater demand for water than analyzed in the One Paseo EIR.

An addendum to the water and sewer service analysis included in the One Paseo EIR was prepared for the New One Paseo Project, and is included as Appendix J of this Addendum (Atkins 2015b). The analysis concludes that the water and sewer infrastructure included in the New One Paseo Project would be adequate to meet the needs of the project. Fire flow was also found to be adequate.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to public utilities would be less than significant would also be applicable to the New One Paseo Project, and no mitigation measures are required. The New One Paseo Project would not result in any new public utilities impacts, nor substantially increase the severity of impacts beyond those described in the One Paseo EIR.

Public Services and Facilities/Recreation

<u>One Paseo EIR</u>

The conclusions reached in the One Paseo EIR for each public service for both the Original and the Approved Projects are summarized below.

Fire and Emergency Medical Services - The Originally Proposed and Approved Projects may result in minimal increases in fire calls for service, but no new facilities or improvements to existing facilities would be required as a result of either the Original or Approved Project. Consequently, impacts to community fire protection services were determined to be less than significant in the One Paseo EIR.

Police Protection Services - The Originally Proposed and Approved Projects may result in minimal increases in police calls for service, but no new facilities or improvements to existing facilities would be required as a result of the project. Consequently, impacts to police protection services were determined to be less than significant in the One Paseo EIR.

Schools - Although the Original and the Approved Projects would generate a number of school-age children, no significant impact was identified because the Original and Approved Project applicant would pay school fees. By law (Government Code 65996), payment of school fees constitutes full mitigation.

Libraries - Since there are adequate library facilities within the vicinity of the Originally Proposed and Approved Projects to accommodate the needs of any new residents and employees associated with the proposed development, no significant impacts to existing library facilities were identified in the One Paseo EIR.

Parks and Recreational Facilities - Since the Original and Approved Project applicant would pay a Facility and Benefits Assessment (FBA) fee specifically intended to offset development impacts on public facilities, including recreation, no associated significant impacts were determined to occur with respect to parks and recreation facilities in the One Paseo EIR.

In summary, the One Paseo EIR concluded that public services and facilities/recreation impacts associated with the Original and the Approved Projects would be less than significant. Consequently, no mitigation measures were required.

New One Paseo Project

The New One Paseo Project would have less intensive development than either the Originally Proposed Project or the Approved Projects and would result in a decreased demand on public services in comparison with the Originally Proposed and Approved Projects. Similar to the Originally Proposed Project and the Approved Project, the New One Paseo Project would pay school fees and a FBA fee specifically intended to offset development impacts on public facilities, including recreation. Therefore, impacts would be less than significant.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to public services and facilities/recreation would be less than significant would also be applicable to the New One Paseo Project, and no mitigation measures are required. The New One Paseo Project would not result in any new public services impacts, nor increase the severity of impacts beyond those described in the One Paseo EIR.

Health and Safety

Hazardous Materials

One Paseo EIR

The One Paseo EIR determined that construction of the Originally Proposed and Approved Projects would involve the use or storage of construction-related hazardous materials (i.e., fuels and oils), which could result in a significant health and safety risk to off-site receptors in the event of an accidental spill. Mitigation Measures 5.13-1 and 5.13-2 would require proper handling of hazardous materials during construction and preparation of a Health and Safety Plan.

The One Paseo EIR determined that long-term operations associated with uses under the Originally Proposed and Approved Projects would not be expected to involve large amounts or types of hazardous materials. While limited amounts of chemicals for routine maintenance (i.e., cleaners, paints, chlorine, and pesticides for landscape maintenance) could occur, the One Paseo EIR took into account the fact that the routine use and handling of hazardous materials would be regulated by local, state, and federal standards. Thus, operational health and safety impacts were determined to be less than significant, and no mitigation measures were required.

In summary, the One Paseo EIR concluded that construction hazardous material impacts associated with the Originally Proposed and Approved Projects would be potentially significant but mitigated with implementation of Mitigation Measures 5.13-1 and 5.13-2. Operational hazardous materials impacts associated with the Originally Proposed and Approved Projects would be less than significant. Consequently, no mitigation measures were required.

<u>New One Paseo Project</u>

Similar to the Originally Proposed and Approved Projects, potentially significant impacts associated with construction hazardous materials could occur during construction activities for the New One Paseo Project, including accidental releases of hazardous materials such as oil and gasoline from construction equipment. However, similar to the Originally Proposed and Approved Projects, implementation of Mitigation Measures 5.13-1 and 5.13-2 would reduce this potentially significant impact for the New One Paseo Project to a less than significant level.

Long-term operations associated with the New One Paseo Project would involve similar uses of chemicals for routine maintenance as anticipated for the Originally Proposed Project or the Approved Project, which, as discussed above, would be regulated by local, state, and federal standards.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to construction hazardous materials would be less than significant with mitigation incorporated would also be applicable to the New One Paseo Project. The conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to operational hazardous materials would be less than significant would also be applicable to the New One Paseo Project, and no new mitigation measures were required. The New One Paseo Project would not result in any new environmental impacts from hazardous materials, nor substantially increase the severity of impacts beyond those described in the One Paseo EIR.

Hazardous Materials Sites and Toxic Substances

<u>One Paseo EIR</u>

The One Paseo EIR determined that the Original and Approved Project site is not located within 1,000 feet of a known contamination site that would create a significant hazard. In addition, the site is not located within 2,000 feet of a Superfund site or on the State

Department of Toxic Substances Control (DTSC) Cortese List, pursuant to Section 65962.5 of the California Government Code.

In summary, the One Paseo EIR concluded that hazardous materials sites and toxic substances would not pose a significant health risk to residents associated with the Originally Proposed Project or the Approved Project. Thus, impacts were determined to be less than significant, and, no mitigation measures were required.

<u>New One Paseo Project</u>

The New One Paseo Project would be located on the same site as the Original and the Approved Projects. Therefore, the New One Paseo Project would not be located near known contamination sites, within 2,000 feet of a Superfund site or on the DTSC Cortese List.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to hazardous materials sites and toxic substances would be less than significant would also be applicable to the New One Paseo Project, and no mitigation measures are required. The New One Paseo Project would not result in any new environmental impacts from hazardous material sites and toxic substances, nor substantially increase the severity of impacts beyond those described in the One Paseo EIR.

Emergency Response Access

<u>One Paseo EIR</u>

The One Paseo EIR determined that emergency access to all surrounding properties would be maintained throughout the construction period, and a traffic control plan and haul route plan would be prepared and implemented during construction of both the Originally Proposed and Approved Projects. Therefore, the Originally Proposed and Approved Projects would not interfere with emergency response during construction.

The One Paseo EIR determined that the Originally Proposed and Approved Projects would provide adequate emergency access within the site, including by preparing a fire access plan, posting fire lane signage along the roadways, and providing additional emergency requirements such as fire hydrants in accordance with City requirements. In addition, the signalized access driveways would be equipped with signal pre-emption devices to assist emergency vehicles. The One Paseo EIR concluded that the Originally Proposed and Approved Projects would not interfere with implementation of any adopted emergency response or evacuation plans or emergency access following project construction.

In summary, the One Paseo EIR concluded that impacts of the Originally Proposed Project or the Approved Project on emergency response access during construction and operations would be less than significant. Consequently, no mitigation measures were required.

New One Paseo Project

The New One Paseo Project would implement the same access and traffic control actions during construction as the Originally Proposed and the Approved Projects, including preparing a fire access plan, posting fire lane signage along the roadways, and providing additional emergency requirements such as fire hydrants in accordance with City requirements.

As with the Originally Proposed and Approved Projects, operations associated with the New One Paseo Project would not impact emergency response. As with the Originally Proposed and Approved Projects, the signalized access driveways would be equipped with signal pre-emption services to assist emergency vehicles. The New One Paseo Project would install traffic signal system upgrades and optimization on a total of 10 intersections along Del Mar Heights Road from the intersection of Mango Drive to the intersection of Lansdale Drive to further assist emergency vehicle access.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and the Approved Projects with respect to emergency response during construction and operations would be less than significant would also be applicable to the New One Paseo Project, and no mitigation measures are required. The New One Paseo Project would not result in any new environmental impacts for emergency response access, nor substantially increase the severity of impacts beyond those described in the One Paseo EIR.

Historical Resources

One Paseo EIR

The analysis in the One Paseo EIR determined that construction of the Originally Proposed and Approved Projects was expected to involve grading that could encroach into buried historical resources which may exist on the site. Thus, the Originally Proposed and Approved Projects were determined to potentially result in significant impacts to buried historical resources. Mitigation Measure 5.14-1, in the One Paseo EIR, requires monitoring during construction to identify subsurface historical resources and implementation of a data recovery plan if important resources are encountered.

In summary, the One Paseo EIR concluded that potentially significant impacts to buried historic resources could be associated with the Originally Proposed and Approved Projects. However, it was concluded that implementation of Mitigation Measure 5.14-1 would reduce the impact to a less than significant level.

New One Paseo Project

The New One Paseo Project would be located on the same site as the Originally Proposed Project and Approved Project, and would require similar grading that could encroach into buried historical resources should they occur on the site. Mitigation Measure 5.14-1 identified in the One Paseo EIR for the Originally Proposed and Approved Projects would also apply to the New One Paseo Project.

In summary, the conclusion of the One Paseo EIR that the impacts of the Originally Proposed and Approved Projects with respect to buried historic resources would be less than significant with mitigation incorporated is also applicable to the New One Paseo Project. No new mitigation is required. The New One Paseo Project would not result in any new historical resources impacts, nor substantially increase the severity of impacts beyond those described in the One Paseo EIR.

VI. MITIGATION, MONITORING AND REPORTING PROGRAM INCORPORATED INTO THE PROJECT:

GENERAL REQUIREMENTS

As Lead Agency for the proposed project under CEQA, the City of San Diego will administer the Mitigation, Monitoring, and Reporting Program (MMRP) for the following environmental issue areas as identified in the Addendum to the One Paseo Project EIR: Transportation/ Circulation/Parking, Noise, Paleontological Resources, Biological Resources, Health and Safety, and Historical Resources. The mitigation measures identified below include all applicable measures from the Addendum to the One Paseo Project EIR (Project No. 193036; SCH No. 2010051073).

Section 21081.6 to the State of California PRC requires a Lead or Responsible Agency that approves or carries out a project where an EIR has identified significant environmental effects to adopt a "reporting or monitoring program for adopted or required changes to mitigate or avoid significant environmental effects." The City of San Diego is the Lead Agency for the One Paseo Project EIR, and therefore must ensure the enforceability of the MMRP. An EIR and Addendum has been prepared for this project that addresses potential environmental impacts and, where appropriate, recommends measures to mitigate these impacts. As such, an MMRP is required to ensure that adopted mitigation measures are implemented. Therefore the following general measures are included in this MMRP:

A. GENERAL REQUIREMENTS – PART I
Plan Check Phase (prior to permit issuance)

1. Prior to the issuance of a Notice To Proceed (NTP) for a subdivision, or any construction permits, such as Demolition, Grading or Building, or beginning any construction related activity on-site, the Development Services Department (DSD) Director's Environmental Designee (ED) shall review and approve all Construction Documents (CD), (plans, specification, details, etc.) to ensure the MMRP requirements are incorporated into the design.

2. In addition, the ED shall verify that the MMRP Conditions/Notes that apply ONLY to the construction phases of this project are included VERBATIM, under the heading, "**ENVIRONMENTAL/MITIGATION REQUIREMENTS**."

3. These notes must be shown within the first three (3) sheets of the construction documents in the format specified for engineering construction document templates as shown on the City website:

   http://www.sandiego.gov/development-services/industry/standtemp.shtml

4. The **TITLE INDEX SHEET** must also show on which pages the "Environmental/Mitigation Requirements" notes are provided.

5. **SURETY AND COST RECOVERY –** The Development Services Director or City Manager may require appropriate surety instruments or bonds from private Permit Holders to ensure the long term performance or implementation of required mitigation measures or programs. The City is authorized to recover its cost to offset the salary, overhead, and expenses for City personnel and programs to monitor qualifying projects.

B. GENERAL REQUIREMENTS – PART II
Post Plan Check (After permit issuance/Prior to start of construction)

1. **PRE CONSTRUCTION MEETING IS REQUIRED TEN (10) WORKING DAYS PRIOR TO BEGINNING ANY WORK ON THIS PROJECT.** The PERMIT HOLDER/OWNER is responsible to arrange and perform this meeting by contacting the CITY RESIDENT ENGINEER (RE) of the Field Engineering Division and City staff from MITIGATION MONITORING COORDINATION (MMC). Attendees must also include the Permit holder's Representative(s) and Job Site Superintendent.

   Note:

   Failure of all responsible Permit Holder's representatives and consultants to attend shall require an additional meeting with all parties present.

   CONTACT INFORMATION:

   a) The PRIMARY POINT OF CONTACT is the **RE** at the **Field Engineering Division – 858-627-3200**
   b) For Clarification of ENVIRONMENTAL REQUIREMENTS, it is also required to call **RE and MMC at 858-627-3360**

2. **MMRP COMPLIANCE:** This Project, Project Tracking System (PTS) #193036 shall conform to the mitigation requirements contained in the associated Environmental Document and implemented to the satisfaction of the DSD's Environmental Designee (MMC) and the City Engineer (RE). The requirements may not be reduced or changed but may be annotated (i.e., to explain when and how compliance is being met and location of verifying proof, etc.). Additional clarifying information may also be added to other relevant plan sheets and/or specifications as appropriate (i.e., specific locations, times of monitoring, methodology, etc.

Note:

Permit Holder's Representatives must alert RE and MMC if there are any discrepancies in the plans or notes, or any changes due to field conditions. All conflicts must be approved by RE and MMC BEFORE the work is performed.

3. **OTHER AGENCY REQUIREMENTS:** Evidence of compliance with all other agency requirements or permits shall be submitted to the RE and MMC for review and acceptance prior to the beginning of work or within one week of the Permit Holder obtaining documentation of those permits or requirements. Evidence shall include copies of permits, letters of resolution or other documentation issued by the responsible agency.

4. **MONITORING EXHIBITS:** All consultants are required to submit, to RE and MMC, a monitoring exhibit on a 11x17 reduction of the appropriate construction plan, such as site plan, grading, landscape, etc., marked to clearly show the specific areas including the **LIMIT OF WORK**, scope of that discipline's work, and notes indicating when in the construction schedule that work will be performed. When necessary for clarification, a detailed methodology of how the work will be performed shall be included.

   Note:

   Surety and Cost Recovery – When deemed necessary by the Development Services Director or City Manager, additional surety instruments or bonds from the private Permit Holder may be required to ensure the long term performance or implementation of required mitigation measures or programs. The City is authorized to recover its cost to offset the salary, overhead, and expenses for City personnel and programs to monitor qualifying projects.

5. **OTHER SUBMITTALS AND INSPECTIONS:** The Permit Holder/Owner's representative shall submit all required documentation, verification letters, and requests for all associated inspections to the RE and MMC for approval per the following schedule:

Issue Area	***Document Submittal***	***Assoc Inspection/Approvals***
General	Consultant Qualification Letters	Prior to Pre-con Meeting
General	Consultant Const. Monitoring Exhibits	Prior to or at the Pre-con Meeting
Geology	As Graded Soils Report	Geotechnical/fault inspection
Paleontology	Paleontology Reports	Paleontology site observation
Archaeology	Archaeology Reports	Archaeology/Historic site observation
Biology	Biology Reports	Biology inspection

Noise	Acoustical Reports	Noise mitigation features inspection
Traffic	Traffic Reports	Traffic features site observation
Waste Management	Waste Management Reports	Waste management inspections
Bond Release	Request for Bond Release letter	Final MMRP inspections prior to Bond Release Letter

SPECIFIC MMRP ISSUE AREA CONDITIONS/REQUIREMENTS

Transportation/Circulation/Parking

Mitigation Measure 5.2-1: Prior to issuance of the first building permit for an office building, the project applicant shall assure by permit and bond reconfiguration of the median on the Del Mar Heights Road bridge to extend the EB to NB dual left-turn pocket to 400 feet to the satisfaction of the City Engineer and Caltrans. Prior to issuance of the first certificate of occupancy for an office building, the median reconfiguration shall be completed and accepted by the City Engineer or Caltrans.

Mitigation Measure 5.2-1.1: Prior to issuance of the first building permit, the project applicant shall contribute to Caltrans $1,192,500 toward the provision of a third eastbound through lane on the Del Mar Heights Road bridge to the satisfaction of the City Engineer. The project applicant has voluntarily agreed to pay Caltrans an additional $307,500 at that time, an amount in excess of its fair share contribution, for a total payment of $1,500,000. The amount paid in excess of the applicant's fair share contribution is included as a project feature.

Mitigation Measure 5.2-2: (a) Prior to issuance of the first building permit, the project applicant shall assure by permit and bond the widening of the segment of Del Mar Heights Road within City jurisdiction to extend the WB right-turn pocket at the Del Mar Heights Road/I-5 NB on-ramp by 470 feet east of the existing limit line (at intersection) to the satisfaction of the City Engineer. Prior to issuance of the first certificate of occupancy, the widening and lengthening shall be completed and accepted by the City Engineer. (b) Prior to issuance of the first building permit for an office building, the project applicant shall assure by permit and bond the widening of the segment of Del Mar Heights Road to include a second WB to NB right turn lane at the Del Mar Heights Road/I-5 NB on-ramp within Caltrans' jurisdiction to the satisfaction of Caltrans and the City Engineer. Prior to issuance of the first certificate of occupancy for an office building, the widening shall be completed and accepted by Caltrans and the City Engineer. Upon completion of this mitigation measure, one right-turn lane shall extend to the west side of the AT&T building and one right-turn lane shall extend to the east side of the AT&T building.

Mitigation Measure 5.2-3: Prior to issuance of the first building permit, the project applicant shall make a fair-share contribution (2.5 percent) towards the widening of El Camino Real from Via de la Valle to San Dieguito Road to a four-lane Major to the satisfaction of the City Engineer.

Mitigation Measure 5.2-4: Prior to issuance of the first building permit, the project applicant shall make a fair-share contribution (9.7 percent) towards the widening of Via de la Valle from San Andres Drive to El Camino Real (West) to a four-lane Major to the satisfaction of the City Engineer.

Mitigation Measure 5.2-5: Prior to issuance of the first building permit, the project applicant shall assure by permit and bond installation of a traffic signal at the Carmel Creek Road/Del Mar Trail intersection, to the satisfaction of the City Engineer. Prior to issuance of the first certificate of occupancy, the traffic signal shall be completed and accepted by the City Engineer.

Mitigation Measure 5.2-6: Prior to issuance of the first building permit, the project applicant shall assure by permit and bond to the satisfaction of the City Engineer the restriping and signal modification to provide a third NB left-turn lane at the intersection of Del Mar Heights Road and High Bluff Drive, and lengthen the EB left-turn lane by 90 feet and modify the raised median to accommodate this. Prior to issuance of the first certificate of occupancy, the third NB left-turn lane and EB left-turn lane lengthening shall be completed and accepted by the City Engineer.

Mitigation Measure 5.2-7: Prior to issuance of the first building permit, the project applicant shall assure by permit and bond construction of a 200-foot long EB right-turn lane plus appropriate transition at the Del Mar Heights Road/El Camino Real intersection, to the satisfaction of the City Engineer. Prior to issuance of the first certificate of occupancy, the 200-foot long EB right-turn lane shall be completed and accepted by the City Engineer.

Mitigation Measure 5.2-8: Prior to issuance of the first building permit for an office building, the project applicant shall make a fair-share contribution (2.7 percent) towards the widening and re-striping of the EB approach to provide one left, one shared through/left-turn, one through, and two right-turn lanes at the El Camino Real/SR 56 EB on-ramp intersection to the satisfaction of the City Engineer.

Mitigation Measure 5.2-9: Prior to issuance of the first building permit for an office building, the project applicant shall assure by permit and bond construction of the following improvements at the Del Mar Heights Road/I-5 NB ramps to the satisfaction of the City Engineer and Caltrans: (1) widen/re-stripe the I-5 NB off-ramp to include dual left, one shared through/right, and one right-turn lane; (2) widen the segment of Del Mar Heights Road to include a second WB to NB right-turn lane at the Del Mar Heights Road/I-5 NB on-ramp within Caltrans' jurisdiction; and (3) reconfigure the median on the Del Mar Heights Road bridge to extend the EB dual left-turn pocket to 400 feet. Prior to issuance of the first certificate of occupancy for an office building, all improvements in this mitigation measure shall be completed and accepted by the City Engineer and Caltrans.

Mitigation Measure 5.2-10: Prior to issuance of the first building permit for an office building, the project applicant shall make a fair-share contribution (25.5 percent) towards adding an HOV lane to the I-5 SB loop on-ramp to the satisfaction of the City Engineer.

Mitigation Measure 5.2-11: Prior to issuance of the first building permit for an office building, the project applicant shall make a fair-share contribution (31.1 percent) towards widening and restriping to add a HOV lane to the I-5 NB on-ramp to the satisfaction of the City Engineer.

Noise

Mitigation Measure 5.4-1: Prior to issuance of building permits, a noise analysis shall be completed to assess building-specific stationary noise sources and impacts to on-site uses. Appropriate noise attenuation measures identified in the noise analysis shall be incorporated into the project design to ensure compliance with the Noise Ordinance noise limits for stationary sources (i.e., interior noise levels of 45 dBA L_{EQ} or less for residential and hotel uses; 50 dBA L_{EQ} or less for commercial uses). Methods for ensuring compliant interior noise levels may include, but would not be limited to, the following:

- Installation of roof-top mechanical ventilation and HVAC units on mounts that isolate the building from vibration caused by the machinery;
- In the floors separating residential uses from non-residential uses, use additional thicknesses of building materials and/or materials designed to isolate the residential spaces from vibration generated by non-residential spaces;
- Commercial air handling ducts shall not be routed in or adjacent to interior living space walls without specific plans to address isolation;
- Commercial HVAC systems shall not be mounted over interior living areas without specific plans to address isolation;
- Clusters of residential HVAC systems shall not be mounted directly over residential areas;
- Coolant or large water lines including HVAC water for commercial services shall not be routed in walls adjacent to living areas without specific plans to address isolation;
- Operable windows shall not be located where they look directly at any rooftop HVAC systems in adjacent buildings;
- Elevator shafts shall not be located directly adjacent to living quarters without specific plans to address isolation; and/or
- Commercial spaces for nighttime entertainment shall not have a common floor ceiling to a living space.

Once the project is constructed and in full operation, the developer shall conduct on-site noise measurements to verify that noise planning and attenuation measures identified in the noise analysis have mitigated project noise to levels below those proscribed by the Noise Ordinance noise limits for stationary sources.

Mitigation Measure 5.4-2: Prior to issuance of building permits, an exterior-to-interior noise analysis shall be completed to assess off-site noise sources and impacts to interior on-site residential and commercial uses. Appropriate noise planning and attenuation measures identified in the noise analysis shall be incorporated into the project design to ensure compliance with the General Plan Noise Element Land use - Noise Compatibility Guidelines (i.e., interior noise levels of 45 dBA CNEL or less for residential and hotel uses; 50 dBA CNEL or less for commercial uses). Methods for ensuring compliant interior noise levels may include, but would not be limited to, the following:

- Use of window glazing with an increased sound transmission classification;
- Use of additional thicknesses of interior drywall; and/or
- Use of additional thicknesses of exterior building materials.

Once the project is constructed and in full operation, interior noise measurements shall be conducted to verify that exterior-to-interior noise planning has mitigated project noise levels to ensure compliance with the General Plan Noise Element Land use – Noise Compatibility Guidelines.

Mitigation Measure 5.4-3: Prior to issuance of building permits, an interior noise analysis shall be completed to assess on-site noise sources and impacts to interior on-site residential uses. Appropriate noise planning and attenuation measures identified in the noise analysis shall be incorporated into the project design to ensure compliance with the General Plan Noise Element
Land use - Noise Compatibility Guidelines. Potential noise planning and attenuation measures may include, but are not limited to, the following:

- Commercial air handling ducts shall not be routed in or adjacent to interior living space walls without specific plans to address isolation;
- Commercial HVAC systems shall not be mounted over interior living areas without specific plans to address isolation;
- Clusters of residential HVAC systems shall not be mounted directly over residential areas;
- Coolant or large water lines including HVAC water for commercial services shall not be routed in walls adjacent to living areas without specific plans to address isolation;
- Operable windows shall not be located where they look directly at any rooftop HVAC systems in adjacent buildings;
- Elevator shafts shall not be located directly adjacent to living quarters without specific plans to address isolation;
- Commercial spaces for nighttime entertainment shall not have a common floor ceiling to a living space;
- Limitations upon the use of exterior amplified music systems associated with entertainment such as prohibiting exterior amplified music systems in areas directly adjacent to or below on-site residences, [1] and

[1] This excludes temporary outside amplification systems use for a short-term special event conducted with a separate City special event permit.

- Commercial lease agreements shall include strict enforceable measures to control interior and exterior noise to limit impacts to residential areas.

Once the project is constructed and in full operation, interior noise measurements shall be conducted to verify that interior noise planning has mitigated project noise levels to ensure compliance with the General Plan Noise Element Land use – Noise Compatibility Guidelines.

Mitigation Measure 5.4-4: Whenever excavation occurs within 100 feet of an occupied residential unit within the project, noise attenuation shall be provided sufficient to comply with the Noise Ordinance (i.e., a 12-hour average of greater than 75 dBA L_{EQ}). Potential attenuation measures include, but are not limited to, use of sound walls, sound blankets, noise attenuation devices/modifications to construction equipment, and use of quieter equipment.

Paleontological Resources

Mitigation Measure 5.8-1: The following shall be implemented:

I. Prior to Permit Issuance

A. Entitlements Plan Check

1. Prior to issuance of any construction permits, including but not limited to, the first Grading Permit, Demolition Plans/Permits and Building Plans/Permits or a Notice to Proceed for Subdivisions, but prior to the first preconstruction meeting, whichever is applicable, the ADD Environmental designee shall verify that the requirements for Paleontological Monitoring have been noted on the appropriate construction documents.

B. Letters of Qualification have been submitted to ADD

1. The applicant shall submit a letter of verification to MMC identifying the PI for the project and the names of all persons involved in the paleontological monitoring program, as defined in the City of San Diego Paleontology Guidelines.

2. MMC will provide a letter to the applicant confirming the qualifications of the PI and all persons involved in the paleontological monitoring of the project.

3. Prior to the start of work, the applicant shall obtain approval from MMC for any personnel changes associated with the monitoring program.

II. Prior to Start of Construction

A. Verification of Records Search

1. The PI shall provide verification to MMC that a site specific records search has been completed. Verification includes, but is not limited to a copy of a confirmation letter from San Diego Natural History Museum, other institution or,

if the search was in-house, a letter of verification from the PI stating that the search was completed.

2. The letter shall introduce any pertinent information concerning expectations and probabilities of discovery during trenching and/or grading activities.

B. PI Shall Attend Precon Meetings

1. Prior to beginning any work that requires monitoring; the Applicant shall arrange a Precon Meeting that shall include the PI, CM and/or Grading Contractor, RE, BI, if appropriate, and MMC. The qualified paleontologist shall attend any grading/excavation related Precon Meetings to make comments and/or suggestions concerning the Paleontological Monitoring program with the Construction Manager and/or Grading Contractor.

   a. If the PI is unable to attend the Precon Meeting, the Applicant shall schedule a focused Precon Meeting with MMC, the PI, RE, CM or BI, if appropriate, prior to the start of any work that requires monitoring.

2. Identify Areas to be Monitored

   Prior to the start of any work that requires monitoring, the PI shall submit a PME based on the appropriate construction documents (reduced to 11x17) to MMC identifying the areas to be monitored including the delineation of grading/excavation limits. The PME shall be based on the results of a site specific records search as well as information regarding existing known soil conditions (native or formation).

3. When Monitoring Will Occur

   a. Prior to the start of any work, the PI shall also submit a construction schedule to MMC through the RE indicating when and where monitoring will occur.

   b. The PI may submit a detailed letter to MMC prior to the start of work or during construction requesting a modification to the monitoring program. This request shall be based on relevant information such as review of final construction documents which indicate conditions such as depth of excavation and/or site graded to bedrock, presence or absence of fossil resources, etc., which may reduce or increase the potential for resources to be present.

III. During Construction

A. Monitor Shall be Present During Grading/Excavation/Trenching

1. The monitor shall be present full-time during grading/excavation/trenching activities as identified on the PME that could result in impacts to formations with

high and moderate resource sensitivity. **The Construction Manager is responsible for notifying the RE, PI, and MMC of changes to any construction activities such as in the case of a potential safety concern within the area being monitored. In certain circumstances OSHA safety requirements may necessitate modification of the PME.**

2. The PI may submit a detailed letter to MMC during construction requesting a modification to the monitoring program when a field condition such as trenching activities that do not encounter formational soils as previously assumed, and/or when unique/unusual fossils are encountered, which may reduce or increase the potential for resources to be present.

3. The monitor shall document field activity via the CSVR. The CSVRs shall be faxed by the CM to the RE the first day of monitoring, the last day of monitoring, monthly (**Notification of Monitoring Completion)**, and in the case of ANY discoveries. The RE shall forward copies to MMC.

B. Discovery Notification Process

1. In the event of a discovery, the Paleontological Monitor shall direct the contractor to temporarily divert trenching activities in the area of discovery and immediately notify the RE or BI, as appropriate.

2. The Monitor shall immediately notify the PI (unless Monitor is the PI) of the discovery.

3. The PI shall immediately notify MMC by phone of the discovery, and shall also submit written documentation to MMC within 24 hours by fax or email with photos of the resource in context, if possible.

C. Determination of Significance

1. The PI shall evaluate the significance of the resource.

   a. The PI shall immediately notify MMC by phone to discuss significance determination and shall also submit a letter to MMC indicating whether additional mitigation is required. The determination of significance for fossil discoveries shall be at the discretion of the PI.

   b. If the resource is significant, the PI shall submit a Paleontological Recovery Program (PRP) and obtain written approval from MMC. Impacts to significant resources must be mitigated before ground disturbing activities in the area of discovery will be allowed to resume.

   c. If resource is not significant (e.g., small pieces of broken common shell fragments or other scattered common fossils) the PI shall notify the RE, or BI as appropriate, that a non-significant discovery has been made. The

Paleontologist shall continue to monitor the area without notification to MMC unless a significant resource is encountered.

d. The PI shall submit a letter to MMC indicating that fossil resources will be collected, curated, and documented in the Final Monitoring Report. The letter shall also indicate that no further work is required.

IV. Night and/or Weekend Work

A. If night and/or weekend work is included in the contract

1. When night and/or weekend work is included in the contract package, the extent and timing shall be presented and discussed at the Precon meeting.

2. The following procedures shall be followed.

a. No Discoveries
In the event that no discoveries were encountered during night and/or weekend work, The PI shall record the information on the CSVR and submit to MMC via fax by 8 AM on the next business day.

b. Discoveries
All discoveries shall be processed and documented using the existing procedures detailed in Sections III - During Construction.

c. Potentially Significant Discoveries
If the PI determines that a potentially significant discovery has been made, the procedures detailed under Section III - During Construction shall be followed.

d. The PI shall immediately contact MMC, or by 8 AM on the next business day to report and discuss the findings as indicated in Section III-B, unless other specific arrangements have been made.

B. If night work becomes necessary during the course of construction

1. The Construction Manager shall notify the RE, or BI, as appropriate, a minimum of 24 hours before the work is to begin.
2. The RE, or BI, as appropriate, shall notify MMC immediately.

C. All other procedures described above shall apply, as appropriate.

V. Post Construction

A. Preparation and Submittal of Draft Monitoring Report

1. The PI shall submit two copies of the Draft Monitoring Report (even if negative), prepared in accordance with the Paleontological Guidelines which describes the results, analysis, and conclusions of all phases of the Paleontological Monitoring Program (with appropriate graphics) to MMC for review and approval within 90 days following the completion of monitoring,

    a. For significant paleontological resources encountered during monitoring, the Paleontological Recovery Program shall be included in the Draft Monitoring Report.

    b. Recording Sites with the San Diego Natural History Museum

    The PI shall be responsible for recording (on the appropriate forms) any significant or potentially significant fossil resources encountered during the Paleontological Monitoring Program in accordance with the City's Paleontological Guidelines, and submittal of such forms to the San Diego Natural History Museum with the Final Monitoring Report.

2. MMC shall return the Draft Monitoring Report to the PI for revision or for preparation of the Final Report.

3. The PI shall submit revised Draft Monitoring Report to MMC for approval.

4. MMC shall provide written verification to the PI of the approved report.

5. MMC shall notify the RE or BI, as appropriate, of receipt of all Draft Monitoring Report submittals and approvals.

B. Handling of Fossil Remains

1. The PI shall be responsible for ensuring that all fossil remains collected are cleaned and catalogued.

2. The PI shall be responsible for ensuring that all fossil remains are analyzed to identify function and chronology as they relate to the geologic history of the area; that faunal material is identified as to species; and that specialty studies are completed, as appropriate

C. Curation of fossil remains: Deed of Gift and Acceptance Verification

1. The PI shall be responsible for ensuring that all fossil remains associated with the monitoring for this project are permanently curated with an appropriate institution.

2. The PI shall include the Acceptance Verification from the curation institution in the Final Monitoring Report submitted to the RE or BI and MMC.

D. Final Monitoring Report(s)

1. The PI shall submit two copies of the Final Monitoring Report to MMC (even if negative), within 90 days after notification from MMC that the draft report has been approved.

2. The RE shall, in no case, issue the Notice of Completion until receiving a copy of the approved Final Monitoring Report from MMC which includes the Acceptance Verification from the curation institution.

Biological Resources

Mitigation Measure 5.9-1: Prior to the issuance of any authorization to proceed, the ADD Environmental designee shall ensure that the following measures are included as notes in the construction plans and grading plans:

1. If project grading/brush management is proposed in or adjacent to native habitat during the typical bird breeding season (i.e. February 1 - September 15), or an active nest is confirmed, the project biologist shall conduct a pre-grading survey for active nests in the development area and within 300 feet of it, and submit a letter report to MMC prior to the preconstruction meeting.

   A. If active nests are confirmed, the report shall include mitigation in conformance with the City's Biology Guidelines and applicable State and Federal Law (i.e., appropriate follow up surveys, monitoring schedules, construction and noise barriers/buffers, etc.) to the satisfaction of the Assistant Deputy Director (ADD) of the Entitlements Division. Mitigation requirements determined by the project biologist and the ADD shall be incorporated into the project's Biological Construction Monitoring Exhibit (BCME) and monitoring results incorporated in to the final biological construction monitoring report.

   B. If no active nests are confirmed per "A" above, mitigation under "A" is not required.

Health and Safety

Mitigation Measure 5.13-1: Construction permits shall designate staging areas where fueling and oil-changing activities are permitted. No fueling and oil-changing activities shall be permitted outside the designated staging areas. The staging areas, as much as practicable, shall be located on level terrain and away from sensitive land uses such as residences, and schools. Staging areas shall not be located near any stream channels or wetlands. The proposed staging areas shall be identified in the construction site plans, which shall be submitted to the Regional Water Quality Control Board as part of the Notice of Intent to File under the NPDES permit process.

Mitigation Measure 5.13-2: Prior to construction, a Health and Safety Plan shall be prepared and worker training shall be implemented to manage potential health and safety hazards to workers and the public.

Historical Resources

Mitigation Measure 5.14-1: The following measures shall be implemented:

I. Prior to Permit Issuance

A. Entitlements Plan Check

1. Prior to issuance of any construction permits, including but not limited to, the first Grading Permit, Demolition Plans/Permits and Building Plans/Permits or a Notice to Proceed for Subdivisions, but prior to the first preconstruction meeting, whichever is applicable, the ADD Environmental designee shall verify that the requirements for Archaeological Monitoring and Native American monitoring have been noted on the appropriate construction documents.

B. Letters of Qualification have been submitted to ADD

1. The applicant shall submit a letter of verification to MMC identifying the PI for the project and the names of all persons involved in the archaeological monitoring program, as defined in the City of San Diego HRG. If applicable, individuals involved in the archaeological monitoring program must have completed the 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with certification documentation.

2. MMC will provide a letter to the applicant confirming the qualifications of the PI and all persons involved in the archaeological monitoring of the project.

3. Prior to the start of work, the applicant must obtain approval from MMC for any personnel changes associated with the monitoring program.

II. Prior to Start of Construction

A. Verification of Records Search

1. The PI shall provide verification to MMC that a site specific records search (¼-mile radius) has been completed. Verification includes, but is not limited to a copy of a confirmation letter from South Coast Information Center, or, if the search was in-house, a letter of verification from the PI stating that the search was completed.

2. The letter shall introduce any pertinent information concerning expectations and probabilities of discovery during trenching and/or grading activities.

3. The PI may submit a detailed letter to MMC requesting a reduction to the ¼-mile radius.

B. PI Shall Attend Precon Meetings

1. Prior to beginning any work that requires monitoring; the Applicant shall arrange a Precon Meeting that shall include the PI, CM and/or Grading Contractor, RE, BI, if appropriate, and MMC. The qualified Archaeologist and Native American Monitor shall attend any grading/excavation related Precon Meetings to make comments and/or suggestions concerning the Archaeological Monitoring program with the Construction Manager and/or Grading Contractor.

    a. If the PI is unable to attend the Precon Meeting, the Applicant shall schedule a focused Precon Meeting with MMC, the PI, RE, CM or BI, if appropriate, prior to the start of any work that requires monitoring.

2. Identify Areas to be Monitored

    a. Prior to the start of any work that requires monitoring, the PI shall submit an AME based on the appropriate construction documents (reduced to 11x17) to MMC identifying the areas to be monitored including the delineation of grading/excavation limits.

    b. The AME shall be based on the results of a site specific records search as well as information regarding existing known soil conditions (native or formation).

3. When Monitoring Will Occur

    a. Prior to the start of any work, the PI shall also submit a construction schedule to MMC through the RE indicating when and where monitoring will occur.

    b. The PI may submit a detailed letter to MMC prior to the start of work or during construction requesting a modification to the monitoring program. This request shall be based on relevant information such as review of final construction documents which indicate site conditions such as depth of excavation and/or site graded to bedrock, etc., which may reduce or increase the potential for resources to be present.

III. During Construction

A. Monitor(s) Shall be Present During Grading/Excavation/Trenching

1. The Archaeological Monitor shall be present full-time during all soil disturbing and grading/excavation/trenching activities which could result in impacts to archaeological resources as identified on the AME. **The Construction Manager**

is responsible for notifying the RE, PI, and MMC of changes to any construction activities such as in the case of a potential safety concern within the area being monitored. In certain circumstances OSHA safety requirements may necessitate modification of the AME.

2. The Native American consultant/monitor shall determine the extent of their presence during soil disturbing and grading/excavation/trenching activities based on the AME and provide that information to the PI and MMC. If prehistoric resources are encountered during the Native American consultant/monitor's absence, work shall stop and the Discovery Notification Process detailed in Section III.B-C and IV.A-D shall commence.

3. The PI may submit a detailed letter to MMC during construction requesting a modification to the monitoring program when a field condition such as modern disturbance post-dating the previous grading/trenching activities, presence of fossil formations, or when native soils are encountered that may reduce or increase the potential for resources to be present.

4. The archaeological and Native American consultant/monitor shall document field activity via the Consultant Site Visit Record (CSVR). The CSVR's shall be faxed by the CM to the RE the first day of monitoring, the last day of monitoring, monthly (**Notification of Monitoring Completion)**, and in the case of ANY discoveries. The RE shall forward copies to MMC.

B. Discovery Notification Process

1. In the event of a discovery, the Archaeological Monitor shall direct the contractor to temporarily divert all soil disturbing activities, including but not limited to digging, trenching, excavating or grading activities in the area of discovery and in the area reasonably suspected to overlay adjacent resources and immediately notify the RE or BI, as appropriate.

2. The Monitor shall immediately notify the PI (unless Monitor is the PI) of the discovery.

3. The PI shall immediately notify MMC by phone of the discovery, and shall also submit written documentation to MMC within 24 hours by fax or email with photos of the resource in context, if possible.

4. No soil shall be exported off-site until a determination can be made regarding the significance of the resource specifically if Native American resources are encountered.

C. Determination of Significance

1. The PI and Native American consultant/monitor, where Native American resources are discovered shall evaluate the significance of the resource. If Human Remains are involved, follow protocol in Section IV below.

    a. The PI shall immediately notify MMC by phone to discuss significance determination and shall also submit a letter to MMC indicating whether additional mitigation is required.

    b. If the resource is significant, the PI shall submit an Archaeological Data Recovery Program (ADRP) which has been reviewed by the Native American consultant/monitor, and obtain written approval from MMC. Impacts to significant resources must be mitigated before ground disturbing activities in the area of discovery will be allowed to resume. **Note: If a unique archaeological site is also an historical resource as defined in CEQA, then the limits on the amount(s) that a project applicant may be required to pay to cover mitigation costs as indicated in CEQA Section 21083.2 shall not apply.**

    c. If the resource is not significant, the PI shall submit a letter to MMC indicating that artifacts will be collected, curated, and documented in the Final Monitoring Report. The letter shall also indicate that that no further work is required.

IV. Discovery of Human Remains

If human remains are discovered, work shall halt in that area and no soil shall be exported off-site until a determination can be made regarding the provenance of the human remains; and the following procedures as set forth in CEQA Section 15064.5(e), the California Public Resources Code (Sec. 5097.98) and State Health and Safety Code (Section 7050.5) shall be undertaken:

A. Notification

1. Archaeological Monitor shall notify the RE or BI as appropriate, MMC, and the PI, if the Monitor is not qualified as a PI. MMC will notify the appropriate Senior Planner in the Environmental Analysis Section (EAS) of the Development Services Department to assist with the discovery notification process.

2. The PI shall notify the Medical Examiner after consultation with the RE, either in person or via telephone.

B. Isolate discovery site

1. Work shall be directed away from the location of the discovery and any nearby area reasonably suspected to overlay adjacent human remains until a

determination can be made by the Medical Examiner in consultation with the PI concerning the provenance of the remains.

2. The Medical Examiner, in consultation with the PI, will determine the need for a field examination to determine the provenance.

3. If a field examination is not warranted, the Medical Examiner will determine with input from the PI, if the remains are or are most likely to be of Native American origin.

C. If Human Remains **ARE** determined to be Native American

1. The Medical Examiner will notify the Native American Heritage Commission (NAHC) within 24 hours. By law, **ONLY** the Medical Examiner can make this call.

2. NAHC will immediately identify the person or persons determined to be the Most Likely Descendent (MLD) and provide contact information.

3. The MLD will contact the PI within 24 hours or sooner after the Medical Examiner has completed coordination, to begin the consultation process in accordance with CEQA Section 15064.5(e), the California Public Resources and Health & Safety Codes.

4. The MLD will have 48 hours to make recommendations to the property owner or representative, for the treatment or disposition with proper dignity, of the human remains and associated grave goods.

5. Disposition of Native American Human Remains will be determined between the MLD and the PI, and, if:

   a. The NAHC is unable to identify the MLD, OR the MLD failed to make a recommendation within 48 hours after being notified by the Commission; OR;

   b. The landowner or authorized representative rejects the recommendation of the MLD and mediation in accordance with PRC 5097.94 (k) by the NAHC fails to provide measures acceptable to the landowner, THEN,

   c. In order to protect these sites, the Landowner shall do one or more of the following:

      (1) Record the site with the NAHC;

      (2) Record an open space or conservation easement on the site;

      (3) Record a document with the County.

d. Upon the discovery of multiple Native American human remains during a ground disturbing land development activity, the landowner may agree that additional conferral with descendants is necessary to consider culturally appropriate treatment of multiple Native American human remains. Culturally appropriate treatment of such a discovery may be ascertained from review of the site utilizing cultural and archaeological standards. Where the parties are unable to agree on the appropriate treatment measures the human remains and buried artifacts with Native American human remains shall be reinterred with appropriate dignity, pursuant to Section 5.c., above.

D. If Human Remains are **NOT** Native American

1. The PI shall contact the Medical Examiner and notify them of the historic era context of the burial.

2. The Medical Examiner will determine the appropriate course of action with the PI and City staff (PRC 5097.98).

3. If the remains are of historic origin, they shall be appropriately removed and conveyed to the San Diego Museum of Man for analysis. The decision for internment of the human remains shall be made in consultation with MMC, EAS, the applicant/ landowner, any known descendant group, and the San Diego Museum of Man.

V. Night and/or Weekend Work

A. If night and/or weekend work is included in the contract

1. When night and/or weekend work is included in the contract package, the extent and timing shall be presented and discussed at the Precon meeting.

2. The following procedures shall be followed.

   a. No Discoveries
      In the event that no discoveries were encountered during night and/or weekend work, the PI shall record the information on the CSVR and submit to MMC via fax by 8AM of the next business day.

   b. Discoveries
      All discoveries shall be processed and documented using the existing procedures detailed in Sections III - During Construction, and IV – Discovery of Human Remains.

   c. Potentially Significant Discoveries
      If the PI determines that a potentially significant discovery has been made, the procedures detailed under Section III - During Construction shall be followed.

   d. The PI shall immediately contact MMC, or by 8AM of the next business day to report and discuss the findings as indicated in Section III-B, unless other specific arrangements have been made.

B. If night and/or weekend work becomes necessary during the course of construction

   1. The Construction Manager shall notify the RE, or BI, as appropriate, a minimum of 24 hours before the work is to begin.

   2. The RE, or BI, as appropriate, shall notify MMC immediately.

C. All other procedures described above shall apply, as appropriate.

VI. Post Construction

A. Preparation and Submittal of Draft Monitoring Report

1. The PI shall submit two copies of the Draft Monitoring Report (even if negative), prepared in accordance with the Historical Resources Guidelines (Appendix C/D) which describes the results, analysis, and conclusions of all phases of the Archaeological Monitoring Program (with appropriate graphics) to MMC for review and approval within 90 days following the completion of monitoring. **It should be noted that if the PI is unable to submit the Draft Monitoring Report within the allotted 90-day timeframe resulting from delays with analysis, special study results or other complex issues, a schedule shall be submitted to MMC establishing agreed due dates and the provision for submittal of monthly status reports until this measure can be met.**

a. For significant archaeological resources encountered during monitoring, the Archaeological Data Recovery Program shall be included in the Draft Monitoring Report.

b. Recording Sites with State of California Department of Parks and Recreation

   The PI shall be responsible for recording (on the appropriate State of California Department of Park and Recreation forms-DPR 523 A/B) any significant or potentially significant resources encountered during the Archaeological Monitoring Program in accordance with the City's Historical Resources Guidelines, and submittal of such forms to the South Coastal Information Center with the Final Monitoring Report.

2. MMC shall return the Draft Monitoring Report to the PI for revision or, for preparation of the Final Report.

3. The PI shall submit revised Draft Monitoring Report to MMC for approval.

4. MMC shall provide written verification to the PI of the approved report.

5. MMC shall notify the RE or BI, as appropriate, of receipt of all Draft Monitoring Report submittals and approvals.

B. Handling of Artifacts

1. The PI shall be responsible for ensuring that all cultural remains collected are cleaned and catalogued

2. The PI shall be responsible for ensuring that all artifacts are analyzed to identify function and chronology as they relate to the history of the area; that faunal material is identified as to species; and that specialty studies are completed, as appropriate.

3. The cost for curation is the responsibility of the property owner.

C. Curation of artifacts: Accession Agreement and Acceptance Verification

1. The PI shall be responsible for ensuring that all artifacts associated with the survey, testing and/or data recovery for this project are permanently curated with an appropriate institution. This shall be completed in consultation with MMC and the Native American representative, as applicable.

2. The PI shall include the Acceptance Verification from the curation institution in the Final Monitoring Report submitted to the RE or BI and MMC.

3. When applicable to the situation, the PI shall include written verification from the Native American consultant/monitor indicating that Native American

resources were treated in accordance with state law and/or applicable agreements. If the resources were reinterred, verification shall be provided to show what protective measures were taken to ensure no further disturbance occurs in accordance with Section IV – Discovery of Human Remains, Subsection 5.

D. Final Monitoring Report(s)

1. The PI shall submit one copy of the approved Final Monitoring Report to the RE or BI as appropriate, and one copy to MMC (even if negative), within 90 days after notification from MMC that the draft report has been approved.

2. The RE shall, in no case, issue the Notice of Completion and/or release of the Performance Bond for grading until receiving a copy of the approved Final Monitoring Report from MMC which includes the Acceptance Verification from the curation institution.

The above Mitigation Monitoring and Reporting Program will require additional fees and/or deposits to be collected prior to the issuance of building permits, certificates or occupancy and/or final maps to ensure the successful completion of the monitoring program.

VII. SIGNIFICANT UNMITIGATED IMPACTS:

There are no new significant impacts identified for the current project. However, the final EIR for the original project identified significant unmitigated impacts relating to Transportation/Circulation/Parking, Noise, Paleontological Resources, Biological Resources, Health and Safety, and Historical Resources. Because there were significant, unmitigated impacts associated with the original project, approval required the decision maker to make specific and substantiated CEQA Findings which stated that: a) specific economic, social or other considerations made infeasible the mitigation measures or project alternatives identified in the final EIR, and b) these impacts have been found acceptable because of specific overriding considerations. No new CEQA Findings are required with this project.

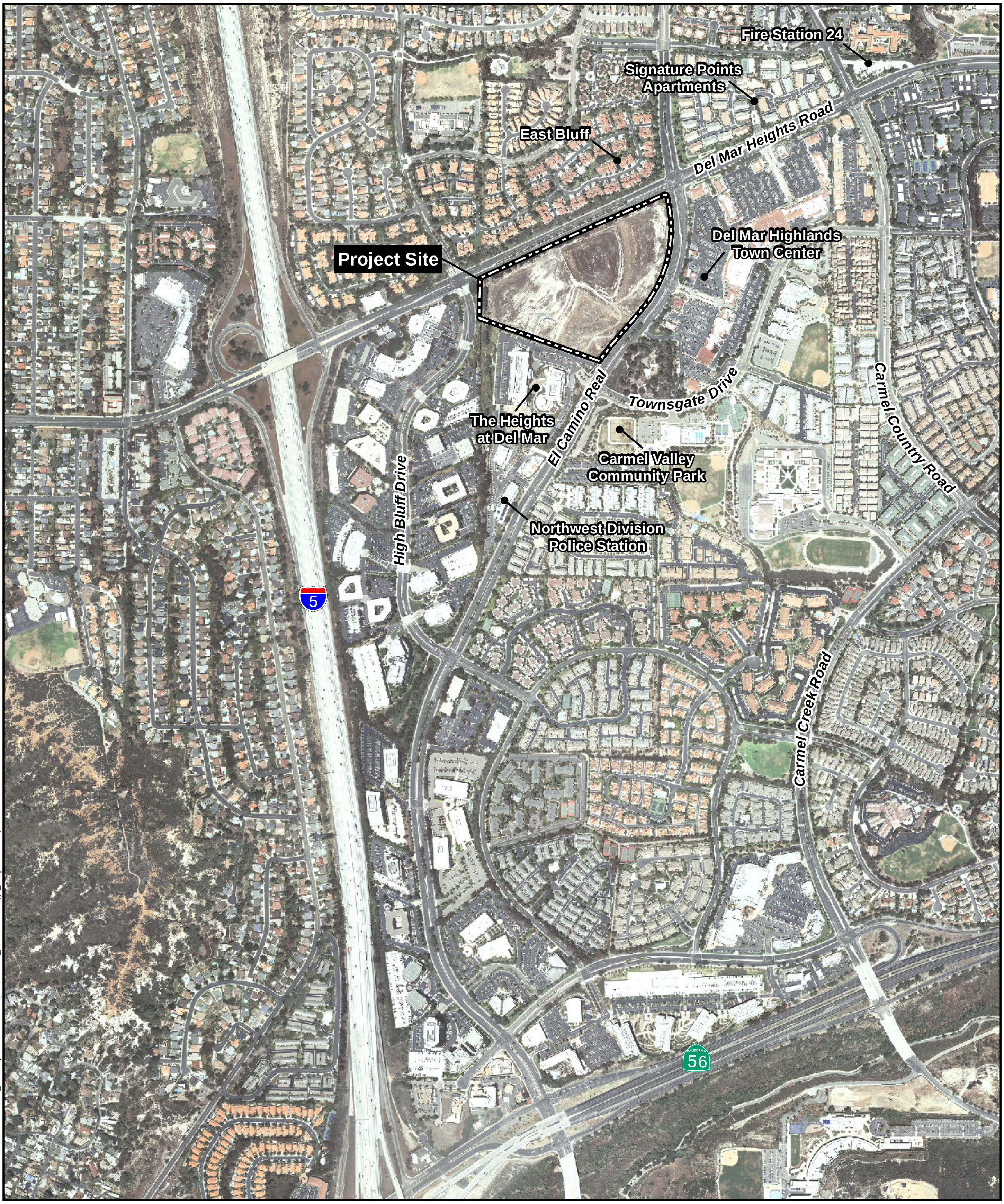
Jeff Szymanski

Jeff Szymanski (for Martha Blake)
Senior Planner
Development Services Department

3/8/2016
Date

Analyst: Martha Blake

Copies of the addendum, the final EIR, the Mitigation Monitoring and Reporting Program, and any technical appendices may be reviewed in the office of the Entitlements Division of the Development Services Department, or purchased for the cost of reproduction.



Project Vicinity Map

NEW ONE PASEO

N 0 1,000 Feet

Figure 1

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Site Plan

NEW ONE PASEO

Figure 2

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Mitigation, Monitoring, and Reporting Program for the New One Paseo Project

GENERAL REQUIREMENTS

As Lead Agency for the proposed project under CEQA, the City of San Diego will administer the Mitigation, Monitoring, and Reporting Program (MMRP) for the following environmental issue areas as identified in the Addendum to the One Paseo Project EIR: Transportation/ Circulation/Parking, Noise, Paleontological Resources, Biological Resources, Health and Safety, and Historical Resources. The mitigation measures identified below include all applicable measures from the Addendum to the One Paseo Project EIR (Project No. 193036; SCH No. 2010051073).

Section 21081.6 to the State of California PRC requires a Lead or Responsible Agency that approves or carries out a project where an EIR has identified significant environmental effects to adopt a “reporting or monitoring program for adopted or required changes to mitigate or avoid significant environmental effects.” The City of San Diego is the Lead Agency for the One Paseo Project EIR, and therefore must ensure the enforceability of the MMRP. An EIR and Addendum has been prepared for this project that addresses potential environmental impacts and, where appropriate, recommends measures to mitigate these impacts. As such, an MMRP is required to ensure that adopted mitigation measures are implemented. Therefore the following general measures are included in this MMRP:

GENERAL REQUIREMENTS – PART I

Plan Check Phase (prior to permit issuance)

1. Prior to the issuance of a Notice To Proceed (NTP) for a subdivision, or any construction permits, such as Demolition, Grading or Building, or beginning any construction related activity on-site, the Development Services Department (DSD) Director’s Environmental Designee (ED) shall review and approve all Construction Documents (CD), (plans, specification, details, etc.) to ensure the MMRP requirements are incorporated into the design.

2. In addition, the ED shall verify that the MMRP Conditions/Notes that apply ONLY to the construction phases of this project are included VERBATIM, under the heading, “**ENVIRONMENTAL/MITIGATION REQUIREMENTS**.”

3. These notes must be shown within the first three (3) sheets of the construction documents in the format specified for engineering construction document templates as shown on the City website:

   http://www.sandiego.gov/development-services/industry/standtemp.shtml

4. The **TITLE INDEX SHEET** must also show on which pages the “Environmental/Mitigation Requirements” notes are provided.

5. **SURETY AND COST RECOVERY –** The Development Services Director or City Manager may require appropriate surety instruments or bonds from private Permit Holders to ensure the long term performance or implementation of required mitigation measures or programs. The City is authorized to recover its cost to offset the salary, overhead, and expenses for City personnel and programs to monitor qualifying projects.

GENERAL REQUIREMENTS – PART II

Post Plan Check (After permit issuance/Prior to start of construction)

1. **PRE CONSTRUCTION MEETING IS REQUIRED TEN (10) WORKING DAYS PRIOR TO BEGINNING ANY WORK ON THIS PROJECT.** The PERMIT HOLDER/OWNER is responsible to arrange and perform this meeting by contacting the CITY RESIDENT ENGINEER (RE) of the Field Engineering Division and City staff from MITIGATION MONITORING COORDINATION (MMC). Attendees must also include the Permit holder's Representative(s) and Job Site Superintendent.

   Note:

   Failure of all responsible Permit Holder's representatives and consultants to attend shall require an additional meeting with all parties present.

   CONTACT INFORMATION:

   a) The PRIMARY POINT OF CONTACT is the **RE** at the **Field Engineering Division – 858-627-3200**
   b) For Clarification of ENVIRONMENTAL REQUIREMENTS, it is also required to call **RE and MMC at 858-627-3360**

2. **MMRP COMPLIANCE:** This Project, Project Tracking System (PTS) #193036 shall conform to the mitigation requirements contained in the associated Environmental Document and implemented to the satisfaction of the DSD's Environmental Designee (MMC) and the City Engineer (RE). The requirements may not be reduced or changed but may be annotated (i.e., to explain when and how compliance is being met and location of verifying proof, etc.). Additional clarifying information may also be added to other relevant plan sheets and/or specifications as appropriate (i.e., specific locations, times of monitoring, methodology, etc.

   Note:

   Permit Holder's Representatives must alert RE and MMC if there are any discrepancies in the plans or notes, or any changes due to field conditions. All conflicts must be approved by RE and MMC BEFORE the work is performed.

3. **OTHER AGENCY REQUIREMENTS:** Evidence of compliance with all other agency requirements or permits shall be submitted to the RE and MMC for review and acceptance prior to the beginning of work or within one week of the Permit Holder obtaining documentation of those permits or requirements. Evidence shall include copies of permits, letters of resolution or other documentation issued by the responsible agency.

4. **MONITORING EXHIBITS:** All consultants are required to submit, to RE and MMC, a monitoring exhibit on a 11x17 reduction of the appropriate construction plan, such as site plan, grading, landscape, etc., marked to clearly show the specific areas including the **LIMIT OF WORK**, scope of that discipline's work, and notes indicating when in the construction schedule that work will be performed. When necessary for clarification, a detailed methodology of how the work will be performed shall be included.

   NOTE:

   Surety and Cost Recovery – When deemed necessary by the Development Services Director or City Manager, additional surety instruments or bonds from the private Permit Holder may be required to ensure the long term performance or implementation of required mitigation measures or programs. The City is authorized to recover its cost to offset the salary, overhead, and expenses for City personnel and programs to monitor qualifying projects.

5. **OTHER SUBMITTALS AND INSPECTIONS:** The Permit Holder/Owner's representative shall submit all required documentation, verification letters, and requests for all associated inspections to the RE and MMC for approval per the following schedule:

Issue Area	***Document Submittal***	***Assoc Inspection/Approvals***
General	Consultant Qualification Letters	Prior to Pre-con Meeting
General	Consultant Const. Monitoring Exhibits	Prior to or at the Pre-con Meeting
Geology	As Graded Soils Report	Geotechnical/fault inspection
Paleontology	Paleontology Reports	Paleontology site observation
Archaeology	Archaeology Reports	Archaeology/Historic site observation
Biology	Biology Reports	Biology inspection
Noise	Acoustical Reports	Noise mitigation features inspection
Traffic	Traffic Reports	Traffic features site observation
Waste Management	Waste Management Reports	Waste management inspections
Bond Release	Request for Bond Release letter	Final MMRP inspections prior to Bond Release Letter

SPECIFIC MMRP ISSUE AREA CONDITIONS/REQUIREMENTS

Transportation/Circulation/Parking

Mitigation Measure 5.2-1: Prior to issuance of the first building permit for an office building, the project applicant shall assure by permit and bond reconfiguration of the median on the Del Mar Heights Road bridge to extend the EB to NB dual left-turn pocket to 400 feet to the satisfaction of the City Engineer and Caltrans. Prior to issuance of the first certificate of occupancy for an office building, the median reconfiguration shall be completed and accepted by the City Engineer or Caltrans.

Mitigation Measure 5.2-1.1: Prior to issuance of the first building permit, the project applicant shall contribute to Caltrans $1,192,500 toward the provision of a third eastbound through lane on the Del Mar Heights Road bridge to the satisfaction of the City Engineer. The project applicant has voluntarily agreed to pay Caltrans an additional $307,500 at that time, an amount in excess of its fair share contribution, for a total payment of $1,500,000. The amount paid in excess of the applicant's fair share contribution is included as a project feature.

Mitigation Measure 5.2-2: (a) Prior to issuance of the first building permit, the project applicant shall assure by permit and bond the widening of the segment of Del Mar Heights Road within City jurisdiction to extend the WB right-turn pocket at the Del Mar Heights Road/I-5 NB on-ramp by 470 feet east of the existing limit line (at intersection) to the satisfaction of the City Engineer. Prior to issuance of the first certificate of occupancy, the widening and lengthening shall be completed and accepted by the City Engineer. (b) Prior to issuance of the first building permit for an office building, the project applicant shall assure by permit and bond the widening of the segment of Del Mar Heights Road to include a second WB to NB right turn lane at the Del Mar Heights Road/I-5 NB on-ramp within Caltrans' jurisdiction to the satisfaction of Caltrans and the City Engineer. Prior to issuance of the first certificate of occupancy for an office building, the widening shall be completed and accepted by Caltrans and the City Engineer. Upon completion of this mitigation measure, one right-turn lane shall extend to the west side of the AT&T building and one right-turn lane shall extend to the east side of the AT&T building.

Mitigation Measure 5.2-3: Prior to issuance of the first building permit, the project applicant shall make a fair-share contribution (2.5 percent) towards the widening of El Camino Real from Via de la Valle to San Dieguito Road to a four-lane Major to the satisfaction of the City Engineer.

Mitigation Measure 5.2-4: Prior to issuance of the first building permit, the project applicant shall make a fair-share contribution (9.7 percent) towards the widening of Via de la Valle from San Andres Drive to El Camino Real (West) to a four-lane Major to the satisfaction of the City Engineer.

Mitigation Measure 5.2-5: Prior to issuance of the first building permit, the project applicant shall assure by permit and bond installation of a traffic signal at the Carmel Creek Road/Del Mar Trail intersection, to the satisfaction of the City Engineer. Prior to issuance of the first certificate of occupancy, the traffic signal shall be completed and accepted by the City Engineer.

Mitigation Measure 5.2-6: Prior to issuance of the first building permit, the project applicant shall assure by permit and bond to the satisfaction of the City Engineer the restriping and signal modification to provide a third NB left-turn lane at the intersection of Del Mar Heights Road and High Bluff Drive, and lengthen the EB left-turn lane by 90 feet and modify the raised median to accommodate this. Prior to issuance of the first certificate of occupancy, the third NB left-turn lane and EB left-turn lane lengthening shall be completed and accepted by the City Engineer.

Mitigation Measure 5.2-7: Prior to issuance of the first building permit, the project applicant shall assure by permit and bond construction of a 200-foot long EB right-turn lane plus appropriate transition at the Del Mar Heights Road/El Camino Real intersection, to the satisfaction of the City Engineer. Prior to issuance of the first certificate of occupancy, the 200-foot long EB right-turn lane shall be completed and accepted by the City Engineer.

Mitigation Measure 5.2-8: Prior to issuance of the first building permit for an office building, the project applicant shall make a fair-share contribution (2.7 percent) towards the widening and re-striping of the EB approach to provide one left, one shared through/left-turn, one through, and two right-turn lanes at the El Camino Real/SR 56 EB on-ramp intersection to the satisfaction of the City Engineer.

Mitigation Measure 5.2-9: Prior to issuance of the first building permit for an office building, the project applicant shall assure by permit and bond construction of the following improvements at the Del Mar Heights Road/I-5 NB ramps to the satisfaction of the City Engineer and Caltrans: (1) widen/re-stripe the I-5 NB off-ramp to include dual left, one shared through/right, and one right-turn lane; (2) widen the segment of Del Mar Heights Road to include a second WB to NB right-turn lane at the Del Mar Heights Road/I-5 NB on-ramp within Caltrans' jurisdiction; and (3) reconfigure the median on the Del Mar Heights Road bridge to extend the EB dual left-turn pocket to 400 feet. Prior to issuance of the first certificate of occupancy for an office building, all improvements in this mitigation measure shall be completed and accepted by the City Engineer and Caltrans.

Mitigation Measure 5.2-10: Prior to issuance of the first building permit for an office building, the project applicant shall make a fair-share contribution (25.5 percent) towards adding an HOV lane to the I-5 SB loop on-ramp to the satisfaction of the City Engineer.

Mitigation Measure 5.2-11: Prior to issuance of the first building permit for an office building, the project applicant shall make a fair-share contribution (31.1 percent) towards widening and restriping to add a HOV lane to the I-5 NB on-ramp to the satisfaction of the City Engineer.

<u>Noise</u>

Mitigation Measure 5.4-1: Prior to issuance of building permits, a noise analysis shall be completed to assess building-specific stationary noise sources and impacts to on-site uses.

Appropriate noise attenuation measures identified in the noise analysis shall be incorporated into the project design to ensure compliance with the Noise Ordinance noise limits for stationary sources (i.e., interior noise levels of 45 dBA L_{EQ} or less for residential and hotel uses; 50 dBA L_{EQ} or less for commercial uses). Methods for ensuring compliant interior noise levels may include, but would not be limited to, the following:

- Installation of roof-top mechanical ventilation and HVAC units on mounts that isolate the building from vibration caused by the machinery;
- In the floors separating residential uses from non-residential uses, use additional thicknesses of building materials and/or materials designed to isolate the residential spaces from vibration generated by non-residential spaces;
- Commercial air handling ducts shall not be routed in or adjacent to interior living space walls without specific plans to address isolation;
- Commercial HVAC systems shall not be mounted over interior living areas without specific plans to address isolation;
- Clusters of residential HVAC systems shall not be mounted directly over residential areas;
- Coolant or large water lines including HVAC water for commercial services shall not be routed in walls adjacent to living areas without specific plans to address isolation;
- Operable windows shall not be located where they look directly at any rooftop HVAC systems in adjacent buildings;
- Elevator shafts shall not be located directly adjacent to living quarters without specific plans to address isolation; and/or
- Commercial spaces for nighttime entertainment shall not have a common floor ceiling to a living space.

Once the project is constructed and in full operation, the developer shall conduct on-site noise measurements to verify that noise planning and attenuation measures identified in the noise analysis have mitigated project noise to levels below those proscribed by the Noise Ordinance noise limits for stationary sources.

Mitigation Measure 5.4-2: Prior to issuance of building permits, an exterior-to-interior noise analysis shall be completed to assess off-site noise sources and impacts to interior on-site residential and commercial uses. Appropriate noise planning and attenuation measures identified in the noise analysis shall be incorporated into the project design to ensure compliance with the General Plan Noise Element Land use - Noise Compatibility Guidelines (i.e., interior noise levels of 45 dBA CNEL or less for residential and hotel uses; 50 dBA CNEL or less for commercial uses). Methods for ensuring compliant interior noise levels may include, but would not be limited to, the following:

- Use of window glazing with an increased sound transmission classification;
- Use of additional thicknesses of interior drywall; and/or
- Use of additional thicknesses of exterior building materials.

Once the project is constructed and in full operation, interior noise measurements shall be conducted to verify that exterior-to-interior noise planning has mitigated project noise levels to ensure compliance with the General Plan Noise Element Land use – Noise Compatibility Guidelines.

Mitigation Measure 5.4-3: Prior to issuance of building permits, an interior noise analysis shall be completed to assess on-site noise sources and impacts to interior on-site residential uses. Appropriate noise planning and attenuation measures identified in the noise analysis shall be incorporated into the project design to ensure compliance with the General Plan Noise Element
Land use - Noise Compatibility Guidelines. Potential noise planning and attenuation measures may include, but are not limited to, the following:

- Commercial air handling ducts shall not be routed in or adjacent to interior living space walls without specific plans to address isolation;
- Commercial HVAC systems shall not be mounted over interior living areas without specific plans to address isolation;
- Clusters of residential HVAC systems shall not be mounted directly over residential areas;
- Coolant or large water lines including HVAC water for commercial services shall not be routed in walls adjacent to living areas without specific plans to address isolation;
- Operable windows shall not be located where they look directly at any rooftop HVAC systems in adjacent buildings;
- Elevator shafts shall not be located directly adjacent to living quarters without specific plans to address isolation;
- Commercial spaces for nighttime entertainment shall not have a common floor ceiling to a living space;
- Limitations upon the use of exterior amplified music systems associated with entertainment such as prohibiting exterior amplified music systems in areas directly adjacent to or below on-site residences, [1] and
- Commercial lease agreements shall include strict enforceable measures to control interior and exterior noise to limit impacts to residential areas.

Once the project is constructed and in full operation, interior noise measurements shall be conducted to verify that interior noise planning has mitigated project noise levels to ensure compliance with the General Plan Noise Element Land use – Noise Compatibility Guidelines.

Mitigation Measure 5.4-4: Whenever excavation occurs within 100 feet of an occupied residential unit within the project, noise attenuation shall be provided sufficient to comply with the Noise Ordinance (i.e., a 12-hour average of greater than 75 dBA L_{EQ}). Potential

[1] This excludes temporary outside amplification systems use for a short-term special event conducted with a separate City special event permit.

attenuation measures include, but are not limited to, use of sound walls, sound blankets, noise attenuation devices/modifications to construction equipment, and use of quieter equipment.

Paleontological Resources

Mitigation Measure 5.8-1: The following shall be implemented:

I. **Prior to Permit Issuance**

A. Entitlements Plan Check

1. Prior to issuance of any construction permits, including but not limited to, the first Grading Permit, Demolition Plans/Permits and Building Plans/Permits or a Notice to Proceed for Subdivisions, but prior to the first preconstruction meeting, whichever is applicable, the ADD Environmental designee shall verify that the requirements for Paleontological Monitoring have been noted on the appropriate construction documents.

B. Letters of Qualification have been submitted to ADD

1. The applicant shall submit a letter of verification to MMC identifying the PI for the project and the names of all persons involved in the paleontological monitoring program, as defined in the City of San Diego Paleontology Guidelines.

2. MMC will provide a letter to the applicant confirming the qualifications of the PI and all persons involved in the paleontological monitoring of the project.

3. Prior to the start of work, the applicant shall obtain approval from MMC for any personnel changes associated with the monitoring program.

II. **Prior to Start of Construction**

A. Verification of Records Search

1. The PI shall provide verification to MMC that a site specific records search has been completed. Verification includes, but is not limited to a copy of a confirmation letter from San Diego Natural History Museum, other institution or, if the search was in-house, a letter of verification from the PI stating that the search was completed.

2. The letter shall introduce any pertinent information concerning expectations and probabilities of discovery during trenching and/or grading activities.

B. PI Shall Attend Precon Meetings

1. Prior to beginning any work that requires monitoring; the Applicant shall arrange a Precon Meeting that shall include the PI, CM and/or Grading Contractor, RE, BI,

if appropriate, and MMC. The qualified paleontologist shall attend any grading/excavation related Precon Meetings to make comments and/or suggestions concerning the Paleontological Monitoring program with the Construction Manager and/or Grading Contractor.

a. If the PI is unable to attend the Precon Meeting, the Applicant shall schedule a focused Precon Meeting with MMC, the PI, RE, CM or BI, if appropriate, prior to the start of any work that requires monitoring.

2. Identify Areas to be Monitored

Prior to the start of any work that requires monitoring, the PI shall submit a PME based on the appropriate construction documents (reduced to 11x17) to MMC identifying the areas to be monitored including the delineation of grading/excavation limits. The PME shall be based on the results of a site specific records search as well as information regarding existing known soil conditions (native or formation).

3. When Monitoring Will Occur

a. Prior to the start of any work, the PI shall also submit a construction schedule to MMC through the RE indicating when and where monitoring will occur.

b. The PI may submit a detailed letter to MMC prior to the start of work or during construction requesting a modification to the monitoring program. This request shall be based on relevant information such as review of final construction documents which indicate conditions such as depth of excavation and/or site graded to bedrock, presence or absence of fossil resources, etc., which may reduce or increase the potential for resources to be present.

III. **During Construction**

A. Monitor Shall be Present During Grading/Excavation/Trenching

1. The monitor shall be present full-time during grading/excavation/trenching activities as identified on the PME that could result in impacts to formations with high and moderate resource sensitivity. **The Construction Manager is responsible for notifying the RE, PI, and MMC of changes to any construction activities such as in the case of a potential safety concern within the area being monitored. In certain circumstances OSHA safety requirements may necessitate modification of the PME.**

2. The PI may submit a detailed letter to MMC during construction requesting a modification to the monitoring program when a field condition such as trenching activities that do not encounter formational soils as previously assumed, and/or

when unique/unusual fossils are encountered, which may reduce or increase the potential for resources to be present.

3. The monitor shall document field activity via the CSVR. The CSVRs shall be faxed by the CM to the RE the first day of monitoring, the last day of monitoring, monthly (**Notification of Monitoring Completion)**, and in the case of ANY discoveries. The RE shall forward copies to MMC.

B. Discovery Notification Process

1. In the event of a discovery, the Paleontological Monitor shall direct the contractor to temporarily divert trenching activities in the area of discovery and immediately notify the RE or BI, as appropriate.

2. The Monitor shall immediately notify the PI (unless Monitor is the PI) of the discovery.

3. The PI shall immediately notify MMC by phone of the discovery, and shall also submit written documentation to MMC within 24 hours by fax or email with photos of the resource in context, if possible.

C. Determination of Significance

1. The PI shall evaluate the significance of the resource.

   a. The PI shall immediately notify MMC by phone to discuss significance determination and shall also submit a letter to MMC indicating whether additional mitigation is required. The determination of significance for fossil discoveries shall be at the discretion of the PI.

   b. If the resource is significant, the PI shall submit a Paleontological Recovery Program (PRP) and obtain written approval from MMC. Impacts to significant resources must be mitigated before ground disturbing activities in the area of discovery will be allowed to resume.

   c. If resource is not significant (e.g., small pieces of broken common shell fragments or other scattered common fossils) the PI shall notify the RE, or BI as appropriate, that a non-significant discovery has been made. The Paleontologist shall continue to monitor the area without notification to MMC unless a significant resource is encountered.

   d. The PI shall submit a letter to MMC indicating that fossil resources will be collected, curated, and documented in the Final Monitoring Report. The letter shall also indicate that no further work is required.

IV. Night and/or Weekend Work

A. If night and/or weekend work is included in the contract

1. When night and/or weekend work is included in the contract package, the extent and timing shall be presented and discussed at the Precon meeting.

2. The following procedures shall be followed.

    a. No Discoveries
    In the event that no discoveries were encountered during night and/or weekend work, The PI shall record the information on the CSVR and submit to MMC via fax by 8 AM on the next business day.

    b. Discoveries
    All discoveries shall be processed and documented using the existing procedures detailed in Sections III - During Construction.

    c. Potentially Significant Discoveries
    If the PI determines that a potentially significant discovery has been made, the procedures detailed under Section III - During Construction shall be followed.

    d. The PI shall immediately contact MMC, or by 8 AM on the next business day to report and discuss the findings as indicated in Section III-B, unless other specific arrangements have been made.

B. If night work becomes necessary during the course of construction

1. The Construction Manager shall notify the RE, or BI, as appropriate, a minimum of 24 hours before the work is to begin.
2. The RE, or BI, as appropriate, shall notify MMC immediately.

C. All other procedures described above shall apply, as appropriate.

V. Post Construction

A. Preparation and Submittal of Draft Monitoring Report

1. The PI shall submit two copies of the Draft Monitoring Report (even if negative), prepared in accordance with the Paleontological Guidelines which describes the results, analysis, and conclusions of all phases of the Paleontological Monitoring Program (with appropriate graphics) to MMC for review and approval within 90 days following the completion of monitoring,

a. For significant paleontological resources encountered during monitoring, the Paleontological Recovery Program shall be included in the Draft Monitoring Report.

b. Recording Sites with the San Diego Natural History Museum

   The PI shall be responsible for recording (on the appropriate forms) any significant or potentially significant fossil resources encountered during the Paleontological Monitoring Program in accordance with the City's Paleontological Guidelines, and submittal of such forms to the San Diego Natural History Museum with the Final Monitoring Report.

2. MMC shall return the Draft Monitoring Report to the PI for revision or for preparation of the Final Report.

3. The PI shall submit revised Draft Monitoring Report to MMC for approval.

4. MMC shall provide written verification to the PI of the approved report.

5. MMC shall notify the RE or BI, as appropriate, of receipt of all Draft Monitoring Report submittals and approvals.

B. Handling of Fossil Remains

1. The PI shall be responsible for ensuring that all fossil remains collected are cleaned and catalogued.

2. The PI shall be responsible for ensuring that all fossil remains are analyzed to identify function and chronology as they relate to the geologic history of the area; that faunal material is identified as to species; and that specialty studies are completed, as appropriate

C. Curation of fossil remains: Deed of Gift and Acceptance Verification

1. The PI shall be responsible for ensuring that all fossil remains associated with the monitoring for this project are permanently curated with an appropriate institution.

2. The PI shall include the Acceptance Verification from the curation institution in the Final Monitoring Report submitted to the RE or BI and MMC.

D. Final Monitoring Report(s)

1. The PI shall submit two copies of the Final Monitoring Report to MMC (even if negative), within 90 days after notification from MMC that the draft report has been approved.

2. The RE shall, in no case, issue the Notice of Completion until receiving a copy of the approved Final Monitoring Report from MMC which includes the Acceptance Verification from the curation institution.

Biological Resources

Mitigation Measure 5.9-1: Prior to the issuance of any authorization to proceed, the ADD Environmental designee shall ensure that the following measures are included as notes in the construction plans and grading plans:

1. If project grading/brush management is proposed in or adjacent to native habitat during the typical bird breeding season (i.e. February 1 - September 15), or an active nest is confirmed, the project biologist shall conduct a pre-grading survey for active nests in the development area and within 300 feet of it, and submit a letter report to MMC prior to the preconstruction meeting.

   A. If active nests are confirmed, the report shall include mitigation in conformance with the City's Biology Guidelines and applicable State and Federal Law (i.e., appropriate follow up surveys, monitoring schedules, construction and noise barriers/buffers, etc.) to the satisfaction of the Assistant Deputy Director (ADD) of the Entitlements Division. Mitigation requirements determined by the project biologist and the ADD shall be incorporated into the project's Biological Construction Monitoring Exhibit (BCME) and monitoring results incorporated in to the final biological construction monitoring report.

   B. If no active nests are confirmed per "A" above, mitigation under "A" is not required.

Health and Safety

Mitigation Measure 5.13-1: Construction permits shall designate staging areas where fueling and oil-changing activities are permitted. No fueling and oil-changing activities shall be permitted outside the designated staging areas. The staging areas, as much as practicable, shall be located on level terrain and away from sensitive land uses such as residences, and schools. Staging areas shall not be located near any stream channels or wetlands. The proposed staging areas shall be identified in the construction site plans, which shall be submitted to the Regional Water Quality Control Board as part of the Notice of Intent to File under the NPDES permit process.

Mitigation Measure 5.13-2: Prior to construction, a Health and Safety Plan shall be prepared and worker training shall be implemented to manage potential health and safety hazards to workers and the public.

<u>Historical Resources</u>

Mitigation Measure 5.14-1: The following measures shall be implemented:

I. **Prior to Permit Issuance**

A. Entitlements Plan Check

1. Prior to issuance of any construction permits, including but not limited to, the first Grading Permit, Demolition Plans/Permits and Building Plans/Permits or a Notice to Proceed for Subdivisions, but prior to the first preconstruction meeting, whichever is applicable, the ADD Environmental designee shall verify that the requirements for Archaeological Monitoring and Native American monitoring have been noted on the appropriate construction documents.

B. Letters of Qualification have been submitted to ADD

1. The applicant shall submit a letter of verification to MMC identifying the PI for the project and the names of all persons involved in the archaeological monitoring program, as defined in the City of San Diego HRG. If applicable, individuals involved in the archaeological monitoring program must have completed the 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training with certification documentation.

2. MMC will provide a letter to the applicant confirming the qualifications of the PI and all persons involved in the archaeological monitoring of the project.

3. Prior to the start of work, the applicant must obtain approval from MMC for any personnel changes associated with the monitoring program.

II. **Prior to Start of Construction**

A. Verification of Records Search

1. The PI shall provide verification to MMC that a site specific records search (¼-mile radius) has been completed. Verification includes, but is not limited to a copy of a confirmation letter from South Coast Information Center, or, if the search was in-house, a letter of verification from the PI stating that the search was completed.

2. The letter shall introduce any pertinent information concerning expectations and probabilities of discovery during trenching and/or grading activities.

3. The PI may submit a detailed letter to MMC requesting a reduction to the ¼-mile radius.

B. PI Shall Attend Precon Meetings

1. Prior to beginning any work that requires monitoring; the Applicant shall arrange a Precon Meeting that shall include the PI, CM and/or Grading Contractor, RE, BI, if appropriate, and MMC. The qualified Archaeologist and Native American Monitor shall attend any grading/excavation related Precon Meetings to make comments and/or suggestions concerning the Archaeological Monitoring program with the Construction Manager and/or Grading Contractor.

    a. If the PI is unable to attend the Precon Meeting, the Applicant shall schedule a focused Precon Meeting with MMC, the PI, RE, CM or BI, if appropriate, prior to the start of any work that requires monitoring.

2. Identify Areas to be Monitored

    a. Prior to the start of any work that requires monitoring, the PI shall submit an AME based on the appropriate construction documents (reduced to 11x17) to MMC identifying the areas to be monitored including the delineation of grading/excavation limits.

    b. The AME shall be based on the results of a site specific records search as well as information regarding existing known soil conditions (native or formation).

3. When Monitoring Will Occur

    a. Prior to the start of any work, the PI shall also submit a construction schedule to MMC through the RE indicating when and where monitoring will occur.

    b. The PI may submit a detailed letter to MMC prior to the start of work or during construction requesting a modification to the monitoring program. This request shall be based on relevant information such as review of final construction documents which indicate site conditions such as depth of excavation and/or site graded to bedrock, etc., which may reduce or increase the potential for resources to be present.

III. **During Construction**

A. Monitor(s) Shall be Present During Grading/Excavation/Trenching

1. The Archaeological Monitor shall be present full-time during all soil disturbing and grading/excavation/trenching activities which could result in impacts to archaeological resources as identified on the AME. **The Construction Manager is responsible for notifying the RE, PI, and MMC of changes to any construction activities such as in the case of a potential safety concern within the area being monitored. In certain circumstances OSHA safety requirements may necessitate modification of the AME.**

2. The Native American consultant/monitor shall determine the extent of their presence during soil disturbing and grading/excavation/trenching activities based on the AME and provide that information to the PI and MMC. If prehistoric resources are encountered during the Native American consultant/monitor's absence, work shall stop and the Discovery Notification Process detailed in Section III.B-C and IV.A-D shall commence.

3. The PI may submit a detailed letter to MMC during construction requesting a modification to the monitoring program when a field condition such as modern disturbance post-dating the previous grading/trenching activities, presence of fossil formations, or when native soils are encountered that may reduce or increase the potential for resources to be present.

4. The archaeological and Native American consultant/monitor shall document field activity via the Consultant Site Visit Record (CSVR). The CSVR's shall be faxed by the CM to the RE the first day of monitoring, the last day of monitoring, monthly (**Notification of Monitoring Completion)**, and in the case of ANY discoveries. The RE shall forward copies to MMC.

B. Discovery Notification Process

1. In the event of a discovery, the Archaeological Monitor shall direct the contractor to temporarily divert all soil disturbing activities, including but not limited to digging, trenching, excavating or grading activities in the area of discovery and in the area reasonably suspected to overlay adjacent resources and immediately notify the RE or BI, as appropriate.

2. The Monitor shall immediately notify the PI (unless Monitor is the PI) of the discovery.

3. The PI shall immediately notify MMC by phone of the discovery, and shall also submit written documentation to MMC within 24 hours by fax or email with photos of the resource in context, if possible.

4. No soil shall be exported off-site until a determination can be made regarding the significance of the resource specifically if Native American resources are encountered.

C. Determination of Significance

1. The PI and Native American consultant/monitor, where Native American resources are discovered shall evaluate the significance of the resource. If Human Remains are involved, follow protocol in Section IV below.

   a. The PI shall immediately notify MMC by phone to discuss significance determination and shall also submit a letter to MMC indicating whether additional mitigation is required.

b. If the resource is significant, the PI shall submit an Archaeological Data Recovery Program (ADRP) which has been reviewed by the Native American consultant/monitor, and obtain written approval from MMC. Impacts to significant resources must be mitigated before ground disturbing activities in the area of discovery will be allowed to resume. **Note: If a unique archaeological site is also an historical resource as defined in CEQA, then the limits on the amount(s) that a project applicant may be required to pay to cover mitigation costs as indicated in CEQA Section 21083.2 shall not apply.**

c. If the resource is not significant, the PI shall submit a letter to MMC indicating that artifacts will be collected, curated, and documented in the Final Monitoring Report. The letter shall also indicate that that no further work is required.

IV. **Discovery of Human Remains**

If human remains are discovered, work shall halt in that area and no soil shall be exported off-site until a determination can be made regarding the provenance of the human remains; and the following procedures as set forth in CEQA Section 15064.5(e), the California Public Resources Code (Sec. 5097.98) and State Health and Safety Code (Section 7050.5) shall be undertaken:

A. Notification

1. Archaeological Monitor shall notify the RE or BI as appropriate, MMC, and the PI, if the Monitor is not qualified as a PI. MMC will notify the appropriate Senior Planner in the Environmental Analysis Section (EAS) of the Development Services Department to assist with the discovery notification process.

2. The PI shall notify the Medical Examiner after consultation with the RE, either in person or via telephone.

B. Isolate discovery site

1. Work shall be directed away from the location of the discovery and any nearby area reasonably suspected to overlay adjacent human remains until a determination can be made by the Medical Examiner in consultation with the PI concerning the provenance of the remains.

2. The Medical Examiner, in consultation with the PI, will determine the need for a field examination to determine the provenance.

3. If a field examination is not warranted, the Medical Examiner will determine with input from the PI, if the remains are or are most likely to be of Native American origin.

C. If Human Remains **ARE** determined to be Native American

1. The Medical Examiner will notify the Native American Heritage Commission (NAHC) within 24 hours. By law, **ONLY** the Medical Examiner can make this call.

2. NAHC will immediately identify the person or persons determined to be the Most Likely Descendent (MLD) and provide contact information.

3. The MLD will contact the PI within 24 hours or sooner after the Medical Examiner has completed coordination, to begin the consultation process in accordance with CEQA Section 15064.5(e), the California Public Resources and Health & Safety Codes.

4. The MLD will have 48 hours to make recommendations to the property owner or representative, for the treatment or disposition with proper dignity, of the human remains and associated grave goods.

5. Disposition of Native American Human Remains will be determined between the MLD and the PI, and, if:

    a. The NAHC is unable to identify the MLD, OR the MLD failed to make a recommendation within 48 hours after being notified by the Commission; OR;

    b. The landowner or authorized representative rejects the recommendation of the MLD and mediation in accordance with PRC 5097.94 (k) by the NAHC fails to provide measures acceptable to the landowner, THEN,

    c. In order to protect these sites, the Landowner shall do one or more of the following:

        (1) Record the site with the NAHC;

        (2) Record an open space or conservation easement on the site;

        (3) Record a document with the County.

    d. Upon the discovery of multiple Native American human remains during a ground disturbing land development activity, the landowner may agree that additional conferral with descendants is necessary to consider culturally appropriate treatment of multiple Native American human remains. Culturally appropriate treatment of such a discovery may be ascertained from review of the site utilizing cultural and archaeological standards. Where the parties are unable to agree on the appropriate treatment measures the human remains and buried artifacts with Native American human remains shall be reinterred with appropriate dignity, pursuant to Section 5.c., above.

D. If Human Remains are **NOT** Native American

1. The PI shall contact the Medical Examiner and notify them of the historic era context of the burial.

2. The Medical Examiner will determine the appropriate course of action with the PI and City staff (PRC 5097.98).

3. If the remains are of historic origin, they shall be appropriately removed and conveyed to the San Diego Museum of Man for analysis. The decision for internment of the human remains shall be made in consultation with MMC, EAS, the applicant/ landowner, any known descendant group, and the San Diego Museum of Man.

V. **Night and/or Weekend Work**

A. If night and/or weekend work is included in the contract

1. When night and/or weekend work is included in the contract package, the extent and timing shall be presented and discussed at the Precon meeting.

2. The following procedures shall be followed.

a. No Discoveries
In the event that no discoveries were encountered during night and/or weekend work, the PI shall record the information on the CSVR and submit to MMC via fax by 8AM of the next business day.

b. Discoveries
All discoveries shall be processed and documented using the existing procedures detailed in Sections III - During Construction, and IV – Discovery of Human Remains.

c. Potentially Significant Discoveries
If the PI determines that a potentially significant discovery has been made, the procedures detailed under Section III - During Construction shall be followed.

d. The PI shall immediately contact MMC, or by 8AM of the next business day to report and discuss the findings as indicated in Section III-B, unless other specific arrangements have been made.

B. If night and/or weekend work becomes necessary during the course of construction

1. The Construction Manager shall notify the RE, or BI, as appropriate, a minimum of 24 hours before the work is to begin.

2. The RE, or BI, as appropriate, shall notify MMC immediately.

C. All other procedures described above shall apply, as appropriate.

VI. **Post Construction**

A. Preparation and Submittal of Draft Monitoring Report

1. The PI shall submit two copies of the Draft Monitoring Report (even if negative), prepared in accordance with the Historical Resources Guidelines (Appendix C/D) which describes the results, analysis, and conclusions of all phases of the Archaeological Monitoring Program (with appropriate graphics) to MMC for review and approval within 90 days following the completion of monitoring. **It should be noted that if the PI is unable to submit the Draft Monitoring Report within the allotted 90-day timeframe resulting from delays with analysis, special study results or other complex issues, a schedule shall be submitted to MMC establishing agreed due dates and the provision for submittal of monthly status reports until this measure can be met.**

   a. For significant archaeological resources encountered during monitoring, the Archaeological Data Recovery Program shall be included in the Draft Monitoring Report.

   b. Recording Sites with State of California Department of Parks and Recreation

   The PI shall be responsible for recording (on the appropriate State of California Department of Park and Recreation forms-DPR 523 A/B) any significant or potentially significant resources encountered during the Archaeological Monitoring Program in accordance with the City's Historical Resources Guidelines, and submittal of such forms to the South Coastal Information Center with the Final Monitoring Report.

2. MMC shall return the Draft Monitoring Report to the PI for revision or, for preparation of the Final Report.

3. The PI shall submit revised Draft Monitoring Report to MMC for approval.

4. MMC shall provide written verification to the PI of the approved report.

5. MMC shall notify the RE or BI, as appropriate, of receipt of all Draft Monitoring Report submittals and approvals.

B. Handling of Artifacts

   1. The PI shall be responsible for ensuring that all cultural remains collected are cleaned and catalogued

2. The PI shall be responsible for ensuring that all artifacts are analyzed to identify function and chronology as they relate to the history of the area; that faunal material is identified as to species; and that specialty studies are completed, as appropriate.

3. The cost for curation is the responsibility of the property owner.

C. Curation of artifacts: Accession Agreement and Acceptance Verification

1. The PI shall be responsible for ensuring that all artifacts associated with the survey, testing and/or data recovery for this project are permanently curated with an appropriate institution. This shall be completed in consultation with MMC and the Native American representative, as applicable.

2. The PI shall include the Acceptance Verification from the curation institution in the Final Monitoring Report submitted to the RE or BI and MMC.

3. When applicable to the situation, the PI shall include written verification from the Native American consultant/monitor indicating that Native American resources were treated in accordance with state law and/or applicable agreements. If the resources were reinterred, verification shall be provided to show what protective measures were taken to ensure no further disturbance occurs in accordance with Section IV – Discovery of Human Remains, Subsection 5.

D. Final Monitoring Report(s)

1. The PI shall submit one copy of the approved Final Monitoring Report to the RE or BI as appropriate, and one copy to MMC (even if negative), within 90 days after notification from MMC that the draft report has been approved.

2. The RE shall, in no case, issue the Notice of Completion and/or release of the Performance Bond for grading until receiving a copy of the approved Final Monitoring Report from MMC which includes the Acceptance Verification from the curation institution.

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~~October 14~~December 8, 2015

Toni Dillon
Economic Research Coordinator
City of San Diego
1222 1st Avenue, Third Floor
San Diego, CA 92101

Re: 2015 Addendum to Retail Market Analysis Conducted for the One Paseo Project

In February 2012 Kosmont Companies ("Kosmont") prepared a Retail Market Analysis ("RMA") included as part of the Draft Environmental Impact Report ("DEIR") for the proposed One Paseo project ("Originally Proposed Project"). In January 2013 Kosmont prepared an addendum to the original RMA primarily to evaluate the reduction in the square footage of the retail component of the then proposed development ("~~Revised~~Approved Project"). Subsequent to the preparation of that addendum, and the approval of the One Paseo project in February 2015 the square footage of the retail component of the proposed project was further reduced. This addendum considers the further reduction in square footage of the retail component of the last revision to the project ("New One Paseo Project"). This document serves as a supplement to the RMA and the 2013 addendum to the RMA, and as such, both should be referred to for additional information and discussions of methodology.

A summary of the gross retail and cinema square footage in each of the three iterations of the project follows in Table 1 below.

Table 1. Land Use Comparison of the New One Paseo Project with the Originally Proposed Project and ~~Revised~~Approved Project
(Gross Square Feet, Retail & Cinema Component Only)

Project	Retail SF
Originally Proposed Project	**220,000**
~~Revised~~Approved Project	**198,500**
New One Paseo Project	**95,871**
Net Change from Originally Proposed Project	**-124,129**
Net Change from ~~Revised~~Approved Project	**-102,629**

As illustrated in Table 1 above, the New One Paseo Project includes 95,871 square feet of retail space. This represents a reduction of 124,129 square feet of retail space from the Originally Proposed Project, and a reduction of 102,629 square feet of retail space from the ~~Revised~~Approved Project.

The initial and follow-on review and analysis for both the Originally Proposed Project and ~~Revised~~Approved Project, concluded that based on the existing and projected retail supply and demand, development of the Originally Proposed Project or the ~~Revised~~Approved Project was not expected to have a significant economic impact on the existing retail establishments within the trade area. Given the substantial reduction in retail square footage of the New One Paseo Project from prior designs Kosmont's conclusion from the initial RMA, and 2013 addendum to the RMA remains unchanged: the New One Paseo Project is not expected to have an adverse impact on the existing GAFO, Food, or Eating and Drinking retail establishments. Further, based on Kosmont's evaluation of existing and projected retail market, an even greater positive net demand for these types of retail uses is projected for the New One Paseo Project.

When net demand exists, market conditions are generally favorable for retail businesses, and as a result, retailers will not be forced to close for reasons related to insufficient demand caused by the proposed development. Should existing businesses close, it would likely occur on an intermittent/site-specific basis, and primarily for operating or demand factors primarily unique to those businesses. Further, as market conditions remain favorable based on the net demand for additional retail square footage, it is unlikely that the proposed development will cause significant business closures and long-term vacancies, causing property owners to cease maintaining their properties and leave decaying, unoccupied shells.

Kosmont is available to discuss its findings and conclusions at your convenience.

Very Truly Yours,

Larry Kosmont
President & CEO

The analyses, projections, assumptions, rates of return, and any examples presented herein are for illustrative purposes and are not a guarantee of actual and/or future results. Project pro forma and tax analyses are projections only. Actual results may differ materially from those expressed in this analysis.

LINSCOTT
LAW &
GREENSPAN
engineers

TRAFFIC ANALYSIS ADDENDUM

NEW ONE PASEO PROJECT

San Diego, California
February 10, 2016

LLG Ref. 3-10-1999

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NEW ONE PASEO PROJECT

San Diego, California
February 10, 2016

1.0 INTRODUCTION AND PURPOSE

1.1 Introduction

The One Paseo EIR was certified by the City Council on February 23, 2015, including all the traffic analyses. The 1.8 million Square Foot (SF) project studied in the EIR included office, hotel, residential and retail uses generating 26,691 ADT. The EIR analyzed a 1.4 million SF project alternative without a hotel, which would generate 23,854 ADT. This alternative project was approved by the City Council. The City's approval was challenged in court. Subsequent to that approval, the project has been reduced in scope to include significantly less retail and office space. The total trip generation for the 1.176 million SF New One Paseo is 13,468 ADT, an approximate 43% reduction in trips from the project approved by the City, and an approximately 50% reduction in ADT from the *Originally Proposed Project* analyzed in the EIR. Since the total number of trips is less, both on a daily and peak hour basis and the trip distribution would remain the same, no new traffic impacts will occur.

The New One Paseo Project is planned to be built in a single phase. Except for the Del Mar Heights Road / High Bluff Drive intersection, the mitigation recommended at all other locations would remain unchanged other than the calculated fair share percentages. The analysis also shows that one signalized access on Del Mar Heights Road would be sufficient to accommodate project traffic, as opposed to the two signals recommended in the approved EIR.

As outlined in this report, the *New One Paseo* Project generates 10,385 less ADT as compared to the *Approved* Project. Since the *New One Paseo* Project generates less traffic, the results and conclusions of the *Approved* EIR traffic studies remain applicable to the *New One Paseo* Project and the mitigation measures identified in the *Originally Proposed Project* traffic study would be equally effective in mitigating impacts due the *New One Paseo* Project. Consequently, with regard to traffic impacts, there are no Project changes that would necessitate a subsequent EIR pursuant to CEQA Guidelines section 15162.

The following sections are included in this report.

- Project Description
- Project Study Area and Analysis Scenarios
- Project Access
- Trip Generation/Distribution/Assignment and Project Volumes
- Analysis of Near-Term Scenarios
- Analysis of Long-Term Scenarios

- Queuing Analysis
- Mitigation Measures
- Fair Share Calculations
- Conclusions

1.2 Purpose

This traffic study Addendum addresses the new development proposal for the One Paseo project ("New One Paseo Project"). The focus of the addendum is to determine whether the analysis and conclusions contained in the original Final Environmental Impact Report (FEIR) for the One Paseo project remain applicable to the New One Paseo Project. In addition, this Addendum evaluates the mitigation measures included in the adopted Mitigation Monitoring and Reporting Program (MMRP) to confirm their applicability to the New One Paseo Project.

As part of a settlement agreement between Kilroy and litigants challenging the City's approval, it was agreed that the applicant would conduct an analysis to determine if certain previously approved traffic mitigation measures could be eliminated or reduced due to a significant reduction in project land use intensity. This addendum to the previously approved traffic analyses addresses that issue, and, whether any conditions exist requiring the preparation of additional traffic analyses pursuant to CEQA Guidelines Section 15162 regarding the preparation of subsequent EIRs.

2.0 PROJECT DESCRIPTION

2.1 Background

The original report evaluated a development proposal consisting of 1,857,444 gross square feet (GSF) including residential, retail, office and hotel uses. For purposes of this addendum, this development proposal is referred to the *Originally Proposed Project*. Subsequently, a redesigned project was included in the EIR as the "Reduced Main Street Alternative" (also referred to as the *Approved Project*). The project was redesigned to reduce the development to 1,454,069 GSF. The major changes included elimination of the hotel, reduction in square footage (SF) of residential, retail and office uses, and the addition of green space. Although the traffic impacts of the *Approved* 1,454,069 SF project were less than those of the *Original* 1,857,440 SF project, the developer chose to retain all of the mitigation measures required for the *Originally Proposed Project* and this was carried through the approvals.

Figure 2–1 depicts the *New One Paseo* Project conceptual site plan.

2.2 Project Description

The New One Paseo Project retains the residential, retail and office uses but eliminates the green space that was included in the *Approved* Project. The total number of residential units would remain 608, although the residential square footage would be reduced from the Originally Proposed Project. However, the square footage of retail and office uses would be reduced from both the *Original* and *Approved* Projects for a total of 1,175,871 SF.

Table 2–1 compares the land uses for the *Originally Proposed, Approved and New One Paseo* Projects.

TABLE 2–1
LAND USE COMPARISON

Land Use	Originally Proposed Project	Approved Project	New One Paseo Project	# of Units
Office	557,440 SF	492,840 SF	280,000 SF	--
Retail	270,000 SF	246,500 SF	95,871 SF	--
Hotel	100,000 SF	--	--	
Residential	930,000 SF	714,729 SF	800,000 SF	608
Total	**1,857,440 SF**	**1,454,069 SF**	**1,175,871 SF**	**608**

General Notes:

a. A hotel was proposed in the *Originally Proposed Project*, but not in the *Approved Project* or the *New One Paseo Project*.
b. Green space is included in the *Approved Project*.

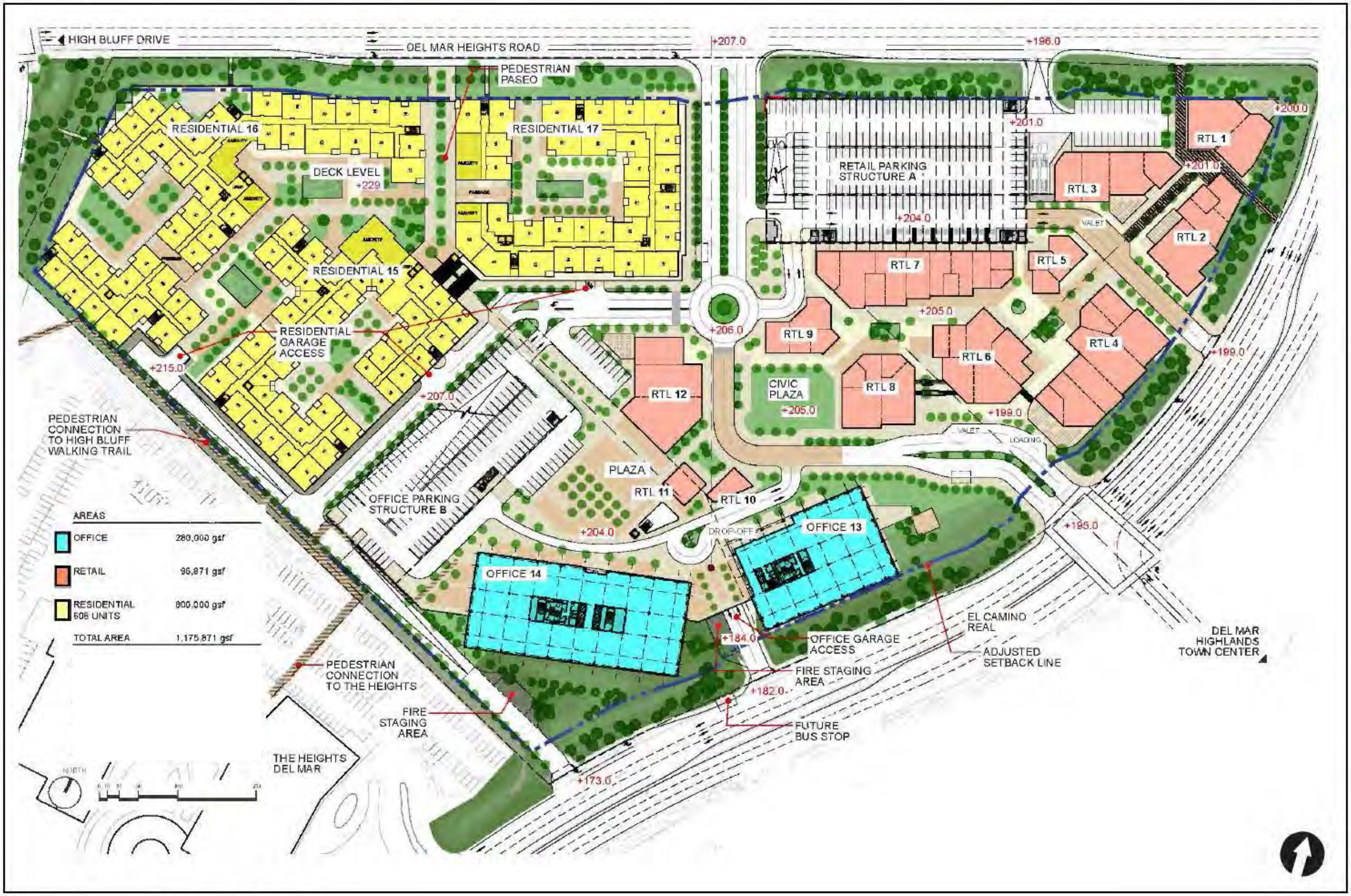

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Figure 2-1

Site Plan

ONE PASEO

3.0 Existing Conditions, Project Study Area and Analysis Scenarios

3.1 Existing Conditions

Existing conditions and traffic volumes as well as Year 2030 baseline volumes were obtained from the *Original* One Paseo Traffic Impact Analysis dated March 23, 2012. Traffic counts from this Impact Analysis are used in this Addendum report, since the baseline conditions would remain unchanged for this Addendum. As described previously, the purpose of this analysis is to determine if certain impacts / mitigations could be eliminated as a result of the now proposed New One Paseo Project generating approximately 10,000 fewer daily trips. Thus, no new traffic counts were conducted.

The following figures from the March 23, 2012 report and the traffic count sheets are included in ***Appendix A*** for reference. The volumes shown in these figures apply to the analysis in this report.

- Figure 5-1, Existing Average Daily Traffic
- Figure 5-2, Existing Lane Configurations
- Figure 5-3, Existing AM/PM Peak Hour Traffic
- Figure 3-1, Project Only Distribution Percentages
- Figure 8-1, Near-Term Without Project Average Daily Traffic Volumes
- Figure 8-2, Near-Term Without Project AM / PM Peak Traffic Volumes
- Figure 12-1, Year 2030 Without Project Average Daily Traffic Volumes
- Figure 12-2, Year 2030 Without Project AM / PM Peak Hour Traffic Volumes

In addition to the above, the following attachments from the Del Mar Highlands Town Center Expansion (DMHTC) – Near-Term Analysis Memo prepared by USA, Inc. dated January 22, 2015. This January 22, 2015 memo included a 100,000 SF expansion of the DMHTC expected to generate 7,000 ADT driveway trips and 4,900 ADT cumulative trips as part of the *New One Paseo* near-term without project scenario. The following are included in *Appendix A.*

- Attachment 2, DMHTC Expansion Trip Generation,
- DMHTC Project Traffic Distribution
- DMHTC Project Only Average Daily Traffic assignment
- DMHTC Project Only (DMHTC Expansion) AM/PM Peak Hour Traffic

3.2 Project Study Area

As mentioned in the introduction of this report, since there is an approved traffic study for the larger *Approved* One Paseo project, the study area for this report focuses on the locations at which a significant impact was previously calculated and where a reduction in physical mitigation is possible. A reduction in physical mitigation is not being pursued at the Del Mar Heights Road / El Camino Real intersection, nor along the segment of Del Mar Heights Road between High Bluff Drive and El Camino Real and hence they are not included in this review.

The following locations were reviewed. A reduction in physical mitigation is not proposed at any other locations:

Intersections

- I-5 NB Ramps / Del Mar Heights Road
- High Bluff Drive / Del Mar Heights Road

Segments

- Del Mar Heights Road: I-5 SB Ramps to I-5 NB Ramps
- Del Mar Heights Road: I-5 NB Ramps to High Bluff Drive

3.3 Analysis Scenarios

The following scenarios were analyzed. These are the same scenarios that were analyzed in the approved study.

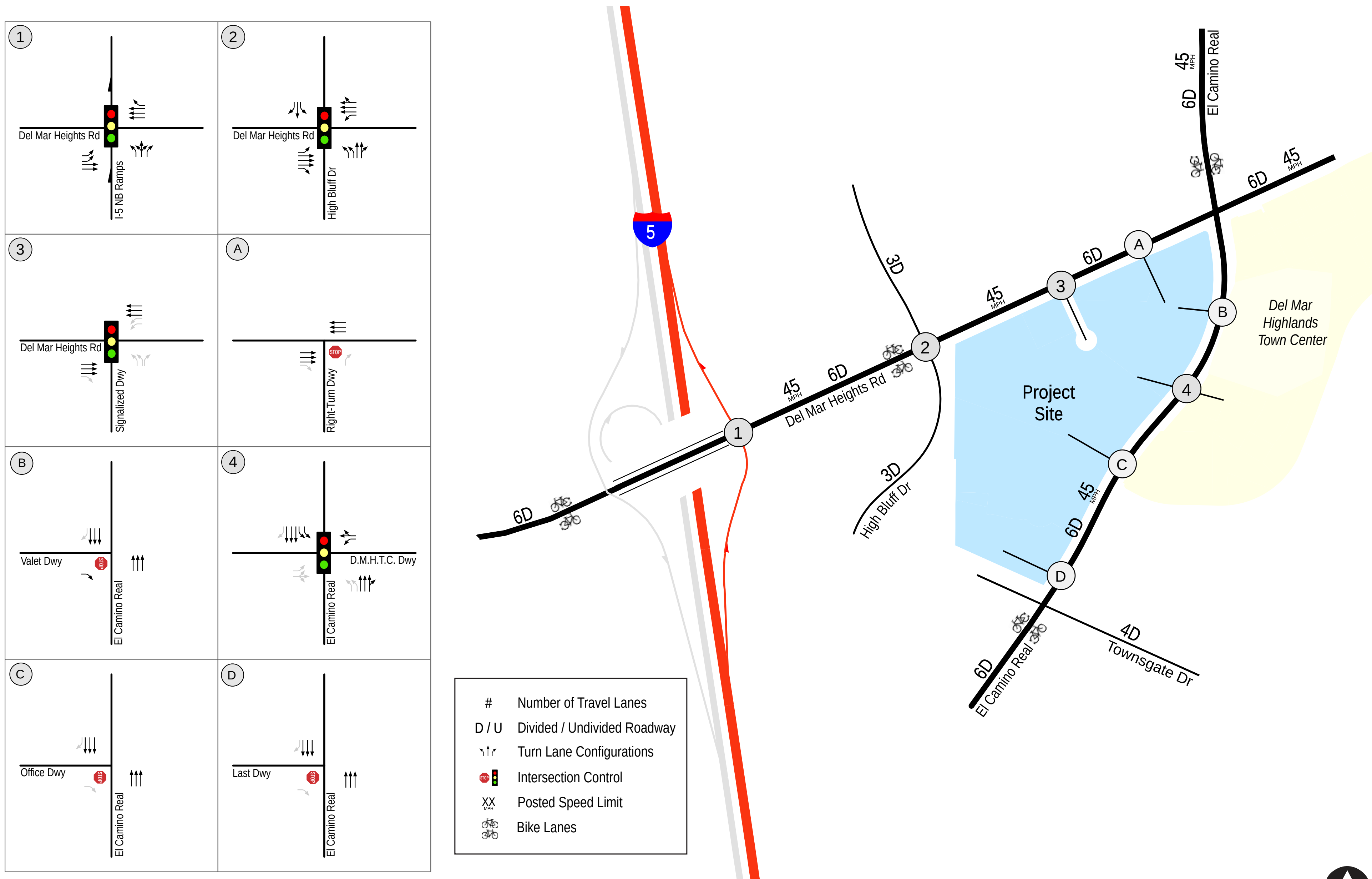
NEAR-TERM

- Existing
- Existing with Project
- Near-Term Without Project
- Near-Term With Project (Opening Year 2017)

LONG-TERM

- Year 2030 without Project
- Year 2030 with Project

Figure 3–1, depicts the Existing Conditions and ***Figure 3–2*** depicts the Existing Traffic Volumes.



Note: Future Project Driveway geometries shown in grayscale.

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Figure 3-1

Existing Conditions Diagram

ONE PASEO

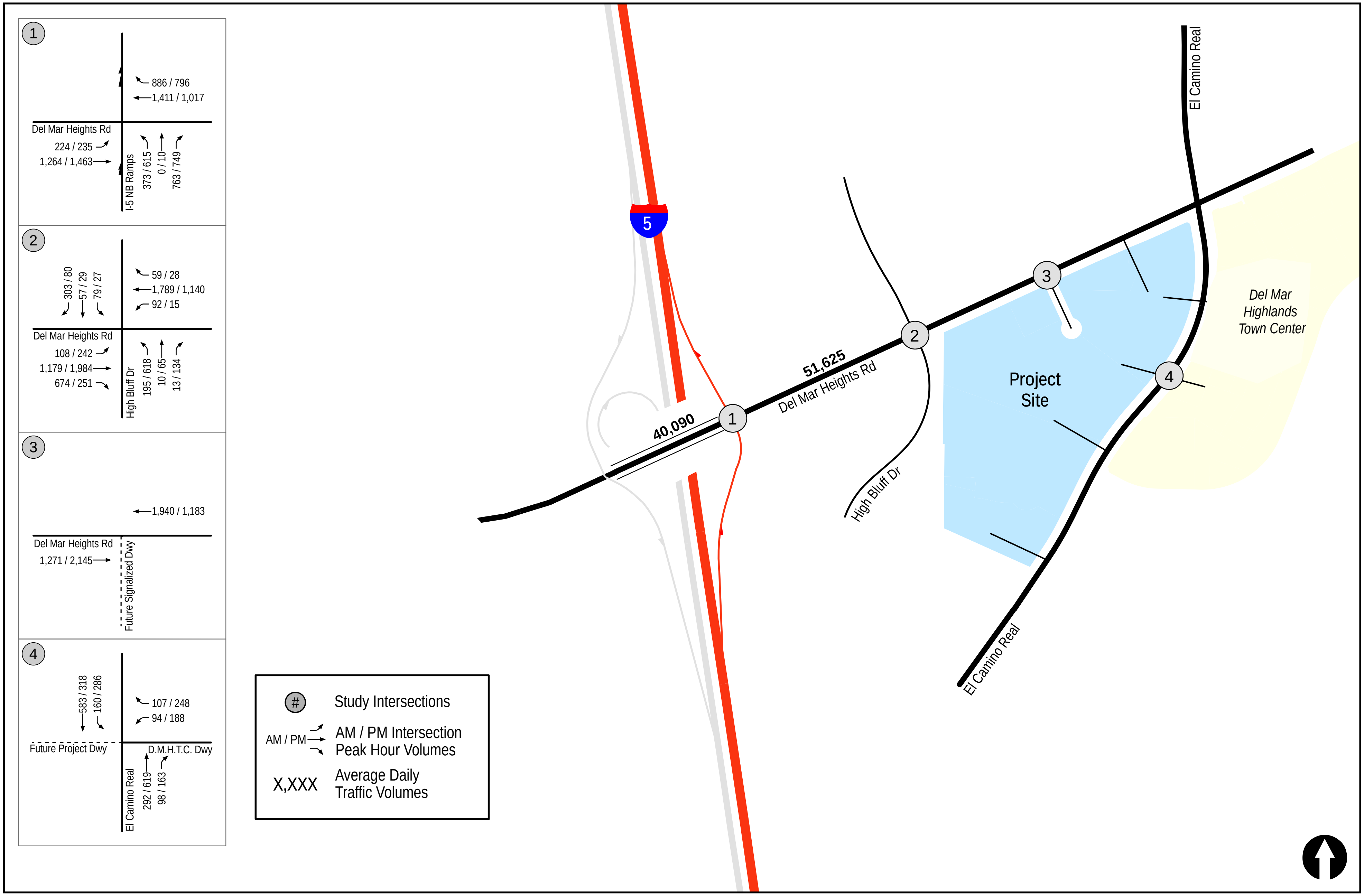

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Figure 3-2

Existing Traffic Volumes

ONE PASEO

4.0 PROJECT ACCESS

Access to the site is proposed via two driveways on Del Mar Heights Road and four (4) driveways on El Camino Real, consistent with that which was proposed in the approved EIR. The currently planned access is shown in *Figure 3-1*. The main difference in access associated with the New One Paseo Project is that one of the previously signalized Del Mar Heights Road driveways is now proposed to be unsignalized and limited to right-in/right-out turns only. In addition, the two access points are located slightly further east than was proposed in the *Originally Proposed Project*. This access scheme is calculated to operate adequately to City LOS standards as shown in *Tables 6—1* and *6—3*, where LOS C is calculated at both signalized access points. The lane configuration at the El Camino Real signalized access and at other access points on El Camino Real are unchanged from the approved EIR.

The lane configuration at the Del Mar Heights Road project access signal should include dual westbound left-turn lanes, a dedicated eastbound right-turn lane and three northbound approach lanes (2 left and 1 right) in order to maximize green time on Del Mar Heights Road.

As shown in ***Figure 4-1***, the spacing of the driveways on Del Mar Heights Road is as follows:

- High Bluff Drive to Signalized Driveway – 840 feet
- Signalized Driveway to Right-Turn Driveway – 328 feet
- Right-Turn Driveway to El Camino Real – 321 feet

The spacing of the driveways on El Camino Real is as follows:

- El Camino Real to Driveway #1– 389 feet
- Driveway #1 to Del Mar Highlands Town Center – 226 feet
- Del Mar Highlands Town Center to Driveway #2 – 416 feet
- Driveway #2 to Driveway #3 – 230 feet

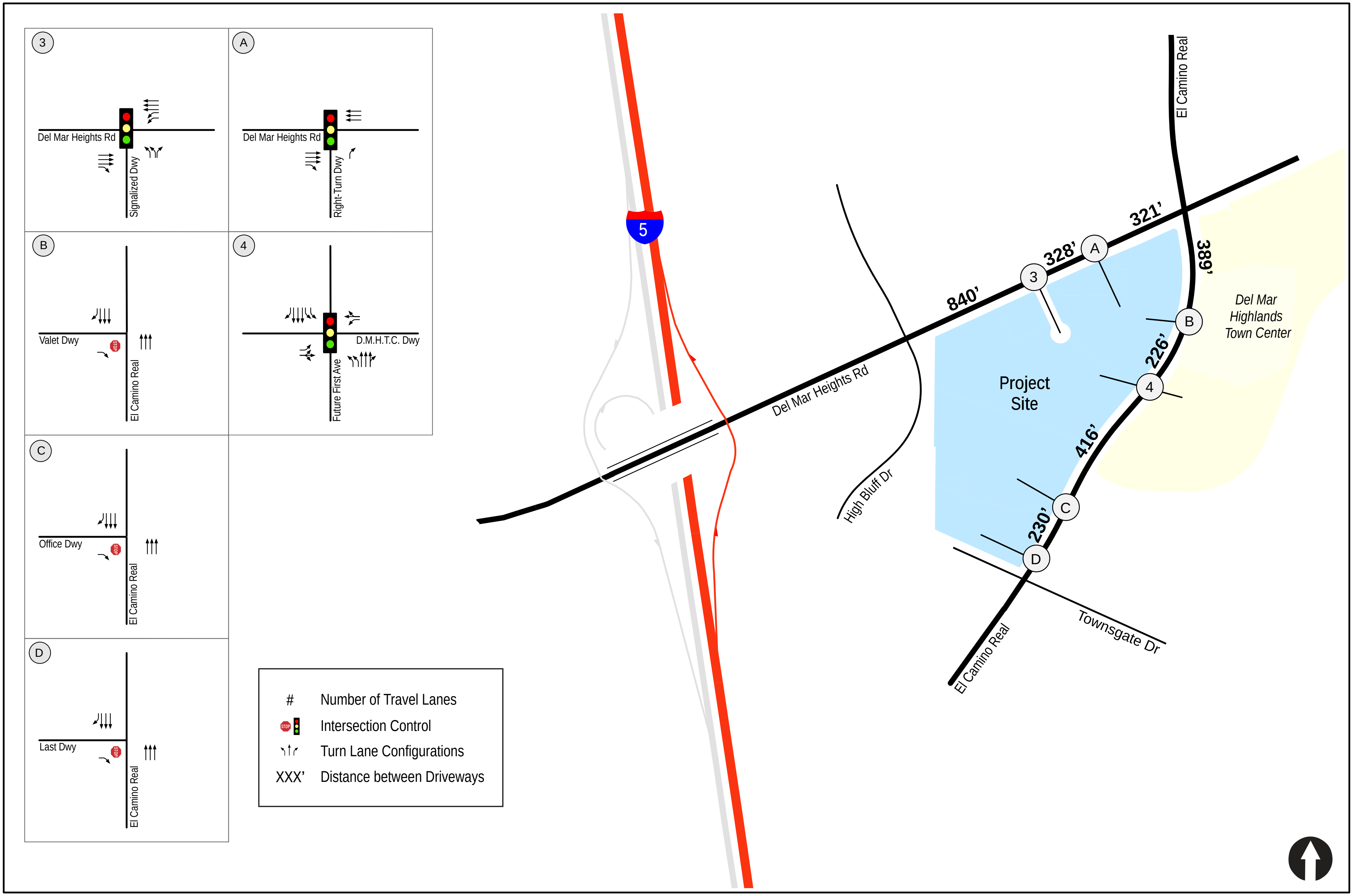

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Figure 4-1

Project Driveway Geometry

ONE PASEO

5.0 TRIP GENERATION / DISTRIBUTION / ASSIGNMENT AND PROJECT VOLUMES

5.1 Project Trip Generation

The Project land uses have been revised to include 280,000 Square Feet (SF) of multi-tenant office, 608 dwelling unit multi-family residential, 95,871 SF retail. ***Table 5–1*** summarizes the estimated *New One Paseo Project* trip generation. The trip rates from the Land Development Code, Trip Generation Manual, May 2003, City of San Diego were used to estimate the project trip generation. Since the proposed project has several land uses, mixed use reductions were applied, using the same percentages used in the *Original* and *Approved* Project Traffic studies, and as prescribed in the City of San Diego Traffic Impact Study Manual, July 1998.

5.1.1 *Driveway Trips*

With the mixed-use reduction, the *New One Paseo* Project is estimated to generate a total of 17,879 daily Driveway trips with 1,136 AM peak hour trips (710 inbound and 426 outbound) and 2,029 PM peak hour trips (932 inbound and 1,097 outbound). These trips are assigned to the project driveways.

5.1.2 *Cumulative Trips*

With the mixed-use reduction and application of the City of San Diego Cumulative trip rates, to account for passby trips, the *New One Paseo* Project is estimated to generate a total of 13,468 daily Cumulative trips (new trips to the street system) with 971 AM peak hour trips (611 inbound and 360 outbound) and 1,546 PM peak hour trips (690 inbound and 856 outbound).

5.2 Trip Generation Comparison – Originally Proposed Project and Proposed Project

Table 5−2 summarizes the trip generation for the *Originally Proposed Project*. As seen, when comparing *Tables 5−1 & 5−2*, the total estimated cumulative project trips for the *New One Paseo* Project is 13,468, a reduction of 50% over that of the *Originally Proposed Project* of 26,961. The total AM peak hour trips are 971, a reduction of 37% over that of the *Originally Proposed Project* of 1,537 and the PM peak hour trips are 1,546, a reduction of 47% over that of the *Originally Proposed Project* of 2,931.

TABLE 5–1
NEW ONE PASEO TRIP GENERATION SUMMARY

Land Use	Quantity	Rate [a]	ADT	AM Peak Hour					PM Peak Hour				
				Rate	**In:Out**	**In**	**Out**	**Total**	**Rate**	**In:Out**	**In**	**Out**	**Total**
Multi-Tenant Office	280,000 SF	Ln(T)=0.756Ln (X) + 3.95	3,677	13%	9:1	430	48	478	14%	2:8	103	412	515
Mixed Use Reduction		3%	-110	5%	9:1	-22	-2	-24	4%	2:8	-4	-17	-21
Net Commercial Office			*3,567*			*408*	*46*	*454*			*99*	*395*	*494*
Multi-Family Residential	608 DU	6 /DU	3,648	8%	2:8	58	234	292	10%	7:3	256	109	365
Mixed Use Reduction		10%	-365	8%	2:8	-5	-18	-23	10%	7:3	-26	-11	-37
Net Residential			*3,283*			*53*	*216*	*269*			*230*	*98*	*328*
Retail	95,871 SF	120 /KSF	11,505	4%	6:4	276	184	460	11%	5:5	633	632	1,265
Mixed Use Reduction		[b]	-475			-27	-20	-47			-28	-30	-58
Net Retail (Driveway)			*11,029*			*249*	*164*	*413*			*605*	*602*	*1,207*
Passby Reduction [c]		*40%*	-4,412	*40%*	6:4	-99	-66	-165	40%	5:5	-242	-241	-483
Net Retail (Cumulative)			*6,618*			*150*	*98*	*248*			*363*	*361*	*724*
Total Driveway Trips			**17,879**			**710**	**426**	**1,136**			**932**	**1,097**	**2,029**
Net Cumulative Trips (Net Trips added to Street System)			**13,468**			**611**	**360**	**971**			**690**	**856**	**1,546**

Footnotes:

a. *Land Development Code, Trip Generation Manual*, May 2003, City of San Diego

b. Commercial reduction is the sum of office and residential reduction in numbers per Table 4, Recommended Trip Reductions for Mixed-Use Developments Which include Commercial Retail, City of San Diego Traffic Impact Study Manual, July 1998. Table 4 applies for retail of more than 100,000 SF, but this rate is used here due to the proximity of other neighborhood serving retail across El Camino Real.

c. Passby reduction based on the cumulative trip rate of 72 trips in the City of San Diego *Trip Generation Manual*, which is a 40% reduction.

General Notes:

DU - Dwelling Units
KSF - 1,000 Square Feet

TABLE 5–2
ORIGINALLY PROPOSED PROJECT TRIP GENERATION SUMMARY

Land Use	Quantity	Rate [a]	ADT	AM Peak Hour					PM Peak Hour				
				%*	In:Out	In	Out	Total	%*	In:Out	In	Out	Total
Corporate Office	245,000 SF	10 /KSF	2,450	15%	9:1	331	37	368	15%	1:9	37	331	368
Multi-Tenant Office	291,000 SF	Ln(T)=0.756Ln (X) + 3.95	3,786	13%	9:1	443	49	492	14%	2:8	106	424	530
Gross Office Trips			**6,236**			**774**	**86**	**860**			**143**	**755**	**898**
Commercial Office Reduction		3%	-187	5%	9:1	-39	-4	-43	4%	1:9	-5	-31	-36
Net Office Trips			*6,049*			*735*	*82*	*817*			*138*	*724*	*862*
Hotel	150 Rooms	10 /Room	1,500	6%	6:4	54	36	90	8%	6:4	72	48	120
Multi-Family Residential	608 DU	6 /DU	3,648	8%	2:8	58	234	292	10%	7:3	256	109	365
Gross Residential Trips			**5,148**			**112**	**270**	**382**			**328**	**157**	**485**
Mixed Use Reduction		10%	-515	8%	2:8	-9	-22	-31	10%	7:3	-33	-16	-49
Net Residential Trips			*4,633*			*103*	*248*	*351*			*295*	*141*	*436*
Community Center	220,000 SF	Blended Rate **	14,781	3%	6:4	266	177	443	10%	5:5	739	739	1,478
Cinema (50,000 SF)	10 Screens	220 /Screen	2,200	0.0%	0:0	0	0	0	10.9%	41:59	98	142	240
Gross Retail Trips			**16,981**			**266**	**177**	**443**			**837**	**881**	**1,718**
Commercial Retail Reduction (Commercial Office + Residential)			-702			-48	-26	-74			-38	-47	-85
Net Commercial Trips			*16,279*			*218*	*151*	*369*			*799*	*834*	*1,633*
Total Driveway Trips			**28,365**			**1,152**	**533**	**1,685**			**1,308**	**1,793**	**3,101**
Net Cumulative Trips (Net Trips added to Street System)			**26,961**			**1,056**	**481**	**1,537**			**1,232**	**1,699**	**2,931**

Source: Original One Paseo EIR, March 23, 2012.

Footnotes:

* = Source: City of San Diego Trip Generation Manual, May 2003.

** = Blended Rate: 100,650sf @ 40/ksf=4,026 ADT & 30,000sf @ 150/sf = 4,500 ADT & 89,350sf @70/sf=6,255 ADT, so the total is 14,781 ADT.

DU = Dwelling Unit

KSF = 1,000 Square Foot

5.3 Trip Generation Comparison – Approved Project and Proposed Project

Table 5−3 summarizes the trip generation for the *Approved Project*. As seen, when comparing *Tables 5−1 & 5−3***,** the total estimated cumulative project trips for the *New One Paseo* Project is 13,468, a reduction of 43% over that of the *Approved* Project of 23,853. The total AM peak hour trips are 971, a reduction of 30% over that of the *Approved* Project of 1,377 and the PM peak hour trips are 1,546, a reduction of 40% over that of the *Approved* Project of 2,568.

5.4 Trip Distribution/Assignment

Project traffic was assigned to the street system using the trip distribution in the *Original* Project Traffic Study, shown on ***Figure 5-1***. Regional trip distribution is the same as Figure 3-1 from the *Original Report* which is included in *Appendix A*. Project traffic assignment is depicted on ***Figure 5-2***.

The project *Driveway* and *Cumulative* trips were assigned based on the percentages on *Figure 5-1*. The cumulative trips are assigned to all study area intersections except the project driveways and the Driveway trips are assigned to the project driveways. The distribution of project traffic at the two Del Mar Heights Road driveways are as follows:

As with the *Original* Report, the distribution shown in *Figure 5-1* was used for each land use type. Since only intersection #3 is signalized and only right-in / right-out turns are permitted at intersection #A, inbound and outbound left-turn movements are possible at only intersection #3. Thus, project traffic distribution / assignment was developed based on the movements permitted at intersections #3 and #A and is described below:

PROJECT INBOUND TRAFFIC

- All (29%) inbound westbound left-turn traffic (from the east) occurs at Intersection **#3**
- 20% of the inbound (eastbound) traffic from the west occurs at Intersection **#3**
- 13% of the inbound (eastbound) traffic from the west occurs at Intersection **#A**
- 12% of the inbound (eastbound) traffic from the west continues on to **El Camino Real**.

PROJECT OUTBOUND TRAFFIC

- All (33%) outbound (westbound) left-turn traffic (from the project site) occurs at Intersection **#3**
- 10% of the outbound (eastbound) from the project site occurs at Intersection **#3**
- 19% of the outbound (eastbound) from the project site occurs at Intersection **#A**

5.5 Near-Term Cumulative Traffic Volumes

The Cumulative projects assignment was obtained from the *Original* Project Traffic Study. As explained in the Approved Project Report, Near-Term without project traffic volumes were obtained as follows:

- Ten (10) projects were identified in the project vicinity.
- Traffic generated by these 10 projects were assigned to the project study area
- A 3% growth factor was applied to the Existing traffic volumes
- The Cumulative project traffic volumes were added to the existing traffic volumes with the 3% growth to obtain the near-term without project traffic volumes, *Figures 8-1* (Daily) and *8-2* (AM / PM peak hour) of the Approved Project report.

The current Del Mar Highlands Town Center Expansion (DMHTC) project was not included in the *Original* Project Traffic Study. An analysis with this project (assumed to be 100,000 sf of retail) was included in the E-Memo *Del Mar Highlands Town Center Expansion - Near Term Analysi*s by Urban Systems Associates, January 22, 2015. Based on this E-memo, traffic generated by the additional 100,000 SF of retail at the proposed Del Mar Highlands Town Center was included in this near-term cumulative analysis. The January 22, 2015 analysis assumed 7,000 ADT driveway trips and 4,900 ADT cumulative trip generation for 100,000 SF of retail. The Trip Generation table for the Del Mar Highlands Town Center Expansion Project is included in *Appendix A.*

Appendix A also contains Attachments 2 and 3 depicting the segment and the peak hour intersection volumes for the DHMTC project from the above mentioned E-Memo.

The following figures are included in this section:

- ***Figure 5–1***, Project Traffic Distribution – The regional Project traffic distribution percentages shown on this figure are the same as indicated in *Figure 3-1* of the *Original Project* Report, and included in *Appendix A*.
- ***Figure 5–2***, Project Traffic Assignment – The New Paseo One Project trips shown in *Table 5-1* were assigned based on the distribution percentages shown on *Figure 5-1* above and are shown on this figure.
- ***Figure 5–3***, Total Cumulative Projects + 3% Growth Traffic Volumes – First, a growth factor of 3% was applied to the existing traffic volumes (*Figure 3-2*). The cumulative projects traffic volumes were then added. In addition, the traffic volumes generated by the Del Mar Highlands Town Center Expansion (Attachment 3 of the E-Memo dated January 22, 2015) was added, to obtain the total Cumulative project volumes shown on this figure.

5.6 Long-Term 2030 Traffic Volumes

The long-term Year 2030 baseline traffic volumes were obtained from the *Original Traffic Study*. The *New One Paseo* project traffic was added to the Year 2030 volumes to obtain the Year 2030 + Project volumes. The Year 2030 without project traffic volumes includes a 150,000 SF DMHTC Expansion project.

TABLE 5–3
APPROVED PROJECT TRIP GENERATION SUMMARY

Land Use	Quantity		Rate [a]		ADT	AM Peak Hour					PM Peak Hour				
						Rate	In:Out	In	Out	Total	Rate	In:Out	In	Out	Total
Corporate Office	237,750	SF	10	/KSF	2,378	15%	9:1	321	36	357	15%	1:9	36	321	357
Multi-Tenant Office	259,590	SF	Ln(T)=0.756Ln (X) + 3.95		3,472	13%	9:1	406	45	451	14%	2:8	97	389	486
Gross Office Trips					**5,850**			**727**	**81**	**808**			**133**	**710**	**843**
Mixed Use Reduction			3%		-175	5%	9:1	-36	-4	-40	4%	1:9	-5	-29	-34
Net Office Trips					*5,674*			*691*	*77*	*768*			*128*	*681*	*809*
Multi-Family Residential	608	DU	6	/DU	3,648	8%	2:8	58	234	292	10%	7:3	256	109	365
Mixed Use Reduction			10%		-365	8%	2:8	-5	-18	-23	10%	7:3	-26	-11	-37
Net Residential Trips					*3,283*			*53*	*216*	*269*			*230*	*98*	*328*
Community Center	198,500	SF	Blended Rate **		13,276	3%	6:4	239	159	398	10%	5:5	664	664	1,328
Cinema	1,200	Seats	1.8	/Seat	2,160	0.30%	3:7	2	4	6	8%	7:3	121	52	173
Gross Retail Trips					**15,436**			**241**	**163**	**404**			**785**	**716**	**1,501**
Commercial Retail Reduction (Commercial Office + Residential)					-540			-41	-23	-64			-31	-39	-70
Net Commercial Trips					*14,896*			*200*	*140*	*340*			*754*	*677*	*1,431*
Total Driveway Trips					**24,934**			**1,026**	**478**	**1,504**			**1,174**	**1,535**	**2,709**
Net Cumulative Trips (Net Trips added to Street System)					**23,853**			**944**	**433**	**1,377**			**1,112**	**1,456**	**2,568**

Source: Approved One Paseo EIR, Appendix C-1.

Footnotes:

* = Source: City of San Diego Trip Generation Manual, May 2003.

** = Blended Rate: 100,650sf @ 40/ksf=4,026 ADT & 30,000sf @ 150/sf = 4,500 ADT & 67,850sf @70/sf=4,750 ADT, so the total is 13,276 ADT.

DU = Dwelling Unit

KSF = 1,000 Square Foot

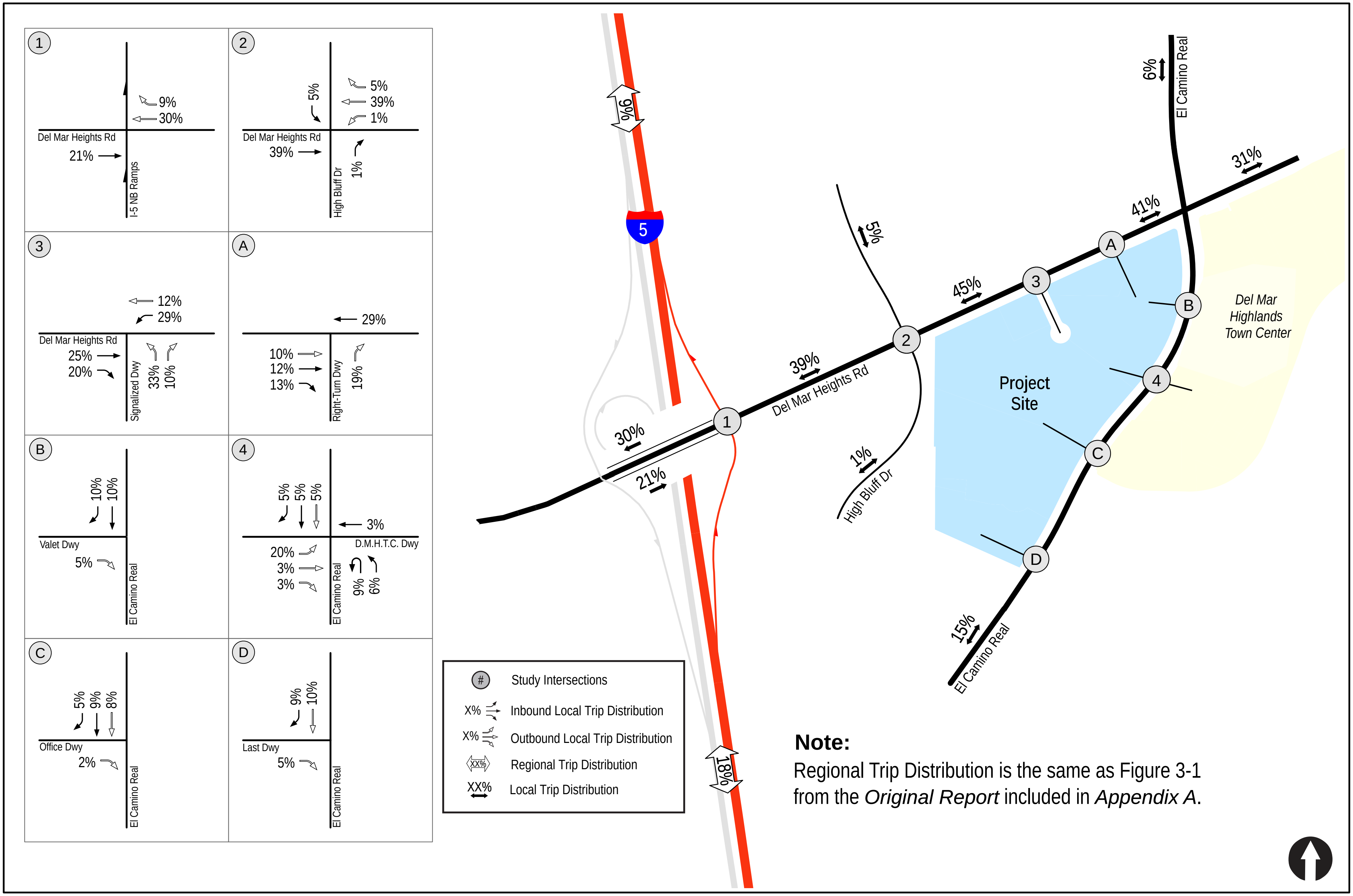

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Figure 5-1

Project Traffic Distribution

ONE PASEO

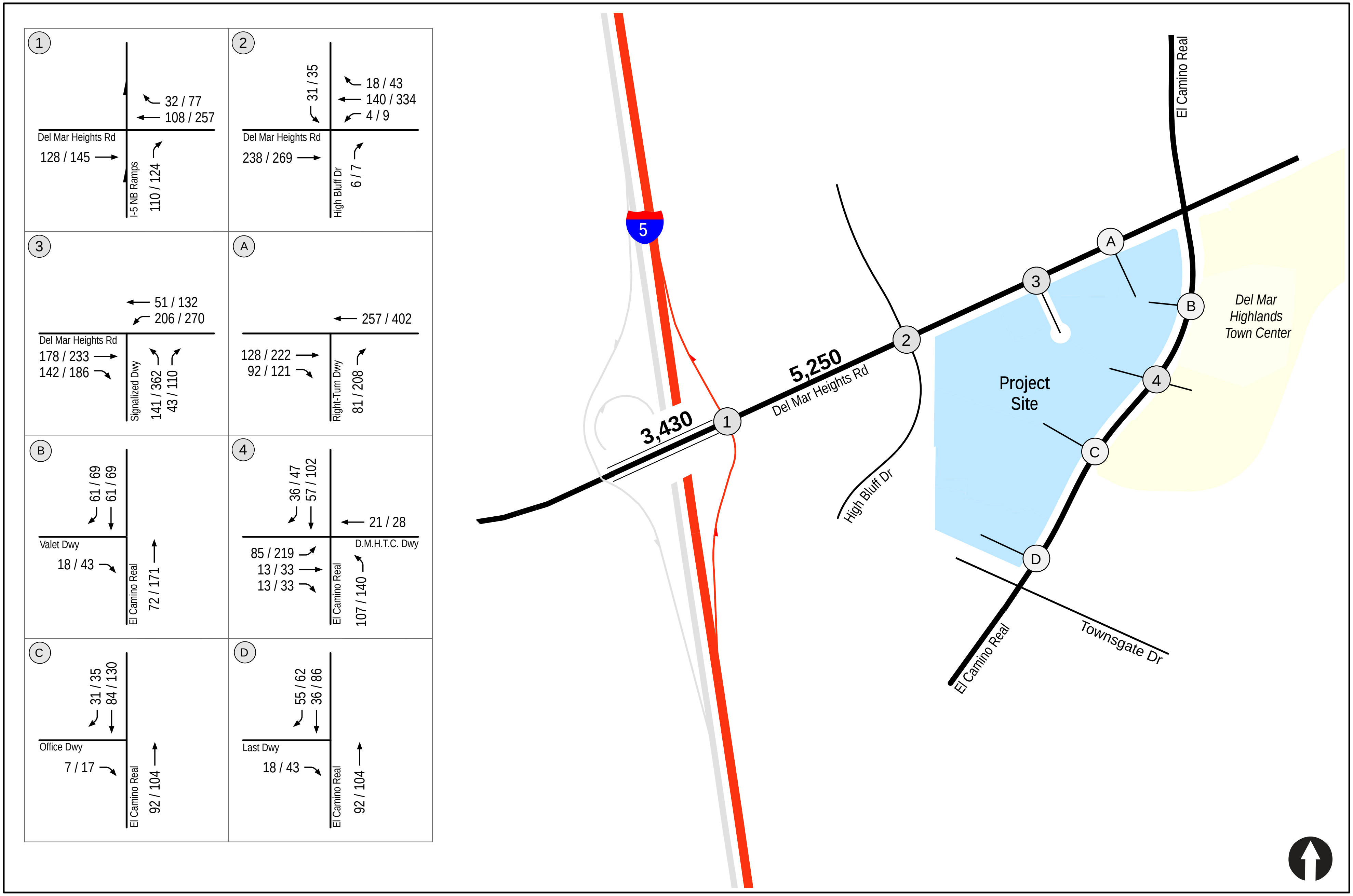

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Figure 5-2

Project Traffic Volumes

ONE PASEO

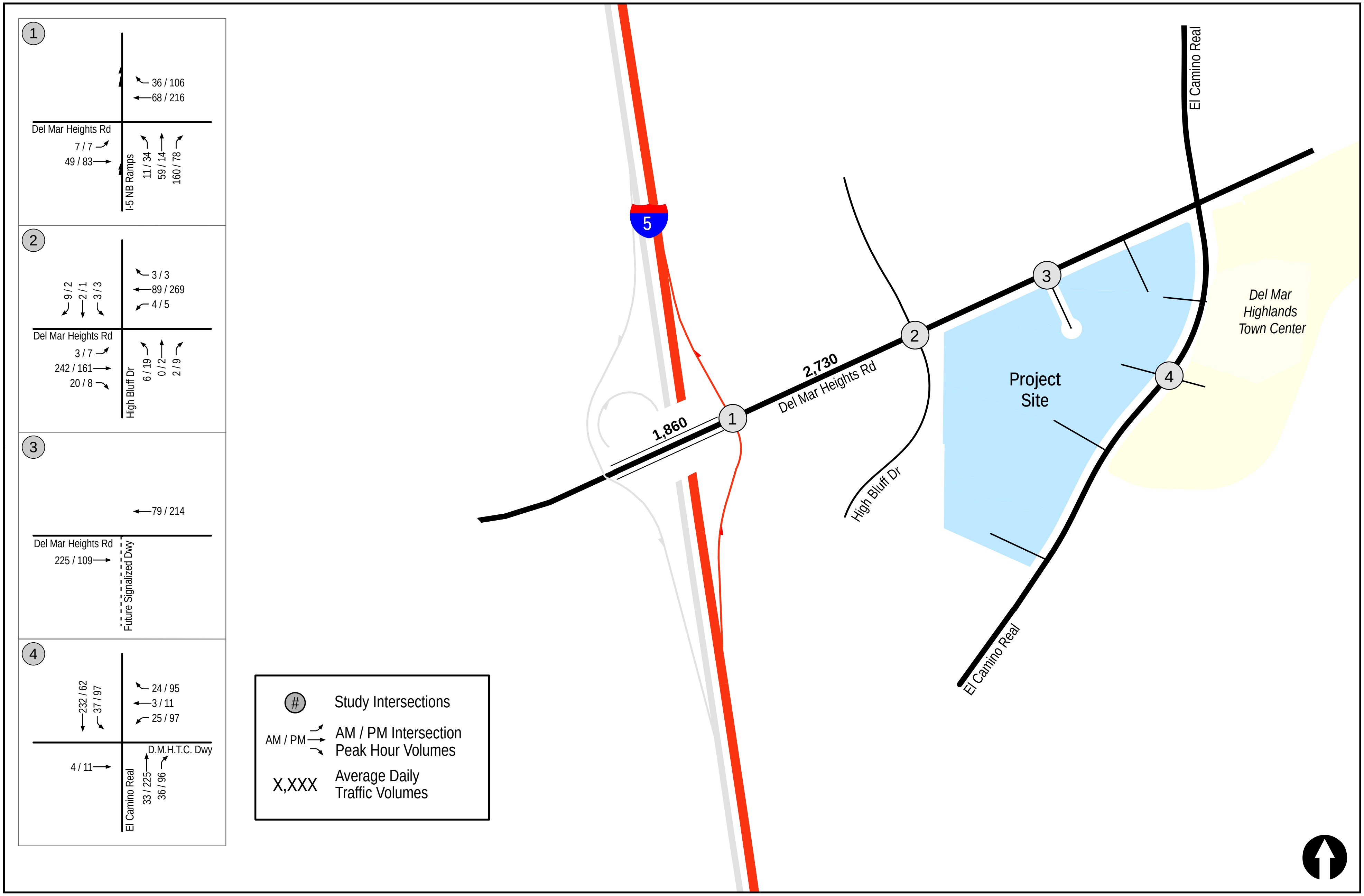

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Figure 5-3

Total Cumulative Projects + 3% Growth Traffic Volumes

ONE PASEO

6.0 ANALYSIS OF NEAR-TERM SCENARIOS

The intersection analysis in the Approved project (Appendix C-1) did not utilize City traffic signal timing plans. Therefore, the delays and LOS are not the same as the New One Paseo Project delays and LOS. The analysis in this study assumes the phases and timings from the City of San Diego signal timing Plans.

6.1 Existing

6.1.1 *Intersection Analysis*

Table 6-1 summarizes the results of the near-term intersection analysis. *Currently*, the High Bluff Drive / Del Mar Heights Road intersection is calculated to operate at LOS E during the PM peak hour. The remaining intersections are calculated to operate at LOS D or better.

Existing peak hour intersection analysis worksheets are included in ***Appendix B.***

6.1.2 *Segment Operations*

Table 6-2 summarizes the results of the near-term segment analysis. *Currently*, all subject segments are calculated to operate at LOS D.

6.2 Existing + Project

Figure 6–1 depicts the Existing + Project Traffic Volumes. The Project traffic volumes (*Figure 5-2*) were added to the Existing traffic volumes, *Figure 3-2*, *Figures 5-1 (Daily) and 5-3 (AM / PM peak hour*) of the *Original Report*, to obtain the Existing + Project traffic volumes shown on this figure.

6.2.1 *Intersection Analysis*

Table 6-1 summarizes the results of the Existing + Project intersection analysis. With the addition of Project traffic, the High Bluff Drive / Del Mar Heights Road intersection is calculated to continue to operate at LOS E during the PM peak hour. The remaining intersections are calculated to operate at LOS D or better.

Existing + Project peak hour intersection analysis worksheets are included in ***Appendix C.***

6.2.2 *Segment Operations*

Table 6-2 summarizes the results of the Existing + Project segment analysis. With the addition of Project traffic, the segment of Del Mar Heights Road between I-5 NB ramps and High Bluff Drive is calculated to operate at LOS E.

TABLE 6–1
EXISTING + PROJECT INTERSECTION OPERATIONS

Intersection	Traffic Control	Peak Hour	Existing		Existing + Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS		
I-5 NB Ramps / Del Mar Heights Rd	Signal	AM	35.7	D	37.8	D	2.1	None
		PM	44.2	D	50.8	D	6.6	None
High Bluff Drive / Del Mar Heights Rd	Signal	AM	28.0	C	29.9	C	1.9	None
		PM	75.5	E	77.0	E	1.5	None [d]
Del Mar Heights Rd / 3rd Ave	Signal	AM	DNE	DNE	16.4	C	NA	NA
		PM	DNE	DNE	27.2	C	NA	NA
El Camino Real / Del Mar Highlands Town Center	Signal	AM	8.2	A	19.4	B	11.2	None
		PM	14.9	B	29.3	C	14.4	None

Footnotes:

a. Average delay per vehicle in seconds
b. Level of service
c. Increase in delay due to project.
d. The Project does not have a direct impact at this intersection since the increase in delay due to the project traffic is less than the allowed threshold of 2.0 seconds.

General Notes:

DNE – Does Not Exist
NA – Not Applicable

TABLE 6–2
EXISTING + PROJECT SEGMENT OPERATIONS

Street Segment	Functional Class [a]	LOS E Capacity [b]	Existing			Existing + Project			Δ V/C [f]	Impact Type
			Vol [c]	LOS [d]	V/C [e]	Vol	LOS	V/C		
Del Mar Heights Road										
I-5 SB Ramps to I-5 NB Ramps	5-Ln Prime Arterial	50,000	40,090	D	0.802	43,520	C	0.870	0.069	None
I-5 NB Ramps to High Bluff Dr	6-Ln Prime Arterial	60,000	51,625	D	0.860	**56,875**	**E**	**0.948**	**0.087**	**Direct**

Footnote:
a. The existing roadway class.
b. Capacity of the existing roadway per *Table 2, City of San Diego Roadway Classifications, Levels of Service (LOS) and Average Daily Traffic (ADT)*
c. Existing Average Daily Traffic (ADT) volumes.
d. Level of Service.
e. Volume / Capacity ratio.
f. Increase in V/C ratio due to project traffic.

6.3 Near-Term Without Project

Figure 6–2 depicts the Near-Term Without Project Traffic Volumes. The *Figure 5-3* Cumulative Projects plus 3% growth factor traffic volumes were added to the Existing traffic volumes (*Figure 3-2*), *Figures 5-1 (Daily) and 5-3 (AM / PM peak hour*) of the *Original Report*, to obtain the Near-Term without project volumes shown on this figure.

6.3.1 *Intersection Analysis*

Table 6-3 summarizes the results of the near-term intersection analysis. With the addition of <u>*Cumulative projects*</u> traffic, the High Bluff Drive / Del Mar Heights Road intersection is calculated to continue to operate at LOS E during the PM peak hour. The remaining intersections are calculated to continue to operate at LOS D or better during either peak hour.

Near-Term without Project peak hour intersection analysis worksheets are included in ***AppendixD.***

6.3.2 *Segment Operations*

Table 6-4 summarizes the results of the near-term segment analysis. With the addition of <u>*Cumulative projects*</u> traffic, both segments are calculated to continue to operate at LOS D.

6.4 Near-Term With Project

Figure 6–3 depicts the Near-Term With Project Traffic Volumes. The *Figure 5-2* Project traffic volumes were added to the Near-Term without Project traffic volumes on *Figure 6-2* to obtain the Near-Term with project volumes shown on this figure.

6.4.1 *Intersection Analysis*

Table 6-3 summarizes the results of the Near-Term with Project intersection analysis. With the addition of Project traffic, the High Bluff Drive / Del Mar Heights Road intersection is calculated to operate at LOS F during the PM peak hour. The remaining intersections are calculated to operate at LOS D or better during either peak hour.

A direct near-term impact was determined at the I-5 NB ramps / Del Mar Heights Road in the *Original* and *Approved* projects. However, with the *New One Paseo* Project traffic, no direct impact was calculated.

Near-Term with Project peak hour intersection analysis worksheets are included in ***Appendix E.***

6.4.2 *Segment Operations*

Table 6-4 summarizes the results of the near-term with Project segment analysis. With the addition of Project traffic, both segments are calculated to operate at LOS E.

The segment analysis of Near-Term With Project (No Office) in *Table 6-4* shows that with construction of only the retail and residential land uses, no impact would occur on Del Mar Heights Road between I-5 SB Ramps and I-5 NB Ramps.

TABLE 6–3
NEAR-TERM INTERSECTION OPERATIONS

Intersection	Traffic Control	Peak Hour	Existing		Near-Term Without Project		Near-Term With Project		Δ Delay [c]	Impact Type
			Delay [a]	LOS [b]	Delay	LOS	Delay	LOS		
I-5 NB Ramps / Del Mar Heights Rd	Signal	AM	35.7	D	40.2	D	46.3	D	6.1	None
		PM	44.2	D	47.2	D	48.3	D	1.1	None
High Bluff Drive / Del Mar Heights Rd	Signal	AM	28.0	C	30.8	D	37.9	D	7.1	None
		PM	75.5	E	**81.3**	**E**	**103.3**	**F**	**22.0**	**Direct**
Del Mar Heights Rd / 3rd Ave	Signal	AM	DNE	DNE	DNE	DNE	18.3	B	NA	NA
		PM	DNE	DNE	DNE	DNE	18.3	B	NA	NA
El Camino Real / Del Mar Highlands Town Center	Signal	AM	8.2	A	10.1	B	20.8	C	10.7	None
		PM	14.9	B	21.0	C	39.5	D	18.5	None

Footnotes:
a. Average delay per vehicle in seconds
b. Level of service
a. Increase in delay due to project.

General Notes:
DNE – Does Not Exist
NA – Not Applicable

Table 6–4
Near-Term Segment Operations

Street Segment	Functional Class [a]	LOS E Cap [b]	Near-Term Without Project			Near-Term With Project (No Office) [f]			Δ V/C [g]	Impact Type	Near-Term With Entire Project			Δ V/C [g]	Impact Type
			Vol	LOS	V/C	Vol	LOS	V/C			Vol	LOS	V/C		
Del Mar Heights Road															
I-5 SB Ramps to I-5 NB Ramps	5-Ln Prime Art	50,000	41,950	D	0.839	44,480	D	0.890	0.051	None	**45,380**	**E**	**0.908**	**0.069**	**Direct**
I-5 NB Ramps to High Bluff Dr	6-Ln Prime Art	60,000	54,355	D	0.906	**59,605**	**E**	**0.993**	**0.087**	**Direct**	**59,605**	**E**	**0.993**	**0.087**	**Direct**

Footnote:

a. The existing roadway class.
b. Capacity of the existing roadway per *Table 2, City of San Diego Roadway Classifications, Levels of Service (LOS) and Average Daily Traffic (ADT)*
c. Existing Average Daily Traffic (ADT) volumes.
d. Level of Service.
e. Volume / Capacity ratio.
f. With construction of only the retail and residential land uses, no impact would occur on Del Mar Heights Road between I-5 SB Ramps and I-5 NB Ramps.
g. Increase in V/C ratio due to project traffic.

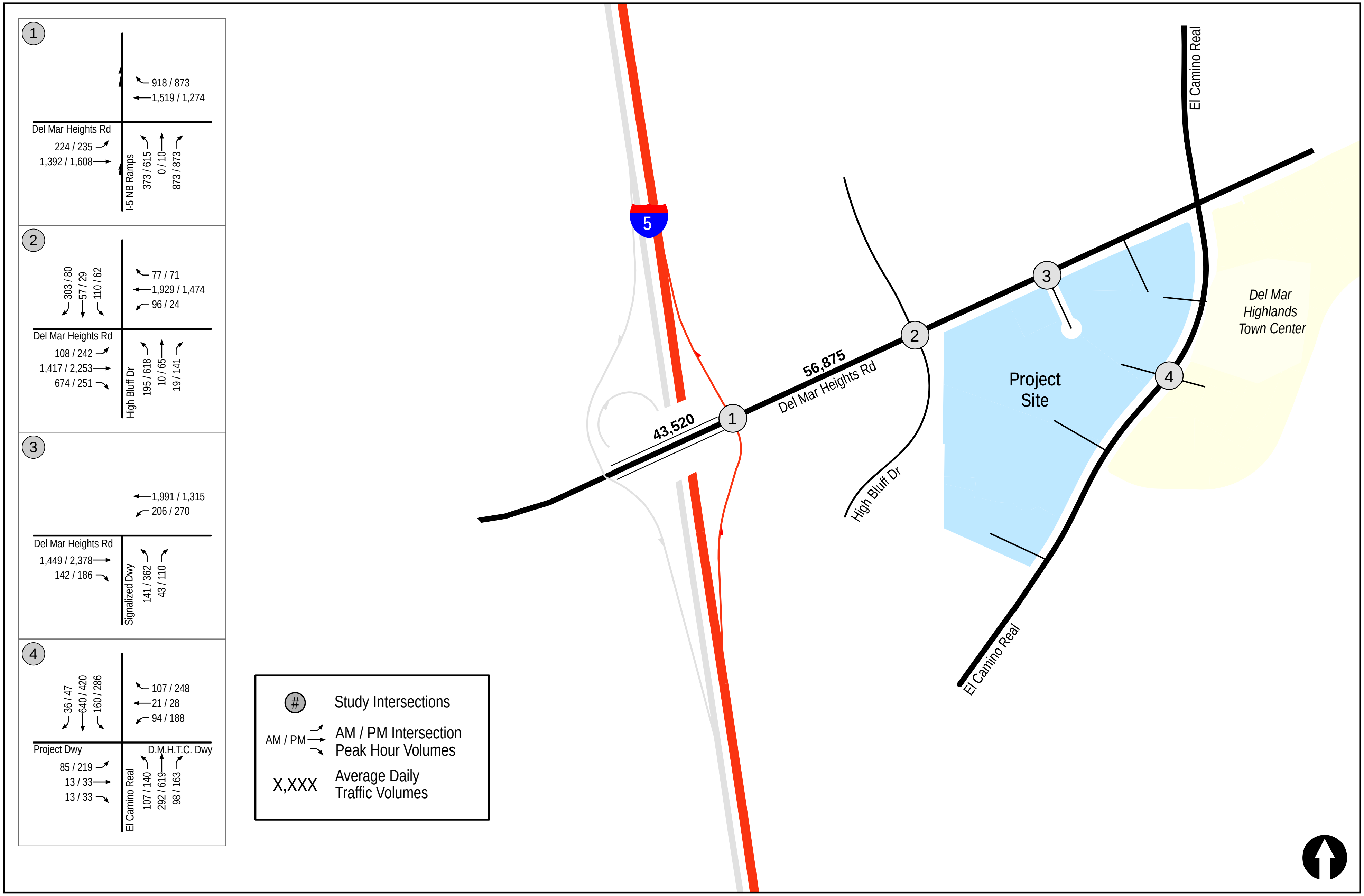

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Figure 6-1

Existing + Project Traffic Volumes

One Paseo

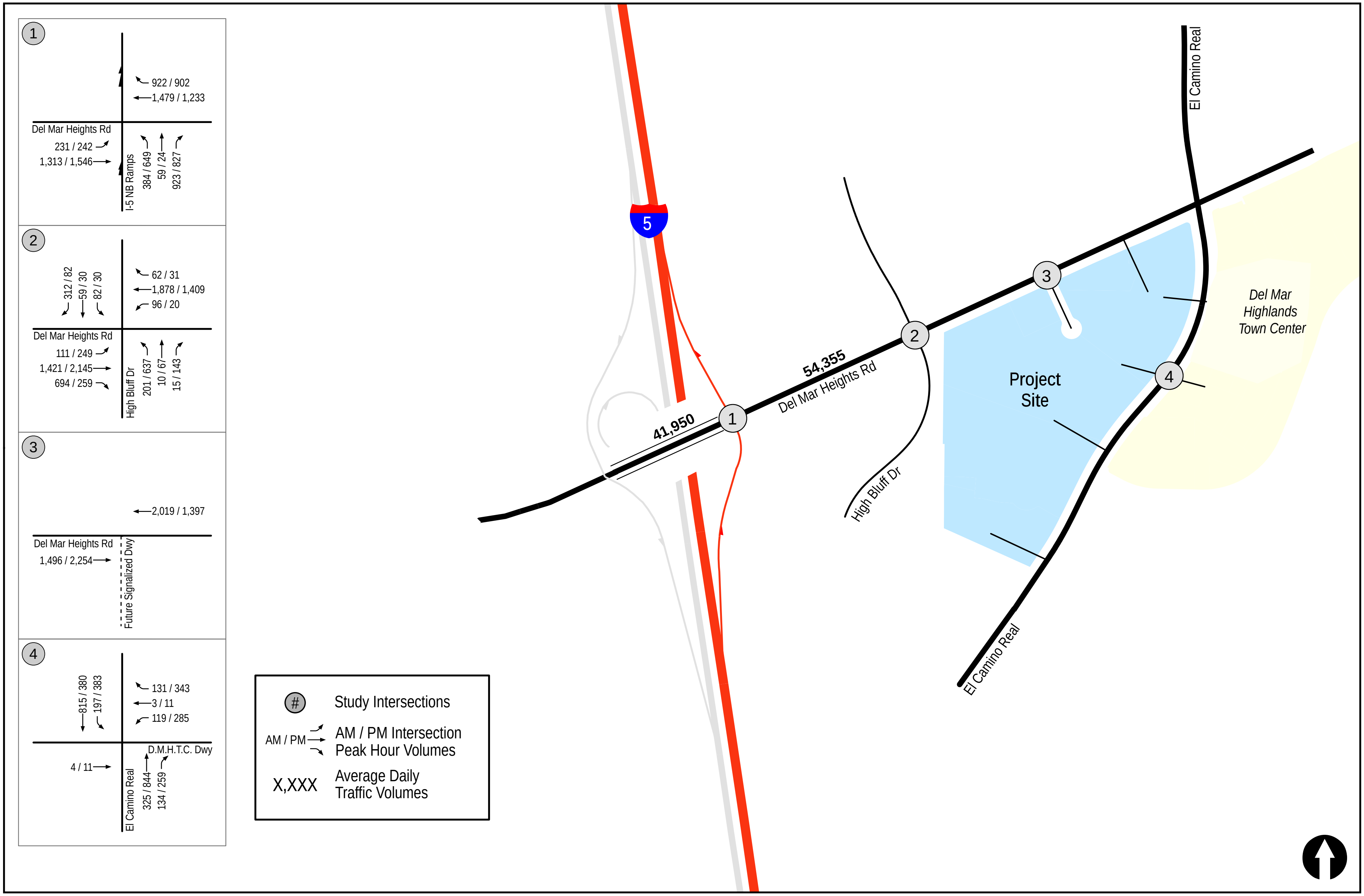

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Figure 6-2

Near-Term Without Project Traffic Volumes

ONE PASEO

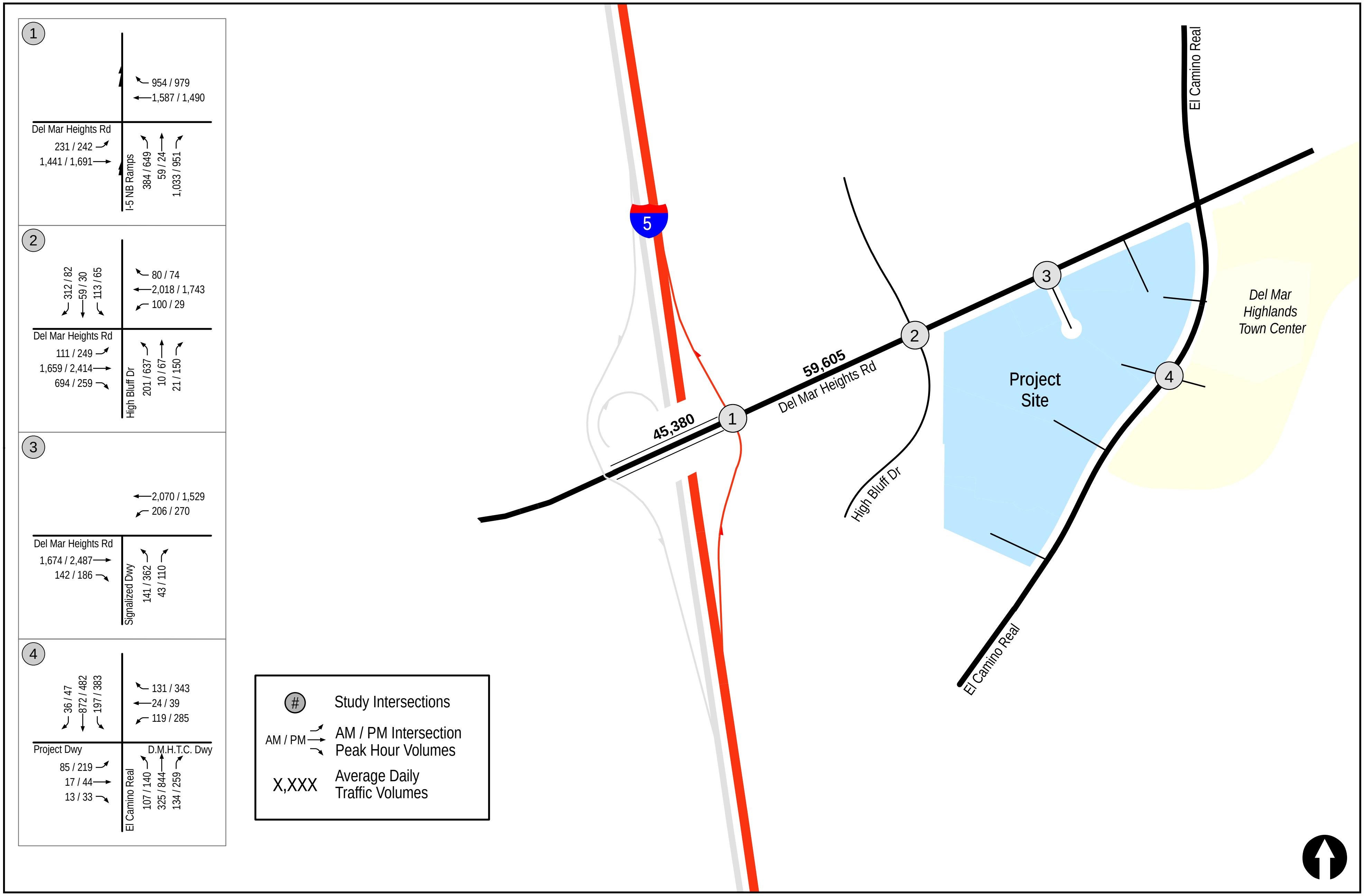

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Figure 6-3

Near-Term With Project Traffic Volumes

ONE PASEO

7.0 ANALYSIS OF LONG-TERM SCENARIOS

Following is a description of the Long-Term intersection and segment analyses.

7.1 Year 2030 Without Project

Figure 7–1 depicts the Year 2030 Without Project Traffic Volumes. The Year 2030 without project traffic volumes were obtained from *Figures 12-1 (Daily) and 12-2 (AM / PM peak hour)* of the *Original Project* Report (included in *Appendix A*).

7.1.1 *Intersection Analysis*

Table 7–1 summarizes the results of the Long-Term intersection analysis.

Without Project, in the Year 2030, the following intersections are calculated to operate at LOS E or worse:

- I-5 NB Ramps / Del Mar Heights Road (LOS E during the AM and PM peak hours)
- High Bluff Drive / Del Mar Heights Road (LOS E during the PM peak hour)

Long-Term without Project peak hour intersection analysis worksheets are included in ***Appendix F.***

7.1.2 *Segment Operations*

Table 7–2 summarizes the results of the Long-Term segment analysis. In the Year 2030 *Without* Project, the two segments are calculated to operate at LOS D or better.

7.2 Year 2030 + Project

Figure 7–2 depicts the Year 2030 With Project Traffic Volumes. The Project traffic volumes (*Figure 5-2*) were added to the Year 2030 without Project traffic volumes (*Figure 7-1*), to obtain the Year 2030 with Project traffic volumes, shown on this figure.

7.2.1 *Intersection Analysis*

Table 7–1 summarizes the results of the Long-Term intersection analysis. With the addition of *Project traffic*, the following intersections are calculated to operate at LOS E or worse:

- I-5 NB Ramps / Del Mar Heights Road (LOS F during the AM peak hour and LOS E during the PM peak hour)
- High Bluff Drive / Del Mar Heights Road (LOS F during the PM peak hour)

Long-Term with Project peak hour intersection analysis worksheets are included in ***Appendix G.***

7.2.2 *Segment Operations*

Table 7–2 summarizes the results of the Long-Term segment analysis. *With* the addition of Project traffic, the segment of Del Mar Heights Road between I-5 NB Ramps and High Bluff Road is calculated to operate at LOS E.

Table 7–1
Long-Term Intersection Operations

Intersection	Traffic Control	Peak Hour	Year 2030 Without Project [a]		Year 2030 With Project		Δ Delay [d]	Impact Type
			Delay [b]	LOS [c]	Delay	LOS		
I-5 NB Ramps / Del Mar Heights Rd	Signal	AM	**61.5**	**E**	**80.9**	**F**	**19.4**	**Cumulative**
		PM	**55.8**	**E**	**71.0**	**E**	**15.2**	**Cumulative**
High Bluff Drive / Del Mar Heights Rd	Signal	AM	43.2	D	44.9	D	1.7	None
		PM	**57.6**	**E**	**80.1**	**F**	**22.5**	**Cumulative**
Del Mar Heights Rd / Signalized Project Driveway	Signal	AM	DNE	DNE	10.8	B	NA	NA
		PM	DNE	DNE	29.4	C	NA	NA
El Camino Real / Del Mar Highlands Town Center	Signal	AM	9.4	A	20.7	C	11.3	None
		PM	18.1	B	34.5	C	16.4	None

Footnotes:

a. From Attachment 22 to EIR Appendix C-4, May 21, 2014 (*Approved Project* with updated signal timing and 150,000 of expansion at DMHTC).
b. Average delay per vehicle in seconds
c. Level of service
d. Increase in traffic in the critical movement due to project at unsignalized intersections

General Notes:

DNE – Does Not Exist
NA – Not Applicable

TABLE 7-2
LONG-TERM SEGMENT OPERATIONS

Street Segment	Functional Class [a]	LOS E Capacity [b]	Year 2030 Without Project			Year 2030 With Project			Δ V/C [f]	Impact Type
			Vol [c]	LOS [d]	V/C [e]	Vol	LOS	V/C		
Del Mar Heights Road										
I-5 SB Ramps to I-5 NB Ramps	5-Ln Prime Art	50,000	37,820	C	0.756	41,250	D	0.825	0.069	None
I-5 NB Ramps to High Bluff Dr	6-Ln Prime Art	60,000	51,800	D	0.863	**57,050**	**E**	**0.951**	**0.088**	**Cumulative**

Footnote:

a. The existing roadway class.
b. Capacity of the existing roadway per *Table 2, City of San Diego Roadway Classifications, Levels of Service (LOS) and Average Daily Traffic (ADT)*
c. Existing Average Daily Traffic (ADT) volumes.
d. Level of Service.
e. Volume / Capacity ratio.
f. Increase in V/C ratio due to project traffic.

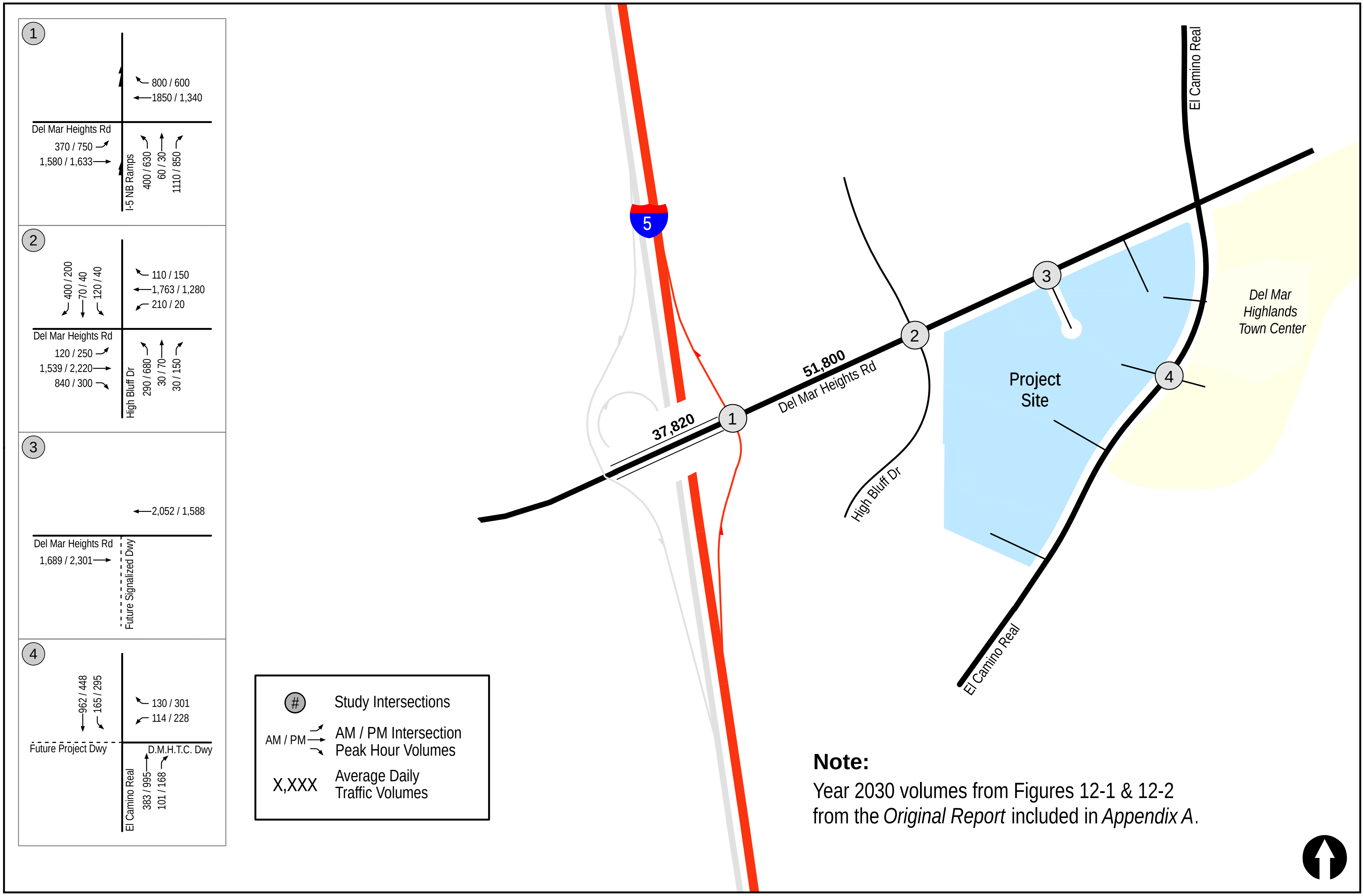

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Figure 7-1

Year 2030 Without Project Traffic Volumes

ONE PASEO

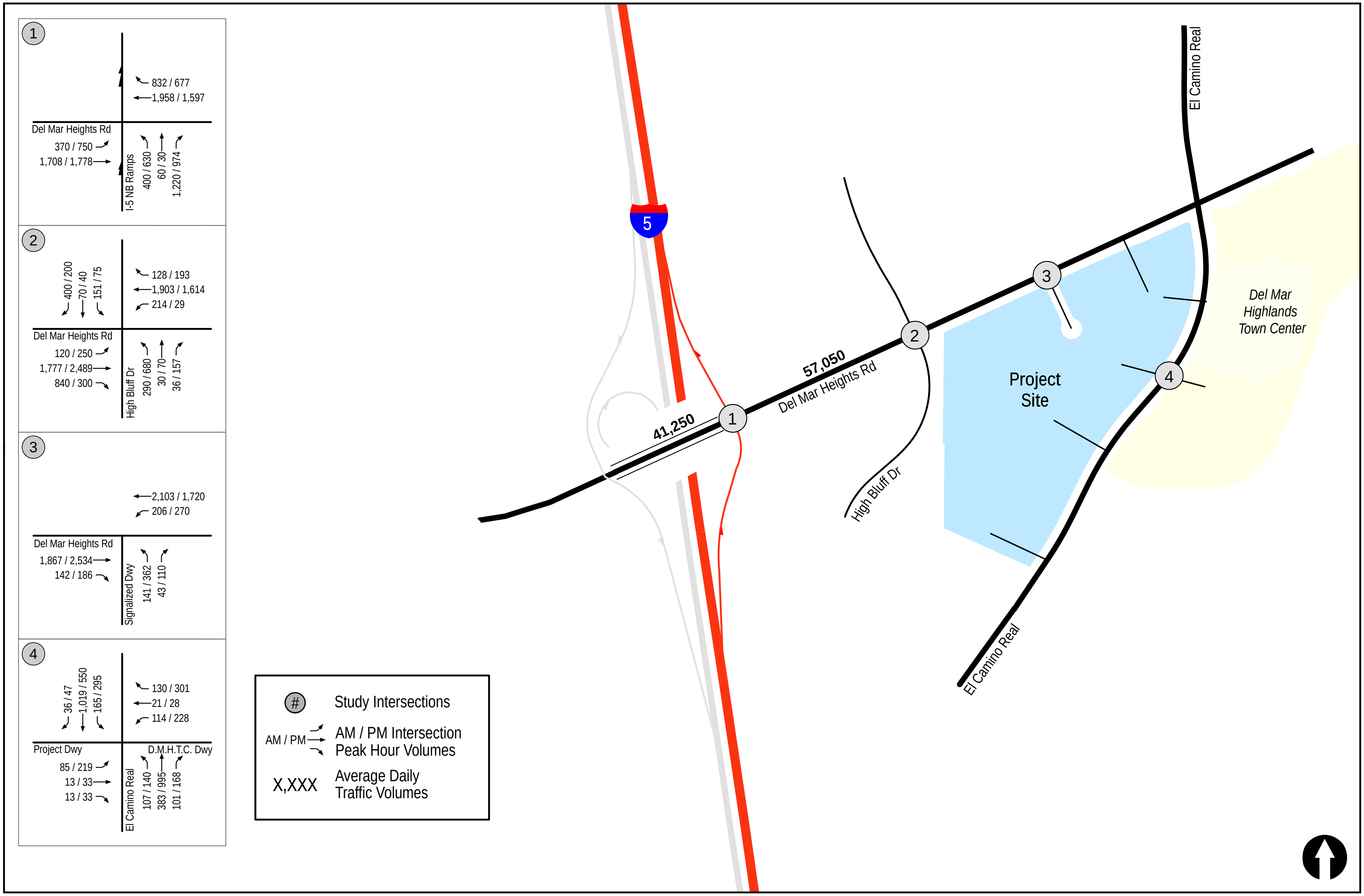

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Figure 7-2

Year 2030 With Project Traffic Volumes

ONE PASEO

8.0 QUEUING ANALYSIS

A 95th percentile queuing analysis was conducted for the following two intersections on Del Mar Heights Road:

1. **Del Mar Heights Road /I-5 NB Ramps**

   This is to determine the storage length required for the WB right-turn lane(s) on Del Mar Heights Road.

2. **Del Mar Heights Road / El Camino Real intersection.**

   This is to determine the storage length required for the EB right-turn lane on Del Mar Heights Road.

Table 8-1 summarizes the calculated queue lengths at the above two intersections.

1. **Del Mar Heights Road /I-5 NB Ramps**

   Two alternatives were analyzed for the westbound right turn. The first was an extended single lane and the second was dual westbound right-turn lanes.

   Alternate 1 - As seen in *Table 8-1*, the forecast queue in the right-turn lane is approximately 120 feet and in the westbound through lane is 810 feet.

   Alternate 2 - As seen in *Table 8-1*, the forecast queue in the right-turn lanes is approximately 20 feet and the queue in the westbound through lane is 810 feet.

   The analysis shows that the queue within the WB through lane is forecasted to exceed the length of the dual right-turn lanes at times, making it difficult to access the WB right-turn lanes.

2. **Del Mar Heights Road / El Camino Real intersection.**

   As seen in *Table 8-1*, the available distance to the project right-in / right-out driveway is 320 feet. The forecast higher queue of the two peak hours in the right-turn lane is approximately 105 feet. The available distance to the project right-in / right-out driveway is longer than the forecast queue plus the necessary transition length.

Figure 8-1 depicts the conceptual plan of the proposed right-turn lane on EB Del Mar Heights Road at El Camino Real.

The queuing analysis worksheets are included in ***Appendix H***.

TABLE 8-1
YEAR 2030 CALCULATED LONGEST QUEUE

Peak Hour	Del Mar Heights Road / I-5 NB Ramps					Del Mar Heights Road / El Camino Real	
	Option A Queue (Single Right Turn Lane)		Option B Queue (Dual Right Turn Lanes)		Distance [b] to Upstream Intersection	EBR Queue	Distance to Upstream Intersection
	WBR [a]	WBT	WBR	WBT			
AM	120	810	20	810	1,030	105	320
PM	230	630	70	630	1,030	75	320

Footnotes:

a. Queue in feet

b. Distance in feet

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Figure 8-1

Conceptual Plan of EB Right-Turn Lane at El Camino Real

9.0 MITIGATION MEASURES

This traffic addendum report concludes that with the *New One Paseo* Project, significant impacts would occur at each of the locations previously identified to be significantly impacted in the EIR by the *Approved* Project. In other words, intersections/segments that were determined to be significantly impacted by the *Approved* Project are also impacted under the *New One Paseo* Project. The following two locations were specifically analyzed to determine if the mitigation recommended in the approved EIR could be reduced, given the reduction in project trip generation:

- Del Mar Heights Road / I-5 NB ramps intersection
- Del Mar Heights Road / High Bluff Drive intersection

The mitigation analysis worksheets are included in ***Appendix I***.

1. Del Mar Heights Road / I-5 NB Ramps

The approved EIR mitigation is as follows:

- Modify I-5 northbound off ramp: widen and restripe off-ramp to include dual left, a shared through/right and an exclusive right turn lane.
- Reconfigure median on bridge to extend EB dual left-turn pocket to 400 feet.
- Extend westbound right-turn pocket by 845 feet

An alternative mitigation for the westbound approach (third bullet above) that would provide double right-turn lanes extending to the AT&T building, as opposed to the 845 feet extension of the existing right-turn lane was also examined. A review of the queuing in the westbound direction revealed that though the queue in the right-turn lane would be approximately 120 feet, the peak hour queue in the westbound through lane is 810 feet, longer than the length of the dual right-turn lanes. The intersection delays are slightly lower for the dual right-turn lane option. The analysis shows that the queue within the WB through lane will exceed the length of the dual right-turn lanes at times, making it difficult to access the right-turn lanes. Either the single lane or dual lane options are considered acceptable but only if one of the dual lanes is extended to the eastside of the AT&T buildings.

Appendix J contains the figures depicting several conceptual options for improving the westbound right-turn movement at the Del Mar Heights Road / I-5 NB Ramps intersection.

2. Del Mar Heights Road / High Bluff Drive

Table 9−2 shows the approved EIR mitigation and three alternative mitigation options as outlined below.

The approved EIR mitigation is as follows:

- Widen to provide dedicated NB right-turn lane at Phase 1 and widen Del Mar Heights Road on north side receiving lanes and restripe NB left and rephase signal to provide triple left.

- Modify EB and WB left-turn lanes to dual left-turn lanes.
- Widen EB approach by 2 feet on the south side to accommodate the EB and WB dual lefts

As seen in *Table 9-2*, the following mitigation options were evaluated:

Mitigation Option 1

Same as approved mitigation but no second EB and WB left-turn lanes.

Mitigation Option 2

Same as approved mitigation but no second EB left-turn lane and no third NB left-turn lane.

Mitigation Option 3

Same as approved mitigation but no second EB / WB left-turn lanes and no NB right-turn lane.

Mitigation Option 4

Same as approved mitigation but no second EB / WB left-turn lanes and no third NB left-turn lane.

Figure 9-1 depicts the mitigation options at the Del Mar Heights Road / High Bluff Drive intersection.

Table 9−1 shows that both Options 1 & 3 would both fully mitigate the project impacts but Options 2 and 4 would not, both in the near-term and long-term.

All options would not require the provision of a second through lane on NB High Bluff Drive north of Del Mar Heights Road since that lane would only be needed if a second EB left-turn lane is provided on EB Del Mar Heights Road.

It is recommended that the chosen mitigation include the extension of the existing 175-foot storage in the eastbound left-turn lane by approximately 90 feet. The existing westbound left-turn lane storage into the Shell gas station would remain unchanged. This will provide additional storage for the eastbound left-turn lane onto High Bluff Drive and maintain adequate storage for vehicles within the westbound left-turn lane to Shell.

Appendix J contains aerial photos depicting the existing and proposed condition with the lengthened left-turn pocket.

TABLE 9–1
I-5 NB RAMPS / DEL MAR HEIGHTS ROAD
MITIGATED INTERSECTION OPERATIONS

Intersection	Mitigation	Peak Hour	Near-Term [a]				Long-Term (Year 2030) [e]			
			Without Project		With Project		Without Project		With Project	
			Delay [b]	LOS [c]	Delay	LOS	Delay	LOS	Delay	LOS
Without Mitigation		AM	40.2	D	46.3	D	**61.5**	**E**	**80.9**	**F**
		PM	47.2	D	48.3	D	**55.8**	**E**	**71.0**	**E**
With Approved Mitigation [d]	Single WB Right-turn lane (approved mitigation)	AM	-	-	-	-	-	-	**72.0**	**E**
		PM	-	-	-	-	-	-	**64.2**	**E**
Mitigation Option	Dual WB Right-turn lanes of equal length	AM	-	-	-	-	-	-	**70.3**	**E**
		PM	-	-	-	-	-	-	**62.0**	**E**

Footnotes:

a. The project does not have a significant direct impact at the I-5 NB Ramps / Del Mar Heights Road intersection in the near-term and hence the mitigated analysis is not included.
b. Average delay per vehicle in seconds
c. Level of service
d. Approved Mitigation - Modify I-5 NB On/Off Ramps: Widen & restripe off-ramp to include dual left, a shared through/right and right turn lanes. Extend WB right turn pocket by 845 feet; Reconfigure median on bridge to extend EB dual left turn pocket to 400 feet.
e. Project impact is not fully mitigated in the horizon year 2030 (same as in the *Original* and *Approved* reports).

TABLE 9–2
HIGH BLUFF DRIVE / DEL MAR HEIGHTS ROAD
MITIGATED INTERSECTION OPERATIONS

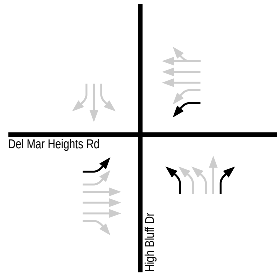
Description	Mitigation	Peak Hour	Near-Term				Long-Term (Year 2030)			
			Without Project		With Project		Without Project		With Project	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Without Mitigation		AM	30.8	D	37.9	D	43.2	D	44.9	D
		PM	**81.3**	**F**	**103.3**	**F**	57.6	E	**80.1**	**F**
With Approved Mitigation [e]			-	-	33.7	C	-	-	33.7	D
			-	-	51.4	D	-	-	50.8	D
With Mitigation Option 1	Same as Approved Mitigation, but **no** second EBL and WBL turn lanes	AM	-	-	34.7	D	-	-	34.0	C
		PM	-	-	53.5	D	-	-	54.3	D
With Mitigation Option 2	Same as Approved Mitigation, but **no** second EBL turn lane and **no** third NBL turn lane	AM	-	-	38.1	D	-	-	37.0	D
		PM	-	-	78.0	E	-	-	**79.0**	**E**
With Mitigation Option 3	Same as Approved Mitigation, but **no** second EB and WB Left-turn lanes and **no** NBR turn lane	AM	-	-	32.1	C	-	-	33.9	C
		PM	-	-	54.8	D	-	-	54.6	D
With Mitigation Option 4	Same as Approved Mitigation, but **no** second EB and WB Left-turn lanes and **no** third NB Left-turn lane	AM	-	-	39.2	D	-	-	39.9	D
		PM	-	-	79.3	E	-	-	**79.5**	**E**

Footnotes:

a. Average delay per vehicle in seconds
b. Level of service
c. Approved Mitigation: Widen to provide dedicated NB right turn lane & widen Del Mar Heights Road on north side receiving lanes and restripe NB left and rephase signal to provide triple left. Modify EB & WB left turn lanes to dual left turn lanes. Widen EB approach by 2 feet on the south side to accommodate the EB & WB dual lefts.

Note:
BOLD indicates impact not mitigated.

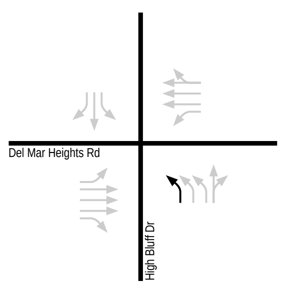
Approved Mitigation



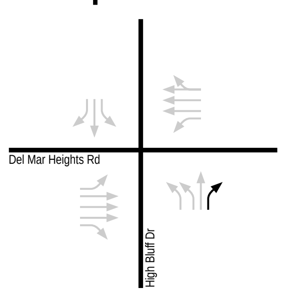
Option 1

Option 2

Option 3



Option 4



Mitigation shown in BOLD.

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Figure 9-1

Mitigation Options

ONE PASEO

10.0 CONSTRUCTION TRAFFIC ANALYSIS

A detailed construction analysis was completed for the *Originally Proposed Project*. Intersections and segments along Del Mar Heights Road and El Camino Real were analyzed. One significant impact was calculated (Del Mar Heights Road between I-5 and High Bluff Drive) with the additional construction traffic.

Table 10-1 summarizes the phased construction activities from the *Original* Traffic Study. As seen in this table, the amount of import / export material for Phase I of the *Original* Project was 243,670 cubic yards (CY) and this amount was analyzed in the *Original* Traffic Study. The equivalent value for the entire New One Paseo project is 195,200 CY, representing a reduction of approximately 20%. The duration of grading is forecasted to be 100 days.

TABLE 10-1
CONSTRUCTION ACTIVITIES

Original Project	**Import / Export**	**Grading Duration**
Phase I	243,670 CY	110 Days
Phase II	118,800 CY	60 Days
Phase III	141,500 CY	55 Days
Total	**503,970 CY**	
New One Paseo Project	195,200 CY	100 Days

Table 10-2 summarizes the construction traffic trip generation for the *New One Paseo* project. As seen in Table 10-2, the daily trip generation would be 1,735 trips which is 40 trips less than the forecasted maximum construction trips in Appendix O of the *Original* Traffic Impact Study (see ***Appendix K***). In the Original Report, one significant impact resulted since the ADT on Del Mar Heights Road with the construction traffic was 55,001, one trip over the significance threshold. Since the amount of construction trips will be less with the *New One Paseo Project,* no significant construction impact would therefore result.

TABLE 10-2
NEW ONE PASEO CONSTRUCTION TRAFFIC TRIP GENERATION

Purpose	Number		PCE [a] Factor	Equivalent [b] Autos		# of Trips per day		ADT	AM Peak Hour					PM Peak Hour				
									Rate [c]	In:Out	In	Out	Total	Rate [c]	In:Out	In	Out	Total
Employees	300	Autos	1.0	300	Autos	2	/Auto	600	4%	9:1	22	2	24	4%	2:8	5	19	24
Material Deliveries	22	Trucks	2.5	55	Trucks	2	/Truck	110	9%	4:6	4	6	10	8%	5:5	5	4	9
Trucks	205	Trucks	2.5	513	Trucks	2	/Truck	1,025	9%	4:6	37	55	92	8%	5:5	41	41	82
Total								**1,735**			**63**	**63**	**126**			**51**	**64**	**115**

Footnotes:

a. PCE - Passenger Car Equivalents for trucks is 2.5 per Exhibit 21-9 in the Highway Capacity Manual 2000.

b. Number of trucks X PCE factor is the number of equivalent autos.

c. Typical work hours 7 AM to 3:30 PM. For Employee Peak Hour In/Out Ratios, at 4% AM and PM peak is assumed based on the AM peak counts beginning at 7:30AM and the majority of employee shifts ending at 3:30PM, Which is prior to the PM peak counts beginning at 5:00 PM.

d. Material Deliveries end Truck Imports/Exports, the Truck Terminal land use peak hour splits are based on 'the City of San Diego Trip Generation Manual, May 2003.

11.0 FAIR SHARE CALCULATIONS

Fair share calculations were updated to determine the New One Paseo Project's percentage contribution towards significant cumulative impacts. ***Table 11−1*** summarizes the calculations and the fair share percentages for each significant cumulative impact. The fair share percentages from the *Originally Proposed Project* are also shown in *Table 11−1*, for comparison purposes and are included in ***Appendix L***.

TABLE 11−1
FAIR SHARE CALCULATIONS

Segment	**ADT / Entering Volumes**			***New One Paseo* Project Percentage**	***Originally Proposed Project* Percentage [a]**
	Existing	**Year 2030 With Project**	**Project**		
A	**B**	**C**	**D**	**E=D/(C-B) [a]**	
El Camino Real					
Via De la Valle to San Dieguito	15,579	31,724	404	2.5%	4.9%
Via De La Valle					
San Andreas to El Camino Real	24,400	33,369	269	3.0%	5.8%
City of San Diego Calculation:					
269* $5692.61 per ADT = $1,531,312					
Fair Share percentage				**9.7%**	19.4%
$1,531,312 / $15,800,000					
Del Mar Heights Road / I-5 SB Loop On Ramp					
AM	406	651	36	14.7%	
PM	242	490	90	36.4%	
Weighted Average				**25.5%**	34.8%
El Camino Real / SR 56 on Ramp					
AM	3,075	4,538	38	2.6%	
PM	3,493	5,759	62	2.7%	
Weighted Average				**2.7%**	3.5%
Del Mar Heights / I-5 NB On Ramp					
AM	4,921	6,548	378	23.2%	
PM	4,885	6,436	603	38.9%	
Average				**31.1%**	100.0% [c]

Footnotes:

a. Source – Approved One Paseo Project Traffic Study

b. Fair Share Formula = Project Traffic / ((2030 + Project Traffic) – Existing Traffic)

c. The owner / permittee voluntarily agreed to a 100% mitigation even though the impact at this location was a long-term cumulative impact.

12.0 CONCLUSIONS

This traffic study addendum concludes that the same locations that were significantly impacted by the *Originally Proposed Project* and by the *Approved* Project in the EIR are also significantly impacted with the *New One Paseo* Project, notwithstanding the reduction in Project traffic. Under no circumstances were new significant impacts identified, nor did previously identified significant impacts worsen as a result of the *New One Paseo* Project.

12.1 Impacts and Mitigation Measures

The Project impact at the Del Mar Heights Road / I-5 NB Ramps intersection would be cumulative since a near-term impact is not calculated. There are two locations where alternative mitigation could be implemented, the Del Mar Heights Road / I-5 northbound ramps intersection and the Del Mar Heights / High Bluff Drive intersection.

Two mitigation options were evaluated for the WB right-turn movement at the I-5 NB Ramps / Del Mar Heights Road intersection. The single lane option is better from a queue perspective since the WB through queue would at times extend past the length of the dual right-turn lanes. The dual right-turn lane option results in slightly lower overall intersection delay at the Del Mar Heights Road / I-5 NB Ramps intersection.

At the Del Mar Heights Road / High Bluff Drive intersection, the reduced One Paseo project would allow a revised mitigation package to:

a. Eliminate the second eastbound and westbound left-turn lanes (Mitigation Option 1), or
b. Eliminate the second eastbound and westbound left-turn lanes and the northbound right-turn lane (Mitigation Option 3).

Both of these mitigation options (1 & 3) would fully mitigate the impacts of the *New One Paseo* Project, as shown in *Table 9-2*. Since EB / WB dual lefts are no longer needed at the Del Mar Heights Road / High Bluff Drive intersection, no widening of Del Mar Heights Road at this location is required.

The mitigation recommended at all other locations would remain unchanged other than the calculated fair share percentages. The analysis also shows that one traffic signal on Del Mar Heights Road along with a proposed right-in / right-out driveway would be sufficient to accommodate project traffic, as opposed to the two signals evaluated for the *Originally Proposed Project* and the *Approved Project* in the EIR.

The *New One Paseo* Project would generate 10,385 less ADT as compared to the *Approved* Project. Since the *New One Paseo* Project would generate less traffic on both a daily and directional peak hour basis, the results and conclusions of the *Approved* EIR traffic study remain applicable to the *New One Paseo* Project and the mitigation measures identified in the *Approved* traffic study would be equally effective in mitigating impacts due to the *New One Paseo* Project. Consequently, with regard to traffic impacts, there are no Project changes that would necessitate a subsequent EIR pursuant to CEQA Guidelines section 15162.

12.2 Timing of Implementation of Mitigation Measures

As a consequence of the reduced size of the *New One Paseo* Project, and the elimination of the distinct development phases, the timing of mitigation may differ from that in the *Approved* Project. However, all mitigation will be implemented prior to the impact at issue.

Specifically, since the impacts to the NB On-Ramp and SB loop On-Ramp ramp meters are cumulative and not direct impacts (as they were with the *Original* and *Approved* projects), the mitigation is now not needed until prior to occupancy of the first office building. Also, since the impact to the Del Mar Heights Road segment between the I-5 NB and SB ramps does not occur with only the project's retail and residential components (*Table 6-4*), the mitigation of extending the dual EB to NB left-turn pockets at the I-5 NB ramps is not needed until prior to occupancy of the first office building. Lastly, since the impact to the Del Mar Heights Road / I-5 NB ramps intersection is cumulative, the provision of the improved WB right turn lane(s) is not needed until prior to occupancy of the first office building.

The current expected order for the completion of the three components is retail, then residential and then the office. This order is subject to change. For the mitigation conditioned upon the occupancy of the first office building, those mitigations will need to be completed prior to the occupancy of the office building, even if the office building is constructed first.

TECHNICAL APPENDICES
NEW ONE PASEO PROJECT

San Diego, California
February 10, 2016

LLG Ref. 3-10-1999

**Linscott, Law &
Greenspan, Engineers**

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APPENDIX A

INTERSECTION AND SEGMENT COUNT SHEETS AND FIGURES FROM THE *ORIGINAL* REPORT AND THE JANUARY 22, 2015 E-MEMO

True Count
3401 First Ave #123
San Diego, CA 92103

File Name : 6031.12.I 5 NB OFF-RAMP.DEL MAR HEIGHTS RD
Site Code : 00000000
Start Date : 5/5/2009
Page No : 1

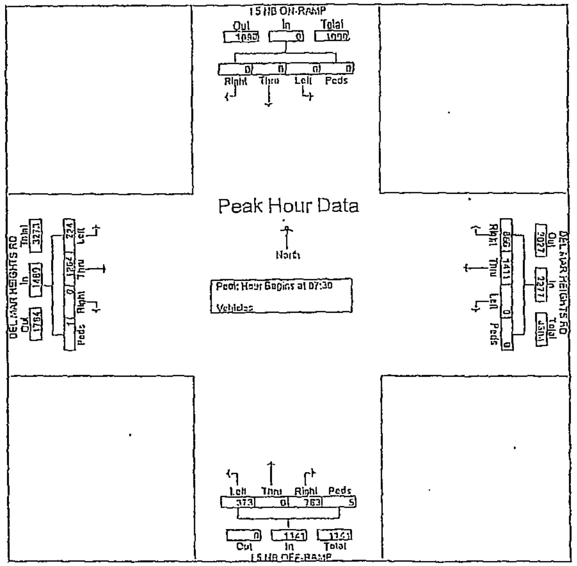
Groups Printed- Vehicles

	I 5 NB ON-RAMP Southbound				DEL MAR HEIGHTS RD Westbound				I 5 NB OFF-RAMP Northbound				DEL MAR HEIGHTS RD Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00	0	0	0	1	0	170	102	0	65	0	127	0	29	229	0	0	723
07:15	0	0	0	0	0	254	188	0	77	0	172	0	48	332	0	0	1071
07:30	0	0	0	0	0	388	181	0	102	0	189	0	58	380	0	1	1299
07:45	0	0	0	0	0	391	204	0	104	0	182	2	58	359	0	0	1300
Total	0	0	0	1	0	1203	675	0	348	0	670	2	193	1300	0	1	4393
08:00	0	0	0	0	0	290	237	0	66	0	183	2	62	285	0	0	1126
08:15	0	0	0	0	0	342	244	0	101	0	209	1	46	239	0	0	1182
08:30	0	0	0	0	0	347	205	0	101	0	206	0	52	262	0	0	1173
08:45	0	0	0	0	0	300	188	0	85	1	183	3	74	253	0	0	1087
Total	0	0	0	0	0	1279	874	0	353	1	781	6	234	1040	0	0	4568
*** BREAK ***																	
16:00	0	0	0	0	0	237	159	0	126	1	130	1	66	258	0	0	978
16:15	0	0	0	1	0	271	172	0	140	0	138	0	67	287	0	0	1076
16:30	0	0	0	0	0	274	202	0	136	0	156	3	65	306	0	0	1142
16:45	0	0	0	1	0	201	167	0	156	0	152	0	64	311	0	0	1052
Total	0	0	0	2	0	983	700	0	558	1	576	4	262	1162	0	0	4248
17:00	0	0	0	0	0	254	221	0	126	0	156	0	68	381	0	0	1206
17:15	0	0	0	0	0	235	218	0	142	0	177	1	61	361	0	0	1195
17:30	0	0	0	2	0	267	193	1	148	1	197	1	58	382	0	0	1250
17:45	0	0	0	0	0	261	164	0	159	9	219	0	48	339	0	0	1239
Total	0	0	0	2	0	1017	796	1	615	10	749	2	235	1463	0	0	4890
Grand Total	0	0	0	5	0	4462	3045	1	1874	12	2776	14	924	4965	0	1	18099
Apprch %	0	0	0	100	0	59.5	40.4	0	40.1	0.3	59.4	0.3	15.7	84.3	0	0	
Total %	0	0	0	0	0	24.8	16.8	0	10.4	0.1	15.3	0.1	5.1	27.4	0	0	

True Count
3401 First Ave #123
San Diego, CA 92103

File Name : 9031.12.I 5 NB OFF-RAMP.DEL MAR HEIGHTS RD
Site Code : 00000000
Start Date : 5/5/2009
Page No : 2

	I 5 NB ON-RAMP Southbound					DEL MAR HEIGHTS RD Westbound					I 5 NB OFF-RAMP Northbound					DEL MAR HEIGHTS RD Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 11:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30																					
07:30	0	0	0	0	0	0	388	181	0	569	102	0	189	0	291	58	380	0	1	439	1299
07:45	0	0	0	0	0	0	391	204	0	595	104	0	182	2	288	58	359	0	0	417	1300
08:00	0	0	0	0	0	0	290	237	0	527	66	0	183	2	251	62	286	0	0	348	1126
08:15	0	0	0	0	0	0	342	244	0	586	101	0	209	1	311	46	239	0	0	285	1182
Total Volume	0	0	0	0	0	0	1411	866	0	2277	373	0	763	5	1141	224	1264	0	1	1489	4907
% App. Total																					
PHF	.000	.000	.000	.000	.000	.000	.902	.887	.000	.957	.897	.000	.913	.625	.917	.903	.832	.000	.250	.848	.944



True Count

3401 First Ave #123
San Diego, CA 92103

File Name : 0031.11.HIGH BLUFF DR.DEL MAR HEIGHTS RD
Site Code : 00000000
Start Date : 5/7/2009
Page No : 1

Groups Printed- Vehicles

	HIGH BLUFF DR Southbound				DEL MAR HEIGHTS RD Westbound				HIGH BLUFF DR Northbound				DEL MAR HEIGHTS RD Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00	5	6	44	0	5	242	0	0	22	3	1	0	16	234	102	0	683
07:15	5	9	54	0	10	332	5	0	30	2	0	0	15	323	99	7	904
07:30	14	22	94	0	12	436	2	0	59	1	3	0	21	352	132	3	1151
07:45	7	12	54	0	24	547	3	0	49	1	2	0	29	348	185	0	1261
Total	31	49	256	0	54	1557	10	0	160	7	6	0	84	1257	518	10	3999
08:00	12	14	73	0	27	349	16	0	47	7	5	0	18	246	177	0	991
08:15	46	9	82	0	29	457	38	0	40	1	3	0	40	233	180	0	1158
08:30	28	17	91	0	30	387	3	0	41	5	4	0	19	195	195	0	1015
08:45	12	14	60	0	30	373	4	0	46	5	3	0	18	234	192	0	991
Total	98	54	306	0	116	1566	61	0	174	18	15	0	95	908	744	0	4155

*** BREAK ***

	HIGH BLUFF DR Southbound				DEL MAR HEIGHTS RD Westbound				HIGH BLUFF DR Northbound				DEL MAR HEIGHTS RD Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
16:00	6	0	23	0	6	312	11	0	109	11	35	0	56	345	47	0	941
16:15	3	6	35	0	10	266	4	0	111	4	11	0	40	330	52	0	872
16:30	6	4	21	0	3	326	7	0	101	10	25	0	51	374	48	0	840
16:45	9	6	21	0	6	353	7	0	130	20	29	0	47	339	47	0	954
Total	24	16	100	0	25	1057	29	0	451	45	[illegible]	0	194	1432	194	0	3647
17:00	8	5	17	0	6	368	8	0	192	10	39	0	60	497	52	0	1162
17:15	6	8	20	0	4	291	5	0	165	14	39	0	70	473	48	0	1143
17:30	6	5	13	0	3	277	9	0	120	22	35	0	54	442	65	0	1051
17:45	7	11	30	0	2	304	6	0	141	19	21	0	58	572	86	0	1257
Total	27	29	80	0	15	1140	28	0	618	65	134	0	242	1984	251	0	4613
Grand Total	180	148	742	0	210	5320	128	0	1403	135	255	0	615	5581	1707	10	16414
Apprch %	16.8	13.8	69.3	0	3.7	94	2.3	0	78.1	7.6	13.3	0	7.6	70.5	21.6	0.1	
Total %	1.1	0.9	4.5	0	1.3	32.4	0.8	0	8.5	0.8	1.4	0	3.7	34	10.4	0.1	

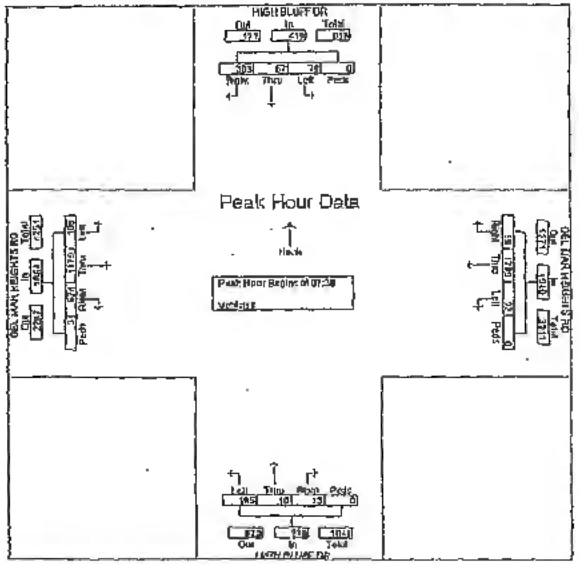
True Count

3401 First Ave #123
San Diego, CA 92103

File Name : 0031.11.HIGH BLUFF DR DEL MAR HEIGHTS RD
Site Code : 00000000
Start Date : 5/7/2009
Page No : 2

Peak Hour Analysis From 07:00 to 17:45 - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:30

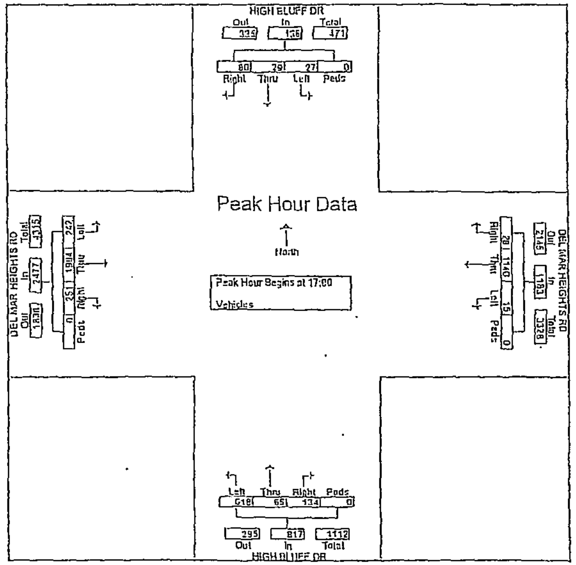
	HIGH BLUFF DR Southbound					DEL MAR HEIGHTS RD Westbound					HIGH BLUFF DR Northbound					DEL MAR HEIGHTS RD Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:30	14	22	94	0	130	12	436	2	0	450	59	1	3	0	63	21	352	132	3	508	1151
07:45	7	12	54	0	73	24	547	3	0	574	49	1	2	0	52	29	348	185	0	562	1261
08:00	12	14	73	0	99	27	349	16	0	392	47	7	5	0	59	18	246	177	0	441	991
08:15	46	9	82	0	137	29	457	38	0	524	40	1	3	0	44	40	233	180	0	453	1158
Total Volume	79	57	303	0	439	92	1789	59	0	1940	195	10	13	0	218	108	1179	674	3	1964	4561
% App. Total																					
PHF	.429	.648	.806	.000	.801	.793	.818	.388	.000	.845	.826	.357	.650	.000	.865	.675	.837	.911	.250	.874	.904



True Count
3401 First Ave #123
San Diego, CA 92103

File Name : 9031.11.HIGH BLUFF DR.DEL MAR HEIGHTS RD
Site Code : 00000000
Start Date : 5/7/2009
Page No : 3

	HIGH BLUFF DR Southbound					DEL MAR HEIGHTS RD Westbound					HIGH BLUFF DR Northbound					DEL MAR HEIGHTS RD Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 17:00																					
17:00	8	5	17	0	30	6	268	8	0	282	192	10	39	0	241	60	497	52	0	609	1162
17:15	6	8	20	0	34	4	291	5	0	300	165	14	39	0	218	70	473	48	0	591	1143
17:30	6	5	13	0	24	3	277	9	0	289	120	22	35	0	177	54	442	65	0	561	1051
17:45	7	11	30	0	48	2	304	6	0	312	141	19	21	0	181	58	572	86	0	716	1257
Total Volume	27	29	80	0	136	15	1140	28	0	1183	618	65	134	0	817	242	1984	251	0	2477	4613
% App. Total																					
PHF	.844	.659	.667	.000	.708	.625	.938	.778	.000	.948	.805	.739	.859	.000	.848	.864	.867	.730	.000	.865	.917



True Count
3401 First Ave #123
San Diego, CA 92103

File Name : 9031.10.EL CAMINO REAL.DEL MAR HEIGHTS RD
Site Code : 00000000
Start Date : 5/7/2009
Page No : 1

Groups Printed- Vehicles

	EL CAMINO REAL Southbound				DEL MAR HEIGHTS RD Westbound				EL CAMINO REAL Northbound				DEL MAR HEIGHTS RD Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00	16	24	49	1	16	178	10	3	19	13	17	0	22	178	18	4	568
07:15	44	36	78	0	18	234	14	0	31	10	26	0	45	257	19	0	812
07:30	44	55	109	0	40	368	19	0	48	18	27	1	64	316	23	0	1132
07:45	54	69	115	0	51	303	14	0	65	17	15	1	58	234	45	1	1042
Total	158	184	351	1	125	1083	57	3	163	58	85	2	189	985	105	5	3554
08:00	25	76	84	1	41	318	34	0	42	27	19	0	39	174	69	3	952
08:15	36	87	97	4	56	351	25	1	51	37	15	0	53	143	58	0	1014
08:30	37	68	87	0	41	329	23	0	49	34	16	1	53	134	58	1	931
08:45	31	54	106	2	32	199	12	0	41	35	17	0	46	140	56	0	771
Total	129	285	374	7	170	1197	94	1	183	133	67	1	191	591	241	4	3668
*** BREAK ***																	
16:00	39	28	63	1	11	184	40	1	61	62	31	0	72	207	70	0	890
16:15	25	32	59	1	30	157	28	0	50	60	21	3	103	190	72	1	832
16:30	33	28	44	7	22	157	29	0	36	61	45	0	101	234	74	0	871
16:45	39	41	52	0	25	176	34	0	68	92	42	0	112	233	60	0	974
Total	136	129	218	9	88	674	131	1	235	275	139	3	388	864	276	1	3567
17:00	41	35	39	2	31	181	39	0	61	94	43	0	87	343	94	2	1092
17:15	25	36	46	0	25	195	41	2	75	104	51	1	124	329	89	2	1145
17:30	35	46	51	0	23	186	52	0	62	105	73	0	97	285	57	2	1074
17:45	46	29	55	0	23	179	44	0	59	91	71	3	131	394	104	3	1232
Total	147	146	191	2	102	741	176	2	257	394	238	4	439	1351	344	9	4543
Grand Total	570	744	1134	19	485	3695	458	7	838	860	529	10	1207	3791	966	19	15332
Apprch %	23.1	30.2	46	0.8	10.4	79.5	9.9	0.2	37.5	38.4	23.6	0.4	20.2	63.4	16.1	0.3	
Total %	3.7	4.9	7.4	0.1	3.2	24.1	3	0	5.5	5.6	3.5	0.1	7.9	24.7	6.3	0.1	

True Count
3401 First Ave #123
San Diego, CA 92103

File Name : 9031.19.EL CAMINO REAL.MALL DRWY
Site Code : 00000000
Start Date : 5/5/2009
Page No : 1

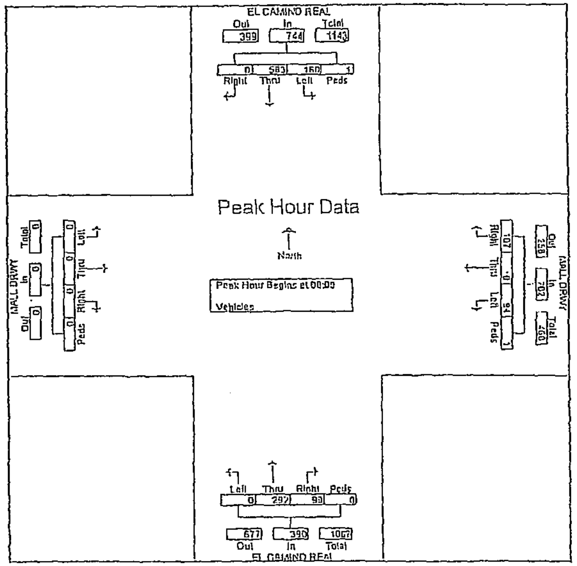
Groups Printed- Vehicles

	EL CAMINO REAL Southbound				MALL DRWY Westbound				EL CAMINO REAL Northbound				MALL DRWY Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00	21	44	0	0	6	0	6	2	0	47	7	0	0	0	0	0	133
07:15	13	79	0	0	11	0	10	0	0	62	24	0	0	0	0	0	199
07:30	12	112	0	0	16	0	13	4	0	90	15	0	0	0	0	0	262
07:45	20	139	0	1	18	0	10	0	0	77	6	0	0	0	0	0	271
Total	66	374	0	1	51	0	39	6	0	276	52	0	0	0	0	0	865
08:00	43	152	0	1	20	0	23	0	0	71	19	0	0	0	0	0	329
08:15	36	195	0	0	18	0	34	1	0	82	22	0	0	0	0	0	388
08:30	44	131	0	0	24	0	27	0	0	76	28	0	0	0	0	0	330
08:45	37	105	0	0	32	0	23	0	0	63	29	0	0	0	0	0	289
Total	160	583	0	1	94	0	107	1	0	292	98	0	0	0	0	0	1336
*** BREAK ***																	
16:00	50	71	0	0	23	0	48	2	0	114	50	0	0	0	0	0	358
16:15	49	73	0	0	24	0	50	0	0	102	36	2	0	0	0	0	336
16:30	56	58	0	0	44	0	49	3	0	118	43	3	0	0	0	0	374
16:45	74	70	0	0	49	0	63	2	0	127	43	1	0	0	0	0	429
Total	229	272	0	0	140	0	210	7	0	461	172	6	0	0	0	0	1497
17:00	59	65	0	0	60	0	77	7	0	140	53	4	0	0	0	0	465
17:15	77	100	0	0	42	0	52	5	0	163	37	0	0	0	0	0	476
17:30	77	63	0	0	35	0	45	1	0	169	39	0	0	0	0	0	429
17:45	73	90	0	3	51	0	74	12	0	147	34	0	0	0	0	0	484
Total	286	318	0	3	188	0	248	25	0	619	163	4	0	0	0	0	1854
Grand Total	741	1547	0	5	473	0	604	39	0	1648	485	10	0	0	0	0	5552
Apprch %	32.3	67.5	0	0.2	42.4	0	54.1	3.5	0	76.9	22.6	0.5	0	0	0	0	
Total %	13.3	27.9	0	0.1	8.5	0	10.9	0.7	0	29.7	8.7	0.2	0	0	0	0	

True Count
3401 First Ave #123
San Diego, CA 92103

File Name : 9031.10.EL CAMINO REAL.MALL DRWY
Site Code : 00000000
Start Date : 5/5/2009
Page No : 2

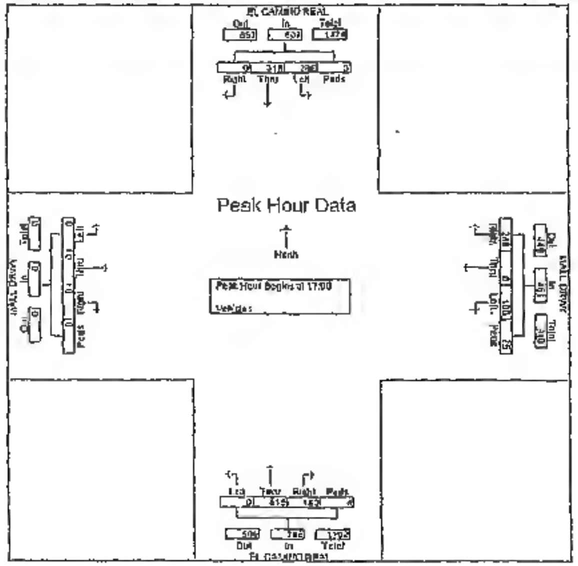
	EL CAMINO REAL Southbound					MALL DRWY Westbound					EL CAMINO REAL Northbound					MALL DRWY Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 11:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00																					
08:00	43	152	0	1	196	20	0	23	0	43	0	71	19	0	90	0	0	0	0	0	329
08:15	36	195	0	0	231	18	0	34	1	53	0	82	22	0	104	0	0	0	0	0	388
08:30	44	131	0	0	175	24	0	27	0	51	0	76	28	0	104	0	0	0	0	0	330
08:45	37	105	0	0	142	32	0	23	0	55	0	63	29	0	92	0	0	0	0	0	289
Total Volume	160	583	0	1	744	94	0	107	1	202	0	292	98	0	390	0	0	0	0	0	1336
% App. Total	21.5	78.4	0	0.1		46.5	0	53	0.5		0	74.9	25.1	0		0	0	0	0		
PHF	.909	.747	.000	.250	.805	.734	.000	.787	.250	.918	.000	.890	.845	.000	.938	.000	.000	.000	.000	.000	.861



True Count
3401 First Ave #123
San Diego, CA 92103

File Name : 9031.19.EL CAMINO REAL.MALL DRWY
Site Code : 00000000
Start Date : 5/5/2009
Page No : 3

	EL CAMINO REAL Southbound					MALL DRWY Westbound					EL CAMINO REAL Northbound					MALL DRWY Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 17:00																					
17:00	59	65	0	0	124	60	0	77	7	144	0	140	53	4	197	0	0	0	0	0	465
17:15	77	100	0	0	177	42	0	52	5	99	0	163	37	0	200	0	0	0	0	0	476
17:30	77	63	0	0	140	35	0	45	1	81	0	160	39	0	199	0	0	0	0	0	429
17:45	73	90	0	3	166	51	0	74	12	137	0	157	34	0	191	0	0	0	0	0	484
Total Volume	286	318	0	3	607	188	0	248	25	461	0	619	163	4	786	0	0	0	0	0	1854
% App. Total	47.1	52.4	0	0.5		40.8	0	53.8	5.4		0	78.8	20.7	0.5		0	0	0	0		
PHF	.929	.795	.000	.250	.857	.783	.000	.805	.521	.800	.000	.916	.769	.250	.945	.000	.000	.000	.000	.000	.958



True Count
3401 First Ave #123
San Diego, CA 92103

File Name : 9031.20.CARMEL COUNTRY RD.TOWNGATE DR
Site Code : 00000000
Start Date : 5/7/2009
Page No : 1

Groups Printed- Vehicles

	CARMEL COUNTRY RD Southbound				MCGUIRE DR Westbound				CARMEL COUNTRY RD Northbound				TOWNGATE DR Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00	11	49	5	0	4	15	24	2	8	42	0	2	6	5	9	1	183
07:15	20	75	10	0	3	12	31	1	9	65	6	1	13	16	8	6	276
07:30	11	119	25	1	12	45	67	3	13	114	9	8	31	23	16	1	498
07:45	21	149	27	1	4	34	34	1	21	85	2	3	26	13	19	2	442
Total	63	392	67	2	23	106	156	7	51	305	17	14	76	57	52	10	1399
08:00	28	105	27	1	11	37	33	10	24	105	3	21	24	16	26	11	485
08:15	30	101	63	11	16	61	28	6	30	107	2	58	48	25	31	21	640
08:30	21	78	45	12	14	57	54	10	36	67	0	40	52	29	37	13	565
08:45	16	82	13	8	3	13	30	7	17	68	1	4	17	7	16	4	306
Total	95	366	148	32	44	168	145	35	107	347	6	126	141	77	110	49	1996
*** BREAK ***																	
16:00	34	116	19	0	2	9	29	2	21	76	1	1	18	21	19	0	368
16:15	44	110	17	5	1	13	25	2	25	80	0	5	22	11	26	10	401
16:30	37	75	16	9	1	15	22	2	25	97	2	5	31	23	52	7	403
16:45	39	90	15	5	1	11	31	0	29	106	4	3	20	18	28	8	398
Total	154	403	67	19	5	48	97	6	100	359	7	14	91	73	125	25	1593
17:00	48	144	23	1	2	12	28	0	25	100	0	0	22	17	39	4	465
17:15	30	101	18	5	5	9	30	2	30	90	3	5	35	20	46	5	434
17:30	49	113	14	5	3	18	32	3	22	138	4	1	30	38	50	2	522
17:45	55	135	13	2	4	15	25	5	36	124	3	2	23	30	38	9	519
Total	182	493	68	13	14	54	115	10	113	452	10	8	110	105	173	20	1940
Grand Total	494	1654	350	66	86	376	513	58	371	1464	40	162	418	312	460	104	6928
Apprch %	19.3	64.5	13.7	2.6	8.3	36.4	49.7	5.6	18.2	71.9	2	8	32.3	24.1	35.5	8	
Total %	7.1	23.9	5.1	1	1.2	5.4	7.4	0.8	5.4	21.1	0.6	2.3	6	4.5	6.6	1.5	

MetroCount Traffic Executive
Event Counts

EventCount-1207 -- English (ENU)

Datasets:

Site:	[9031.11] DEL MAR HEIGHTS RD (HIGH BLUFF DR-I-5 NB RAMPS) WESTBOUND
Input A:	4 - West bound. - Added to totals. (1)
Input B:	2 - East bound. - Excluded from totals. (0)
Survey Duration:	21:42 Wednesday, May 13, 2009 => 7:41 Saturday, May 16, 2009
File:	C:\Users\Gus\True Count\Projects\9031 DEL MAR\9031.11.16May2009.EC0 (Regular)
Identifier:	W558TFAZ MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Event Count
Data type:	Axle sensors - Separate (Count)

Profile:

Filter time:	0:00 Thursday, May 14, 2009 => 0:00 Friday, May 15, 2009
Name:	TC Default Profile
Scheme:	Count events divided by two.
Units:	Non metric (ft, mi, ft/s, mph, lb, ton)
In profile:	Events = 60850 / 110100 (55.27%)

* Thursday, May 14, 2009=24067, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
62	28	32	26	52	180	677	1914	2235	1460	1284	1462	1618	1350	1940	1904	1684	1876	1451	1156	735	508	203	142	
21	13	9	3	9	23	111	302	477	420	326	358	486	352	438	432	428	526	433	316	238	155	101	50	-
15	9	11	4	15	35	127	466	579	346	288	362	376	342	440	458	416	451	351	295	183	131	91	32	-
11	3	8	11	5	57	197	529	609	316	322	350	418	313	522	570	413	442	365	294	167	121	43	37	-
15	3	4	8	23	65	242	617	571	378	348	392	336	343	540	444	427	457	222	251	147	101	48	23	-

AM Peak 0745 - 0845 (2281), AM PHF=0.92

MetroCount Traffic Executive
Event Counts

EventCount-1235 -- English (ENU)

Datasets:

Site:	[9031.12] DEL MAR HEIGHTS RD (BETWEEN I-5 RAMPS) EASTBOUND
Input A:	2 - East bound. - Added to totals. (1)
Input B:	0 - Unused or unknown. - Excluded from totals. (0)
Survey Duration:	19:46 Monday, May 11, 2009 => 12:28 Wednesday, May 13, 2009
File:	C:\Users\Gus\True Count\Projects\9031 DEL MAR\9031.12.E13May2009.EC0 (Regular)
Identifier:	R5098KCT MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Event Count
Data type:	Axle sensors - Separate (Count)

Profile:

Filter time:	0:00 Tuesday, May 12, 2009 => 0:00 Wednesday, May 13, 2009
Name:	TC Default Profile
Scheme:	Count events divided by two.
Units:	Non metric (ft, mi, ft/s, mph, lb, ton)
In profile:	Events = 19372 / 20947 (92.48%)

* Tuesday, May 12, 2009=19372, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
71	35	25	22	32	158	462	1529	1256	1037	917	1119	1276	1213	1523	1541	1463	1573	1414	1026	727	506	267	160	
18	9	3	8	6	15	59	249	334	290	233	267	330	269	371	390	358	375	392	264	190	143	82	40	-
22	8	14	4	6	25	93	420	294	266	230	291	316	270	349	300	382	410	352	269	200	148	86	46	-
9	8	3	4	0	42	116	453	300	242	242	270	327	324	405	385	365	430	335	259	175	116	54	35	-
22	10	5	6	12	76	194	407	328	239	212	291	303	330	398	378	370	358	331	234	162	99	45	31	-

AM Peak 0715 - 0815 (1614), AM PHF=0.89

40,080

MetroCount Traffic Executive
Event Counts

EventCount-1236 -- English (ENU)

Datasets:

Site:	[9031.12] DEL MAR HEIGHTS RD (BETWEEN I-5 RAMPS) WESTBOUND
Input A:	4 - West bound. - Added to totals. (1)
Input B:	0 - Unused or unknown. - Excluded from totals. (0)
Survey Duration:	19:45 Monday, May 11, 2009 => 12:27 Wednesday, May 13, 2009
File:	C:\Users\Gus\True Count\Projects\9031 DEL MAR\9031.12.W13May2009.EC0 (Regular)
Identifier:	R513P5FW MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Event Count
Data type:	Axle sensors - Separate (Count)

Profile:

Filter time:	0:00 Tuesday, May 12, 2009 => 0:00 Wednesday, May 13, 2009
Name:	TC Default Profile
Scheme:	Count events divided by two.
Units:	Non metric (ft, mi, ft/s, mph, lb, ton)
In profile:	Events = 20719 / 22289 (92.96%)

* Tuesday, May 12, 2009=20718, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
58	35	32	30	40	189	598	1569	1606	1327	1093	1280	1392	1267	1496	1574	1547	1585	1357	939	588	456	332	144	
15	7	8	3	7	31	82	262	393	330	270	271	416	313	342	344	361	389	376	251	176	123	114	50	-
18	11	7	9	7	33	124	323	443	323	283	273	350	325	365	403	355	445	369	274	132	129	87	31	-
14	11	11	10	8	54	176	473	460	355	262	345	325	309	373	426	417	430	289	211	136	124	72	33	-
11	10	6	8	18	71	216	511	390	314	278	351	301	320	416	401	411	421	323	203	144	80	59	30	-

AM Peak 0730 - 0830 (1820), AM PHF=0.89

MetroCount Traffic Executive
Event Counts

EventCount-1209 – English (ENU)

Datasets:

Site:	[9031.13] DEL MAR HEIGHTS RD (I-5 SB RAMPS-PORTOFINO DR) EASTBOUND
Input A:	2 - East bound. - Added to totals. (1)
Input B:	0 - Unused or unknown. - Excluded from totals. (0)
Survey Duration:	21:56 Wednesday, May 13, 2009 => 7:38 Saturday, May 16, 2009
File:	C:\Users\Gus\True Count\Projects\9031 DEL MAR\9031.13.E16May2009.EC0 (Regular)
Identifier:	W139N0DA MC56-L5 [MC55] (c)Microcom 19Oct04
Algorithm:	Event Count
Data type:	Axle sensors - Separate (Count)

Profile:

Filter time:	0:00 Thursday, May 14, 2009 => 0:00 Friday, May 15, 2009
Name:	TC Default Profile
Scheme:	Count events divided by two.
Units:	Non metric (ft, mi, ft/s, mph, lb, ton)
In profile:	Events = 17132 / 31367 (54.62%)

* Thursday, May 14, 2009=17131, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
77	40	29	24	48	131	439	1226	1212	1057	945	989	1232	1160	1381	1270	1153	1308	1119	732	620	470	251	142	
29	10	8	5	11	32	68	176	366	270	243	240	279	315	272	318	318	310	321	232	167	130	74	40	-
23	16	5	7	7	39	70	325	362	271	204	256	333	293	300	307	274	358	293	194	177	114	81	34	-
12	8	5	7	10	35	137	362	274	268	257	231	313	286	408	324	285	319	253	185	152	121	45	39	-
13	6	7	5	20	45	164	353	270	248	251	262	307	272	401	299	276	291	252	101	124	97	51	29	-

AM Peak 0715 - 0815 (1416), AM PHF=0.97

367
086

FIGURE 3-1

Project Only Distribution Percentages

(Project Build-out)

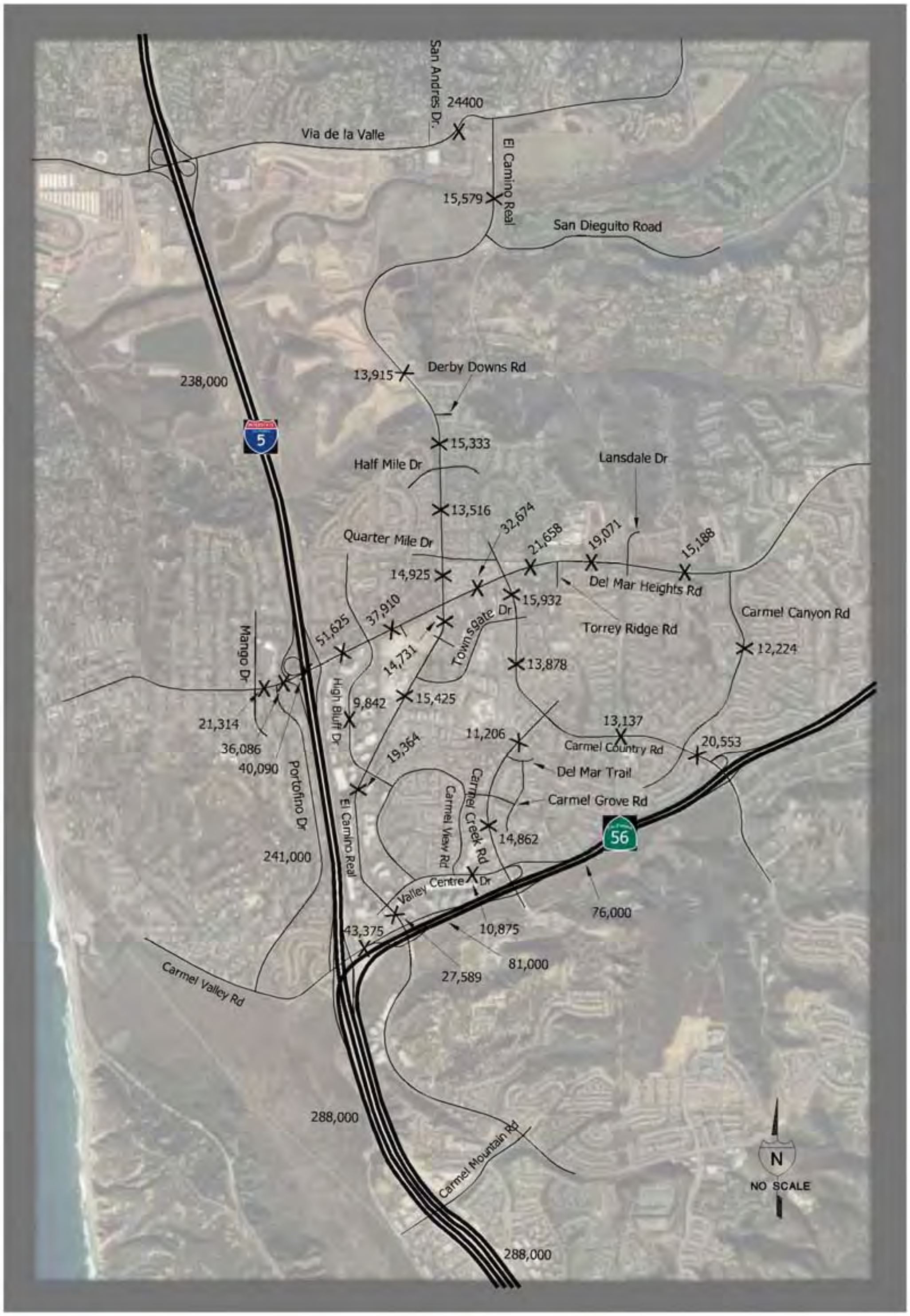
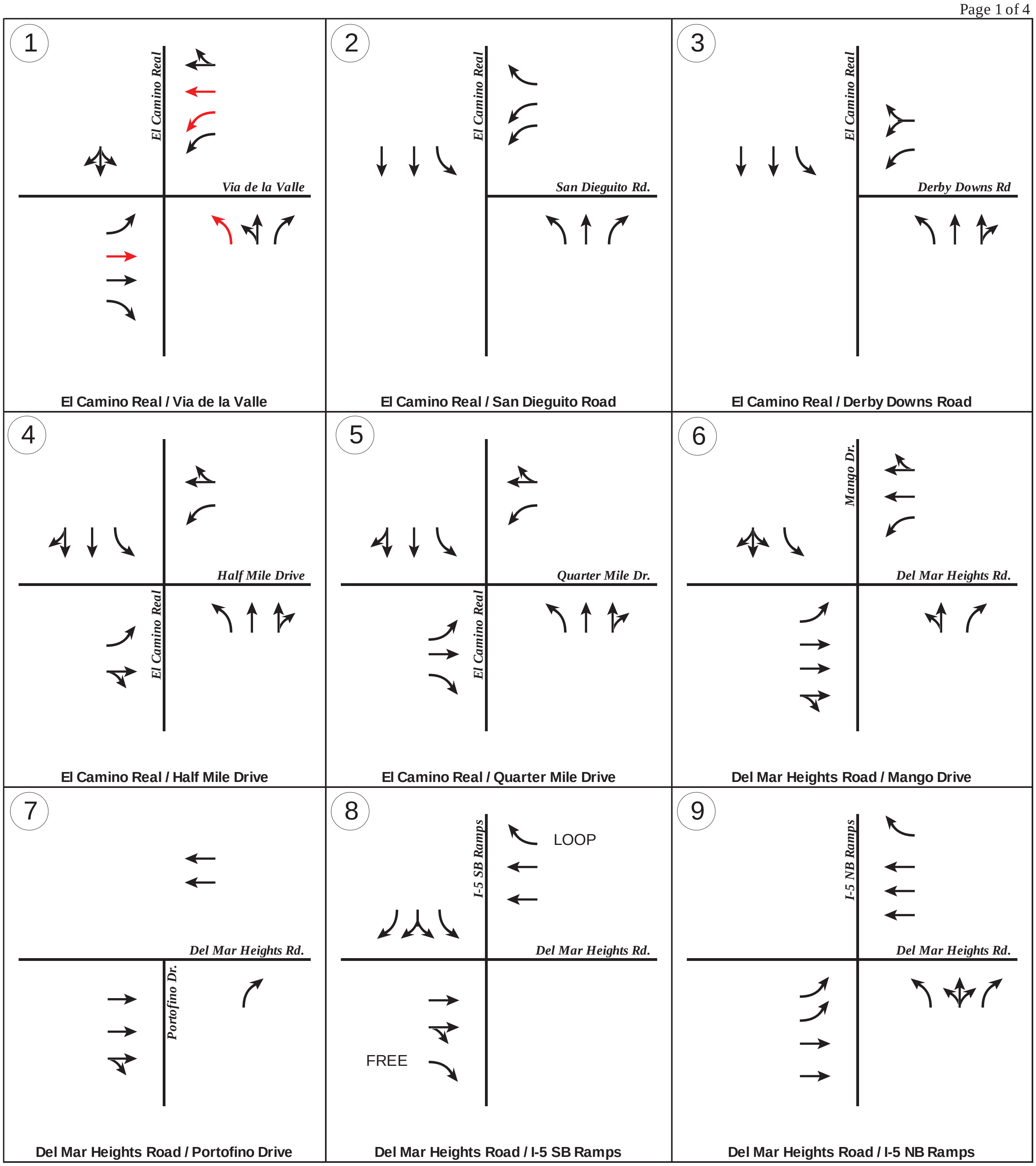


FIGURE 5-1

Existing Average Daily Traffic

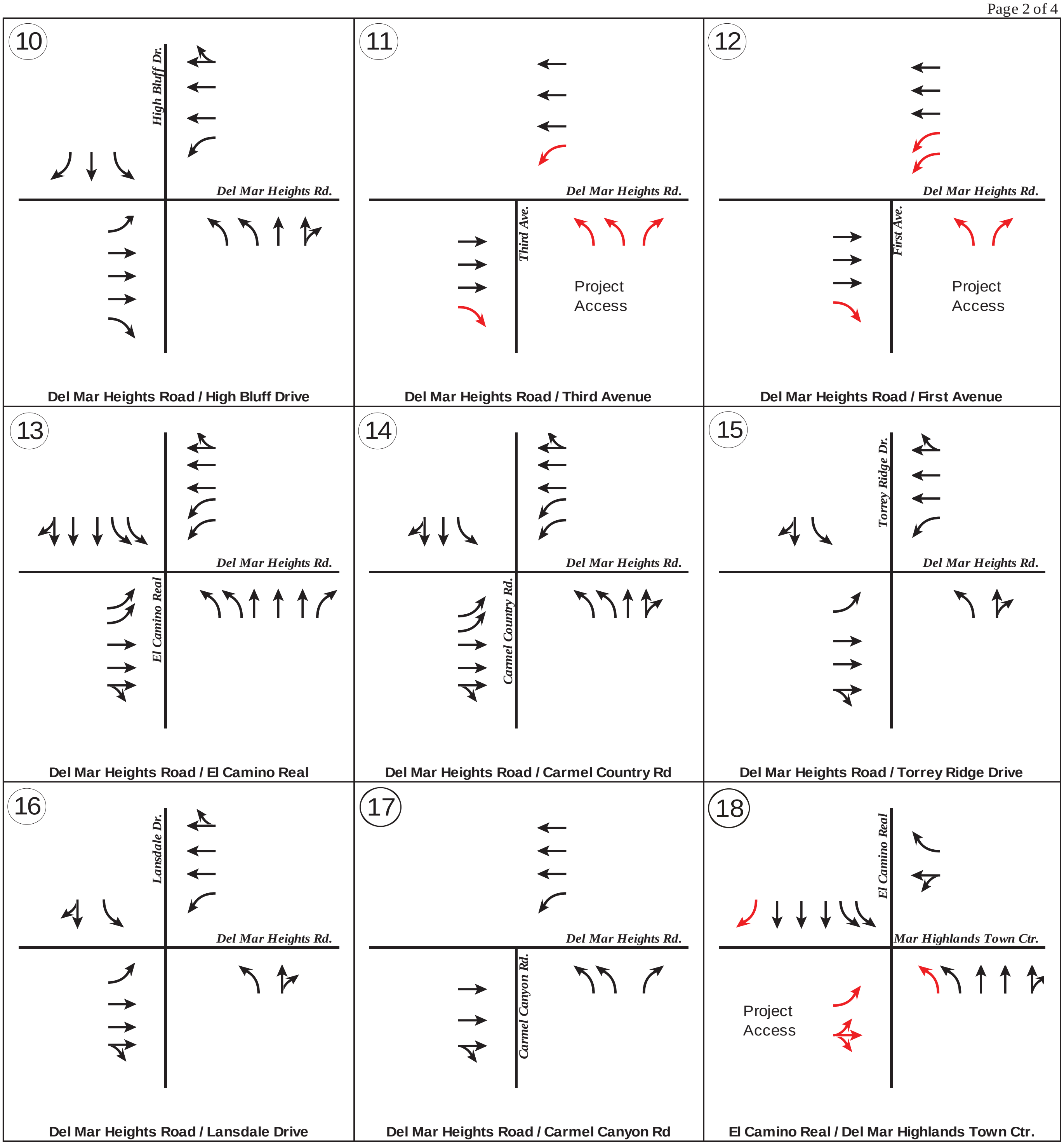
Page 1 of 4



***The red arrows in Intersection #1 are planned lane configurations in the Year 2030 scenarios. See discussion in Section 5.4 of the report.**

FIGURE 5-2

Existing Lane Configurations



***The red arrows indicate planned lane configurations when project access is constructed.**

FIGURE 5-2

Existing Lane Configurations

Page 1 of 4

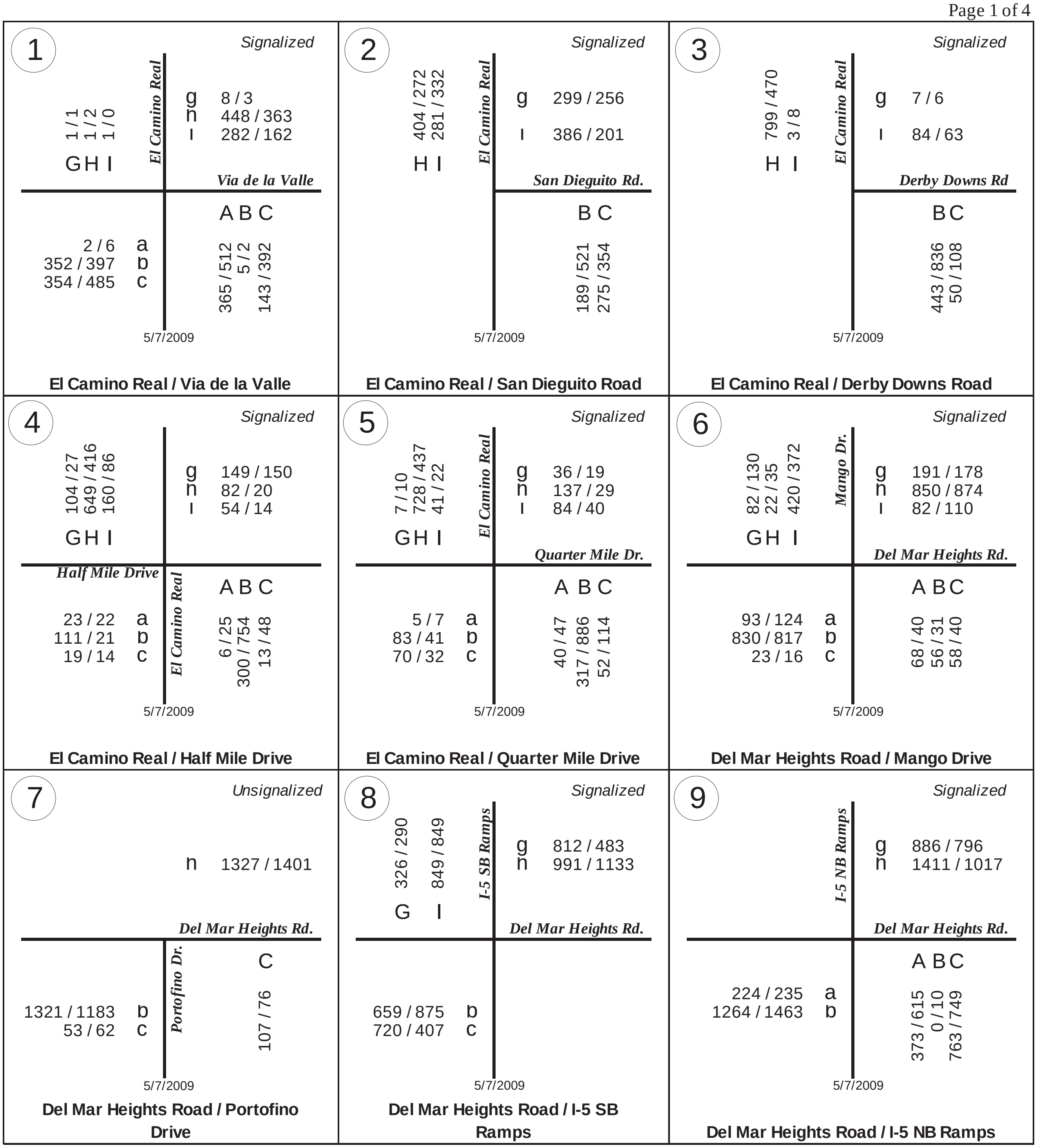


FIGURE 5-3

Existing AM / PM Peak Hour Traffic

Page 2 of 4

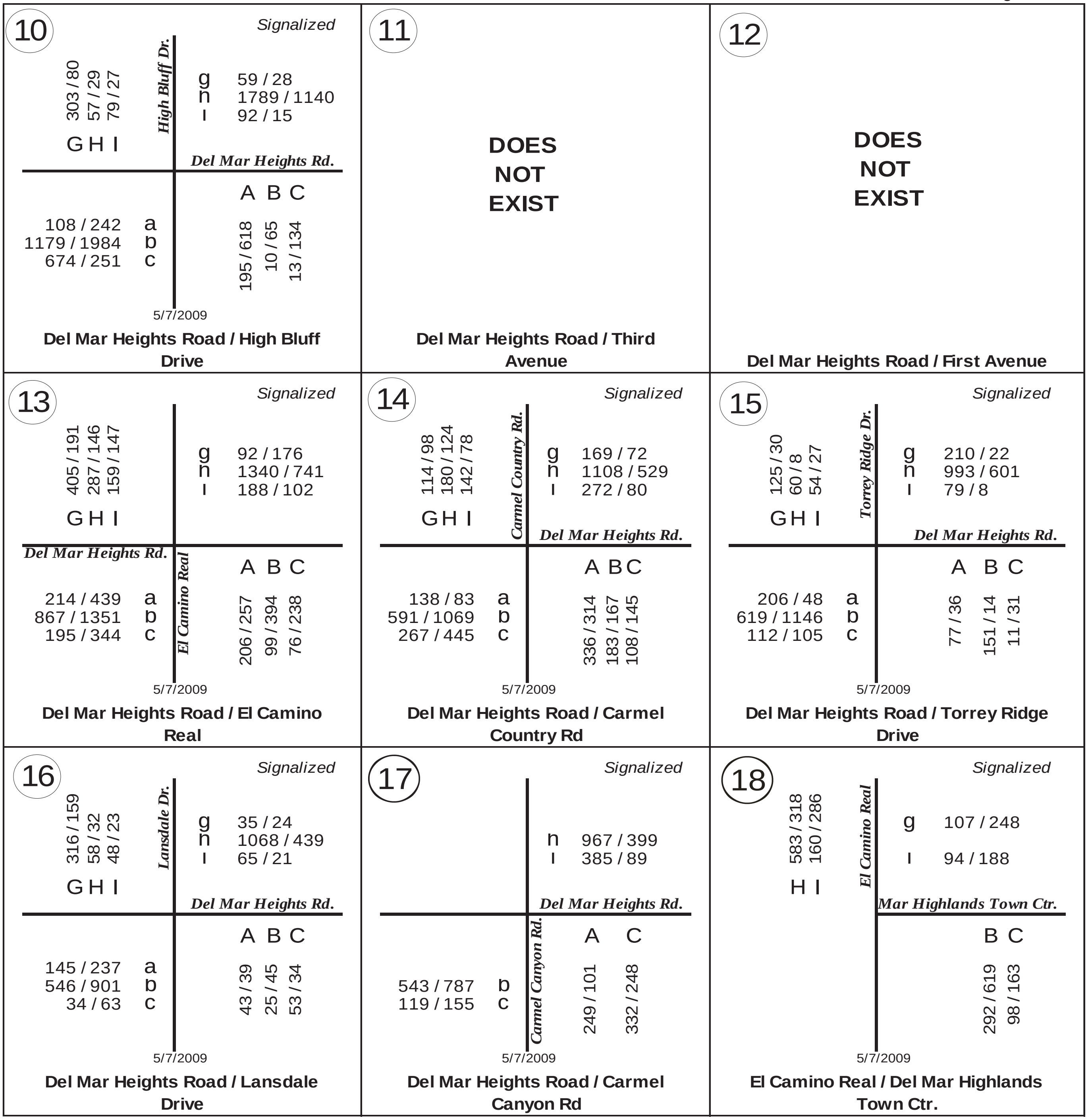


FIGURE 5-3

Existing AM / PM Peak Hour Traffic

FIGURE 7-1

Cumulative Projects Average Daily Traffic Volumes

Page 1 of 4

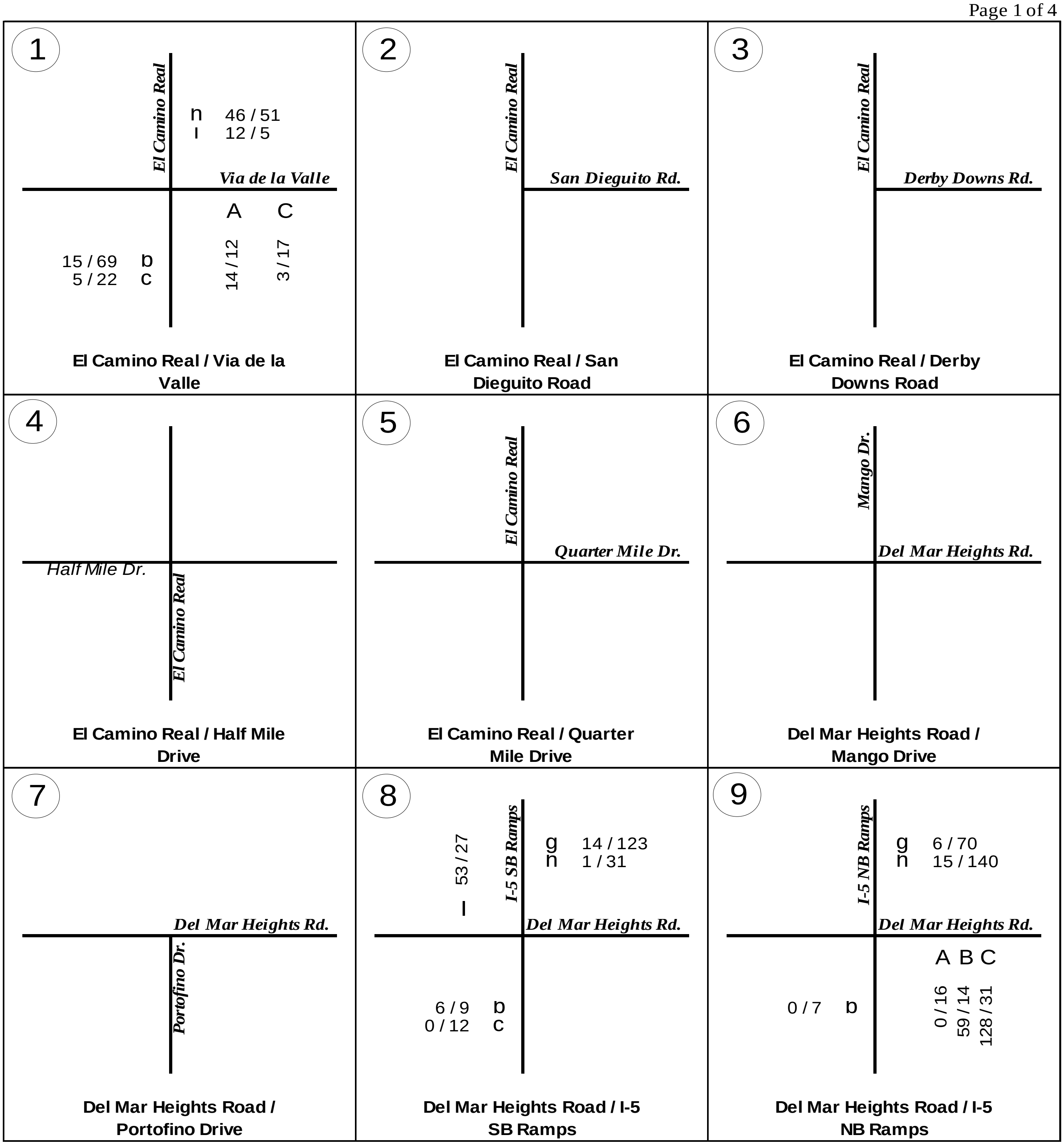


FIGURE 7-2

Cumulative Projects AM/PM Peak Hour Traffic Volumes

Page 2 of 4

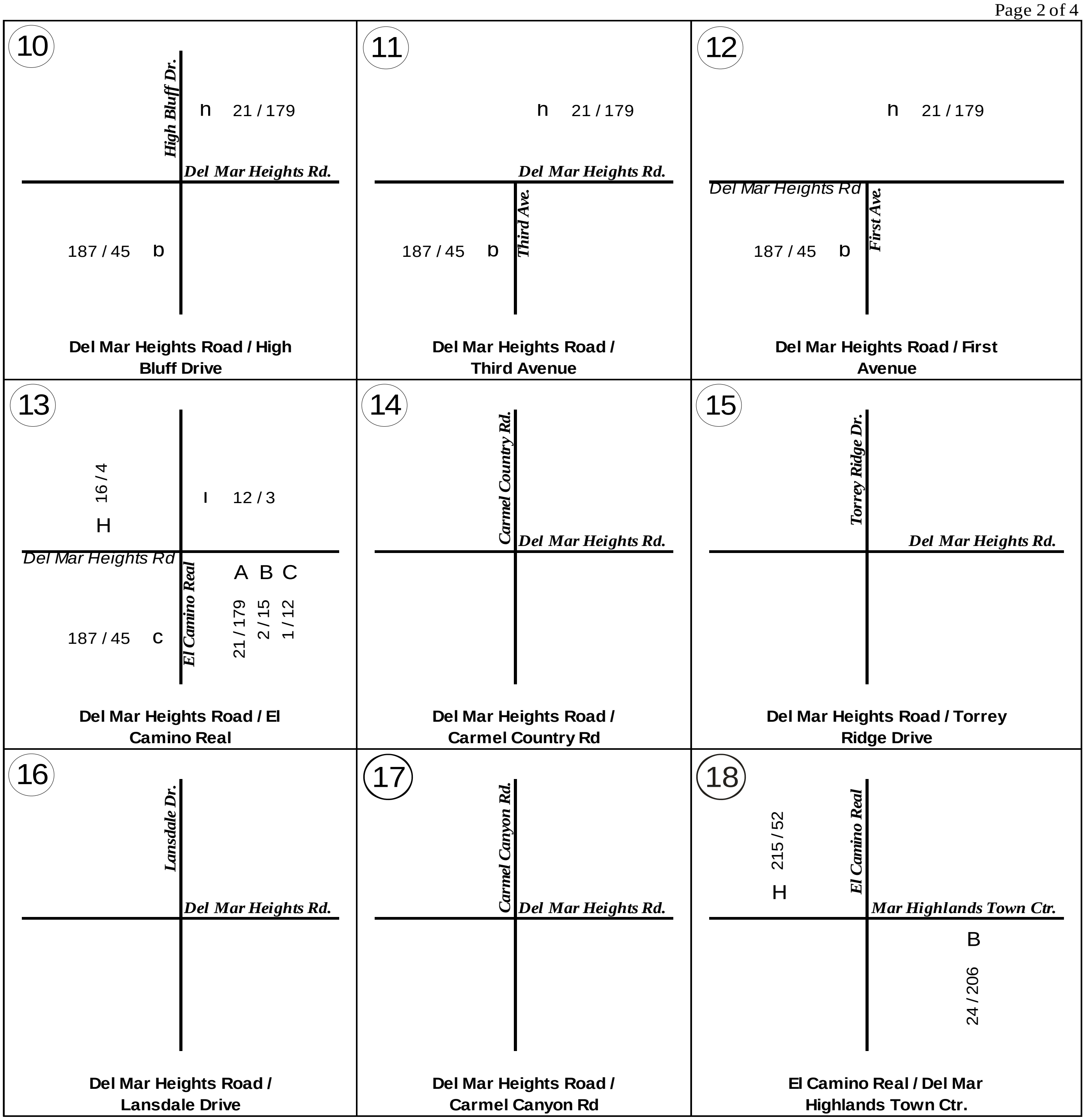


FIGURE 7-2

Cumulative Projects AM/PM Peak Hour Traffic Volumes

Page 3 of 4

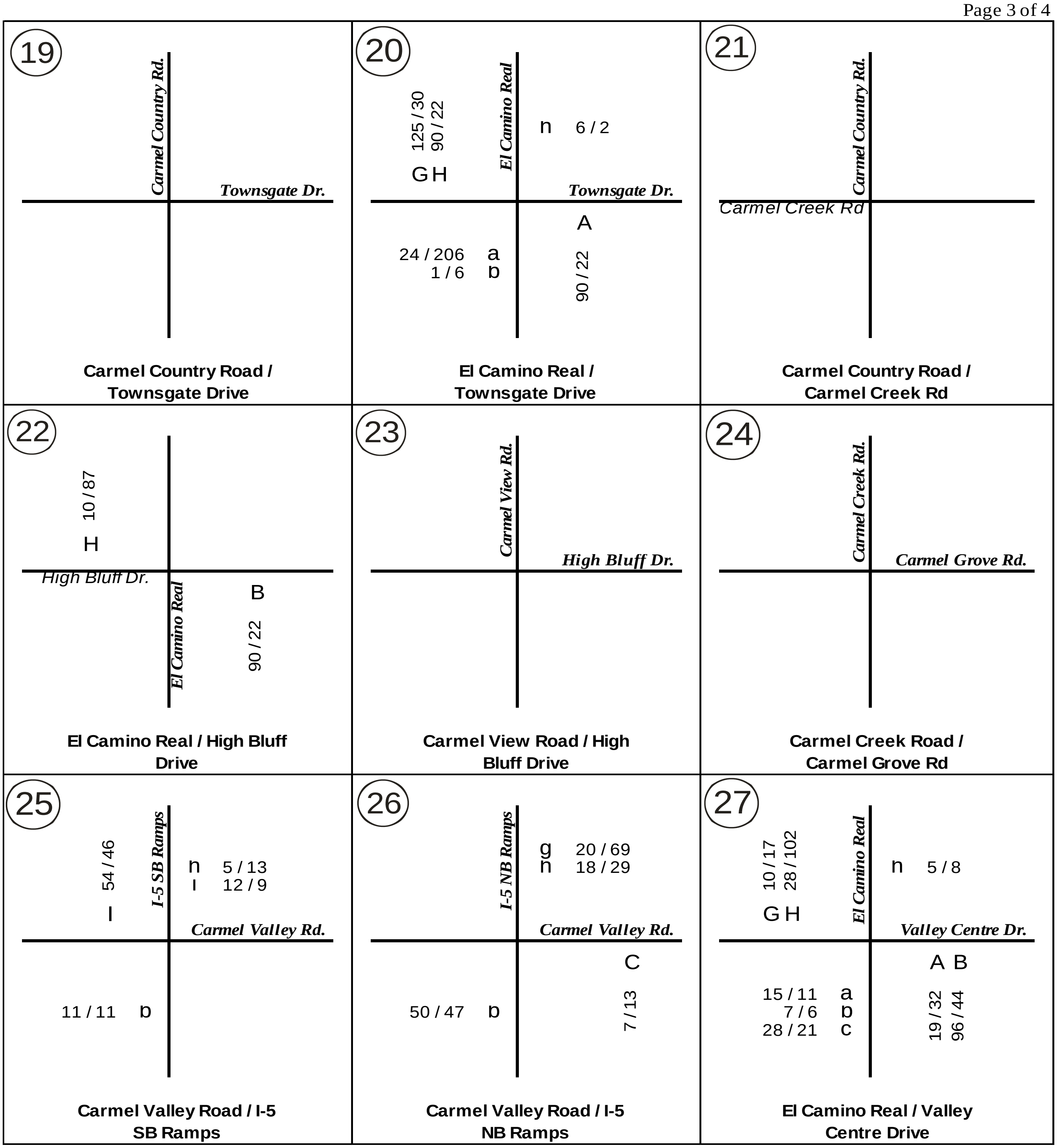


FIGURE 7-2

Cumulative Projects AM/PM Peak Hour Traffic Volumes

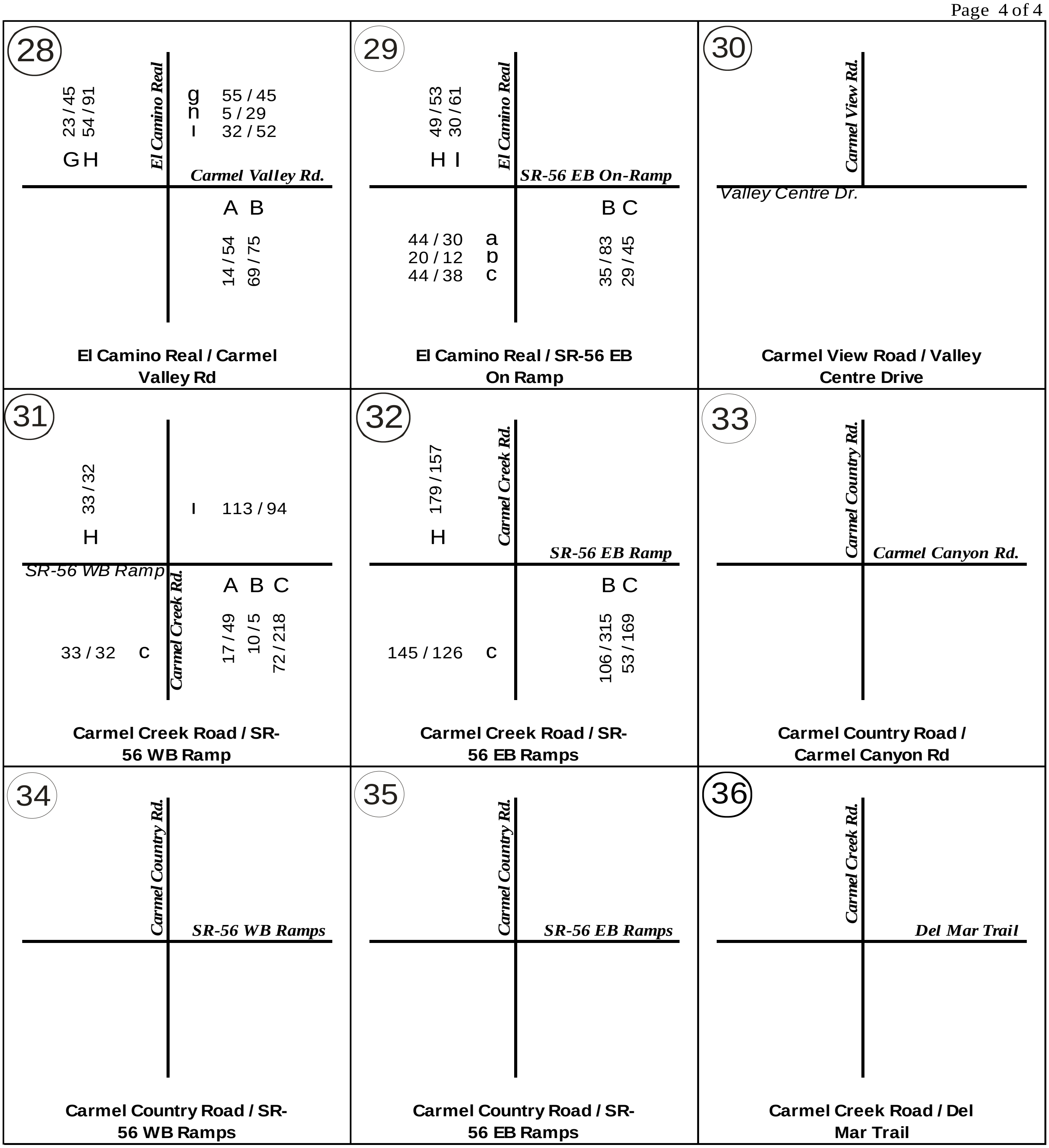


FIGURE 7-2

Cumulative Projects AM/PM Peak Hour Traffic Volumes

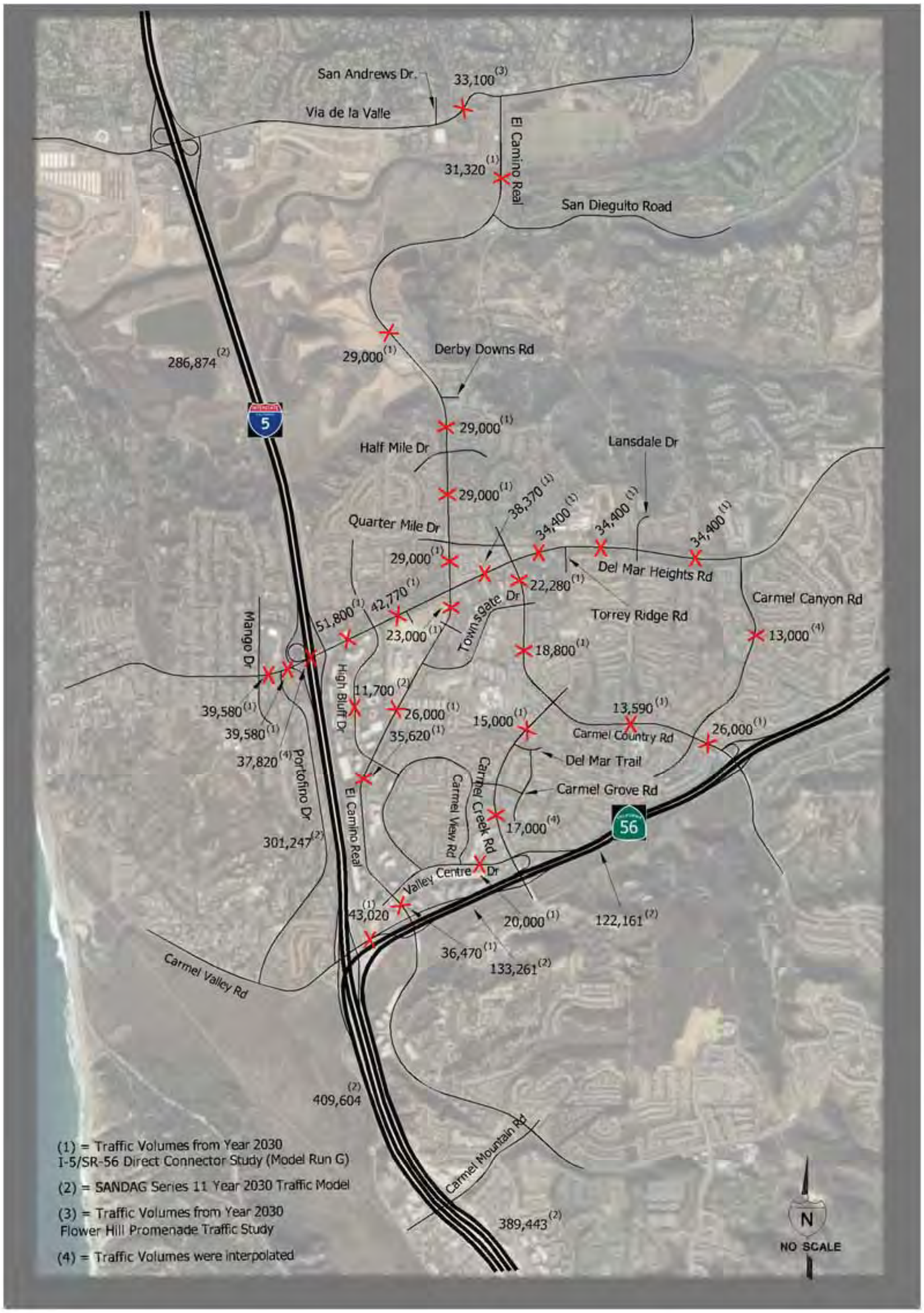
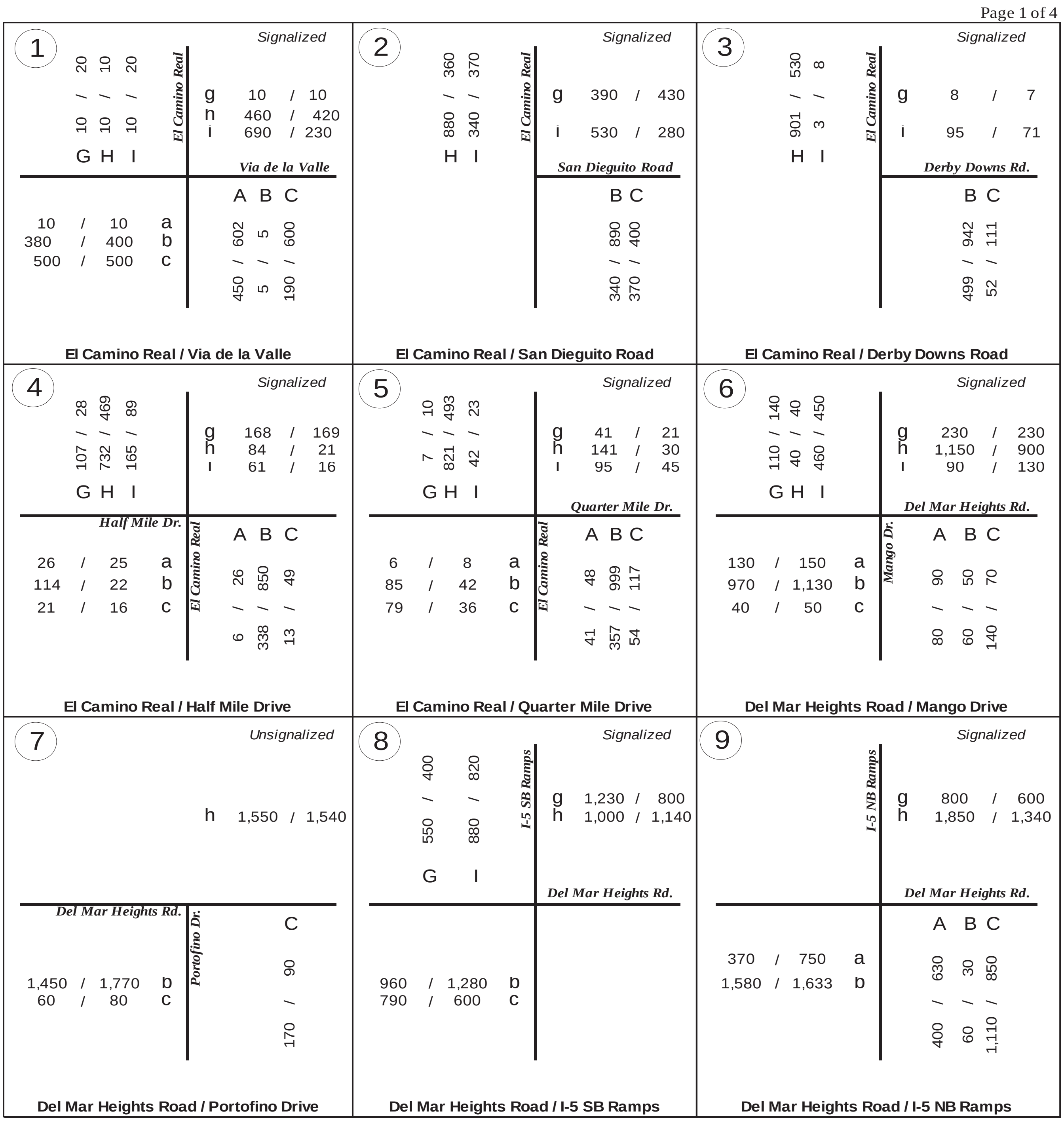


FIGURE 12-1

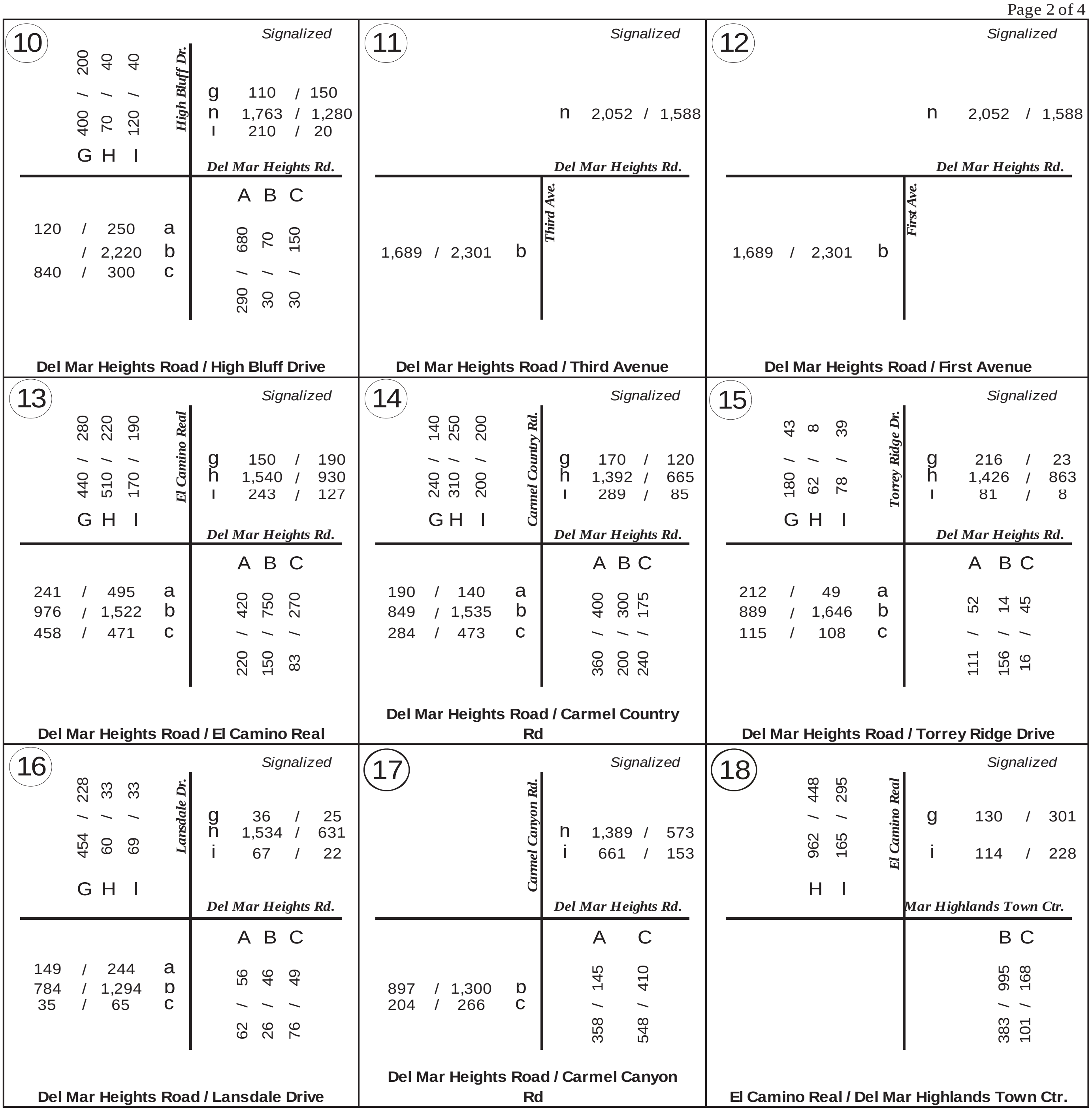
Year 2030 Without Project Average Daily Traffic Volumes



Ints #1,2, & 6-9 show peak hour volumes from the Year 2030 I-5/SR-56 Direct Connector (Model Run G) Traffic Volumes, see Appendix E.

FIGURE 12-2

Year 2030 Without Project AM / PM Peak Hour Traffic Volumes



Ints #10,13,&14 show peak hour volumes from the Year 2030 I-5/SR-56 Direct Connector (Model Run G) Traffic Volumes, see Appendix E.

FIGURE 12-2

Year 2030 Without Project AM / PM Peak Hour Traffic Volumes

URBAN SYSTEMS ASSOCIATES, INC.
PLANNING & TRAFFIC ENGINEERING, MARKETING & PROJECT SUPPORT
CONSULTANTS TO INDUSTRY AND GOVERNMENT

E-MEMO

ATTN:	***Bob Little – Kilroy Realty***	***E-Mail:*** ▼	rlittle@kilroyrealty.com
FROM:	***Andrew P. Schlaefli, PE & Jacob Swim***	***TOTAL PAGES (Including Cover):***	7+Attachments
DATE:	***January 22, 2015*** ***TIME: 9:50:02 AM***	***JOB NUMBER: 002407***	
SUBJECT:	***Del Mar Highlands Town Center Expansion – Near Term Analysis***		

I. INTRODUCTION

In response to a specific request from the lawyer for the owner of Del Mar Highlands Town Center (DMHTC), Urban Systems Associates, Inc. (USAI) has prepared a traffic analysis to determine if any new significant traffic impacts may occur as a result of the proposed accelerated expansion and development of DMHTC recently announced by the property owner and the subject of a newly filed submittal with the City, in the Near Term scenario. The approved traffic analysis dated September 24, 2013 for the Revised Project, also referred to as "The Reduced Main Street Alternative" in the Final Environmental Impact Report (FEIR) includes future (Year 2030) traffic growth from the DMHTC site based on planning projections by SANDAG. Although the FEIR provides a long term (Year 2030) traffic analysis including the DMHTC site, the Near Term analysis does not include the DMHTC Expansion as a cumulative project since there was no application submitted to the City at the time the traffic study was prepared. As previously mentioned, the purpose of this analysis is to determine if there are any new significant traffic impacts with the addition of the DMHTC Expansion in the Near Term scenario which were not previously identified in the FEIR.

In summary, this analysis determined the accelerated expansion of DMHTC does not result in any new significant traffic impacts which were not previously identified in the FEIR. All impacts resulting from the expansion can be mitigated as described by traffic mitigation measures or project features already described in the FEIR.

ATTACHMENT 1

Del Mar Highlands Town Center Expansion Project Trip Generation

Driveway Rates

Use	Amount	Trip*	ADT	AM Peak Hour					PM Peak Hour				
				%*	#	In : Out	In	Out	%*	#	In : Out	In	Out
Community Commercial	100,000 SF	70 /KSF	7,000	3%	210	6 : 4	126	84	10%	700	5 : 5	350	350
TOTAL			**7,000**		**210**		**126**	**84**		**700**		**350**	**350**

Cumulative Rates

Use	Amount	Trip*	ADT	AM Peak Hour					PM Peak Hour				
				%*	#	In : Out	In	Out	%*	#	In : Out	In	Out
Community Commercial	100,000 SF	49 /KSF	4,900	3%	147	6 : 4	88	59	10%	490	5 : 5	245	245
TOTAL			**4,900**		**147**		**88**	**59**		**490**		**245**	**245**

Notes:

* = Source: City of San Diego Trip Generation Manual, May 2003

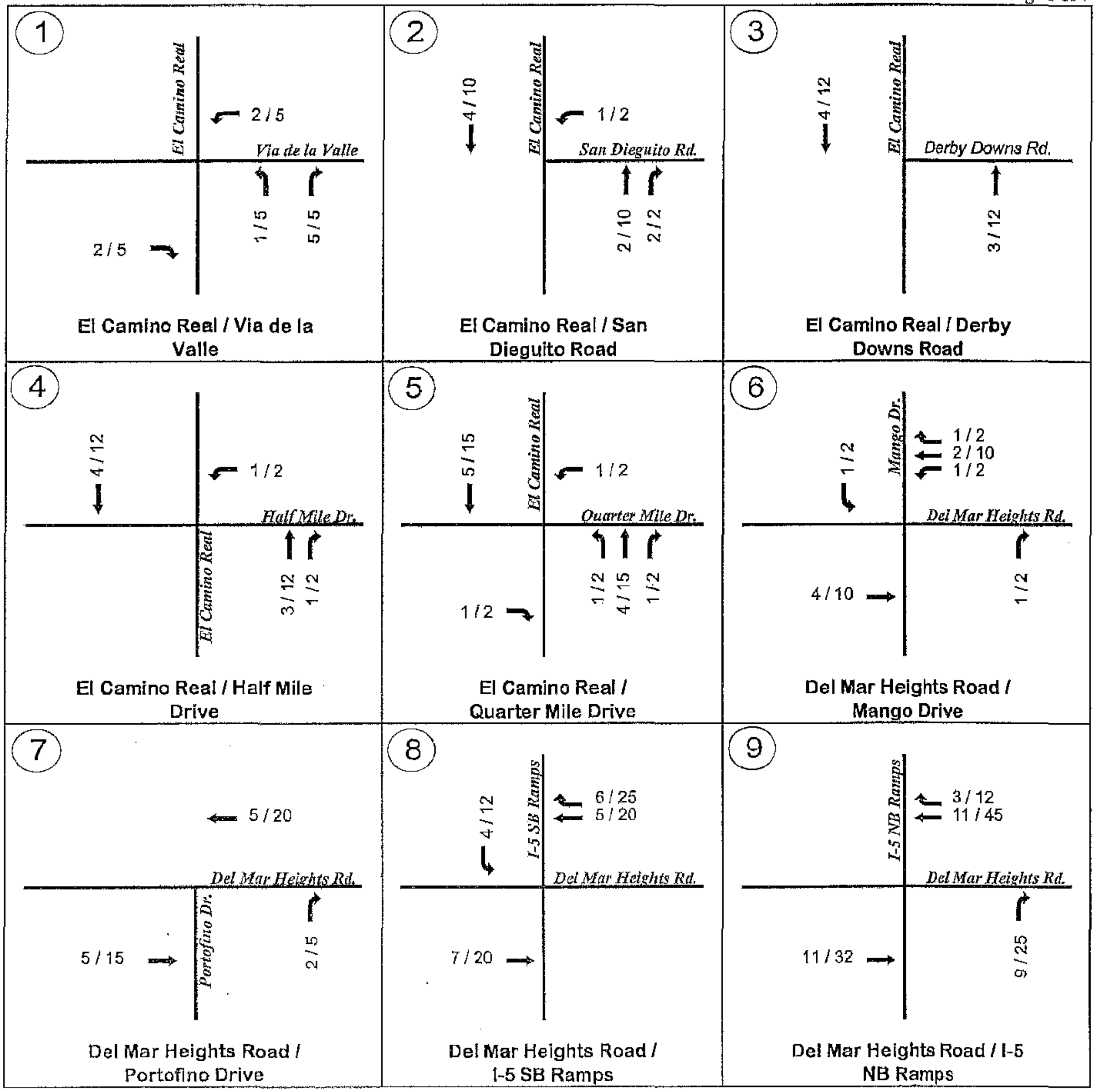
KSF = 1,000 Square Foot

ATTACHMENT 2

DMHTC Expansion Project Only Average Daily Traffic & Distribution

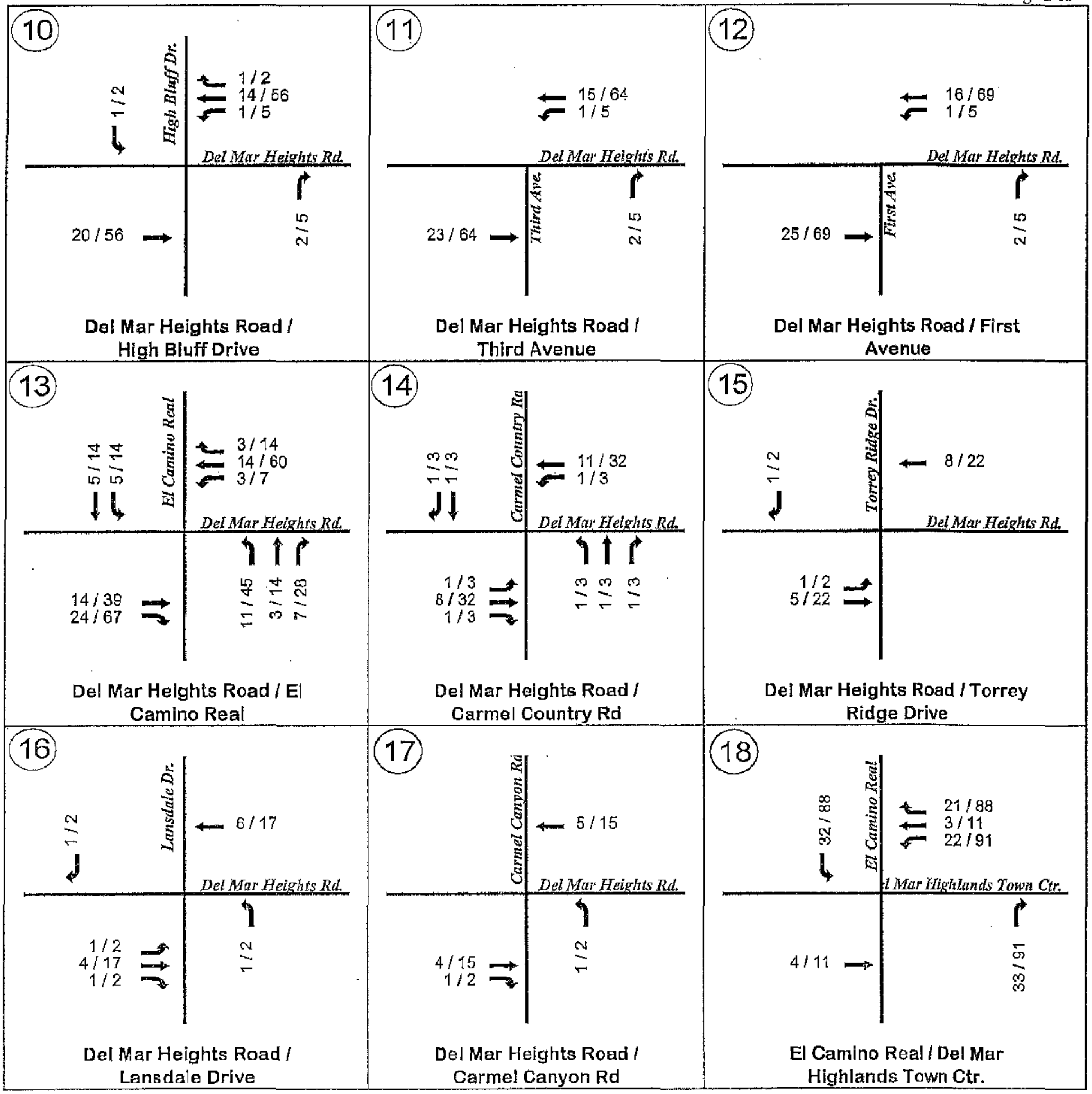
Road	Segment	Distribution Percentage	DMHTC Expansion Project only ADT
Del Mar Heights Rd.	Mango Drive to Portofino Drive	6%	294
	Portofino Drive to I-5 Southbound Ramps	8%	392
	I-5 Southbound Ramps and I-5 Northbound Ramps	15%	735
	I-5 Northbound Ramps to High Bluff Drive	23%	1,127
	High Bluff Drive to Third Avenue	26%	1,274
	Thirth Avenue to First Avenue	28%	1,372
	First Avenue to El Camino Real	30%	1,470
	El Camino Real to Carmel Country Road (D)	23%	1,610
	Carmel Country Road to Torrey Ridge Road	10%	490
	Torrey Ridge Road to Lansdale Drive	9%	441
	Lansdale Drive to Carmel Canyon Road	7%	343
El Camino Real	Via de la Valle to San Dieguito Road	4%	196
	San Dieguito Road to Derby Downs Road	5%	245
	Derby Downs Road to Half Mile Drive	5%	245
	Half Mile Drive to Quarter Mile Drive	6%	294
	Quarter Mile Drive to Del Mar Heights Road	8%	392
	Del Mar Heights Road to Townsgate Drive (D)	26%	1,820
	Townsgate Drive to High Bluff Drive	17%	833
	High Bluff Drive to Valley Centre Drive	13%	637
	Valley Centre Drive to Carmel Valley Road	8%	392
Carmel Country Road	Del Mar Heights Road to Townsgate Drive	13%	637
	Townsgate Drive to Carmel Creek Road	11%	539
	Carmel Creek Road to Carmel Canyon Road	7%	343
	Carmel Canyon Road to SR-56 Westbound Ramps	6%	294
Carmel Canyon Road	Del Mar Heights Road to Carmel Country Road	1%	49
Carmel Creek Road	Carmel Country Road to Carmel Grove Road	2%	98
	Carmel Grove Road to SR-56 Westbound Ramps	1%	49
Valley Centre Drive	Carmel View Road to Carmel Creek Road	1%	49
Carmel Valley Road	I-5 Northbound Ramps to El Camino Real	4%	196
High Bluff Drive	Del Mar Heights Road to El Camino Real	2%	98
Via de la Valle	San Andres Drive to El Camino Real (West)	2%	98

Cumulative = 4,900
Driveway(D) = 7,000



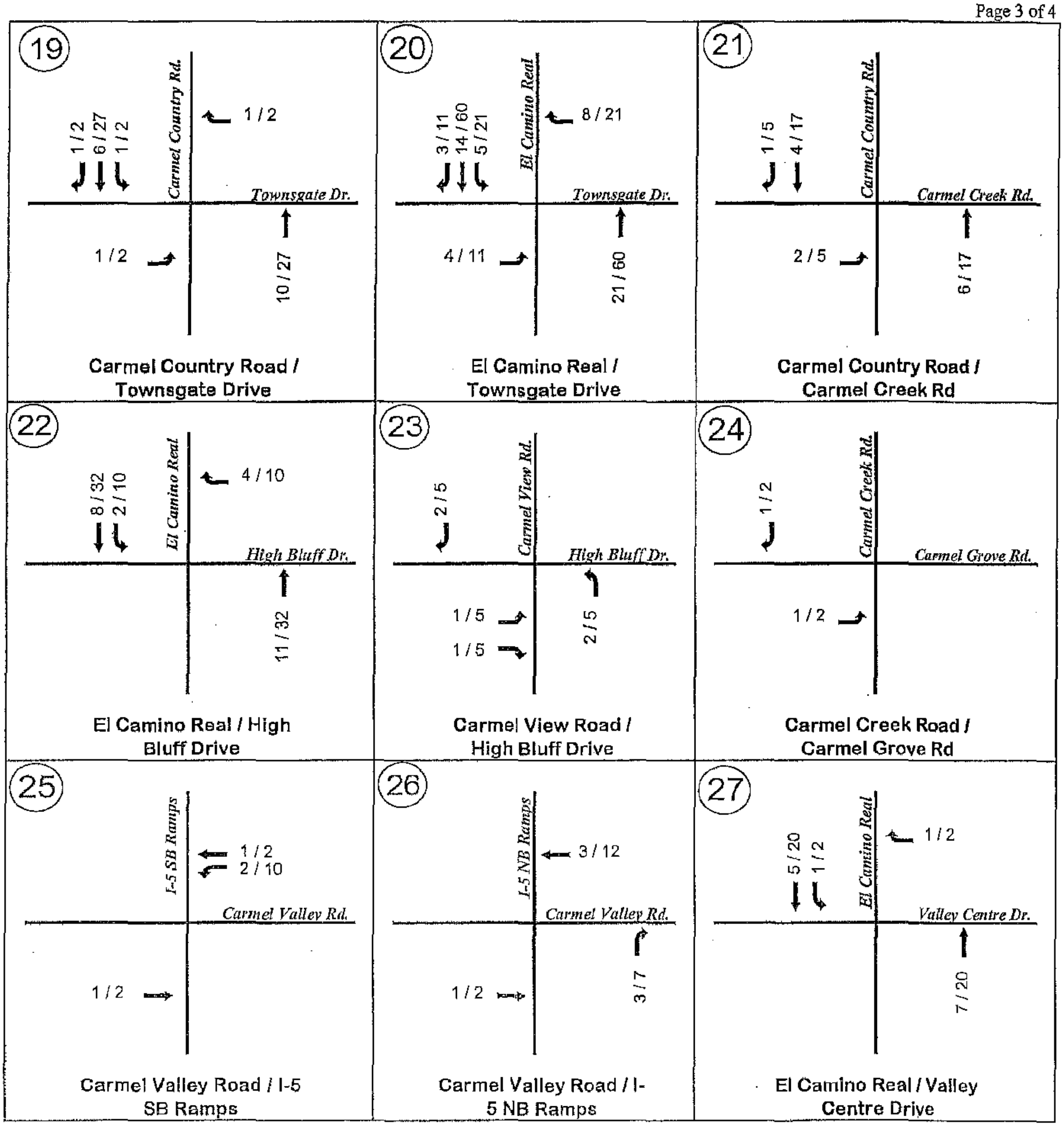
ATTACHMENT 3

Project Only (DMHTC Expansion) AM/PM Peak Hour Traffic



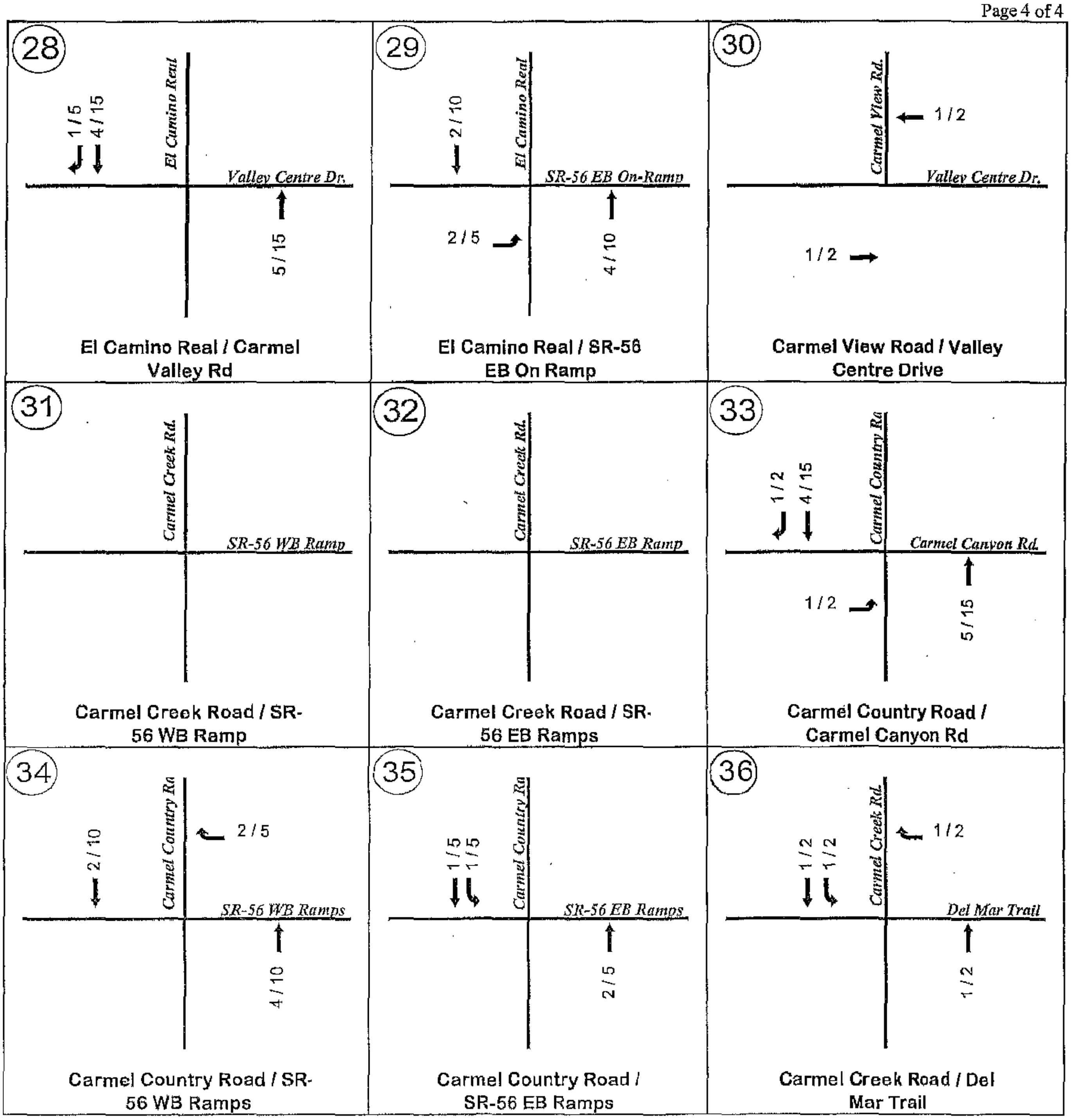
ATTACHMENT 3

Project Only (DMHTC Expansion) AM/PM Peak Hour Traffic



ATTACHMENT 3

Project Only (DMHTC Expansion) AM/PM Peak Hour Traffic



ATTACHMENT 3

Project Only (DMHTC Expansion) AM/PM Peak Hour Traffic

APPENDIX B

INTERSECTION ANALYSIS WORKSHEETS – EXISTING

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	224	1264	0	0	1411	886	373	0	763	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.86	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1458	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1458	1504			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	238	1345	0	0	1501	943	397	0	812	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	447	0	32	32	0	0	0
Lane Group Flow (vph)	238	1345	0	0	1501	496	357	398	390	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	11.2	71.0			54.6	54.6	37.1	37.1	37.1			
Effective Green, g (s)	11.2	71.0			54.6	54.6	37.1	37.1	37.1			
Actuated g/C Ratio	0.09	0.59			0.46	0.46	0.31	0.31	0.31			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	320	2094			2314	720	520	451	465			
v/s Ratio Prot	0.07	c0.38			0.30	c0.31	0.21	c0.27	0.26			
v/s Ratio Perm												
v/c Ratio	0.74	0.64			0.65	0.69	0.69	0.88	0.84			
Uniform Delay, d1	53.0	16.1			25.3	25.9	36.4	39.4	38.6			
Progression Factor	1.00	1.00			0.50	2.65	1.00	1.00	1.00			
Incremental Delay, d2	9.0	1.5			0.8	3.1	3.8	17.9	12.4			
Delay (s)	62.0	17.7			13.5	71.8	40.1	57.3	51.1			
Level of Service	E	B			B	E	D	E	D			
Approach Delay (s)		24.3			36.0			50.0			0.0	
Approach LOS		C			D			D			A	

Intersection Summary			
HCM Average Control Delay	35.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	93.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	108	1179	674	92	1789	59	195	10	13	79	57	303
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5061		3433	3242		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5061		3433	3242		1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	120	1310	749	102	1988	66	217	11	14	88	63	337
RTOR Reduction (vph)	0	0	298	0	2	0	0	12	0	0	0	24
Lane Group Flow (vph)	120	1310	451	102	2052	0	217	13	0	88	63	313
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	14.3	59.0	71.1	9.9	55.0		12.1	17.8		13.6	19.3	33.6
Effective Green, g (s)	14.3	59.0	71.1	9.9	55.0		12.1	17.8		13.6	19.3	33.6
Actuated g/C Ratio	0.12	0.49	0.59	0.08	0.46		0.10	0.15		0.11	0.16	0.28
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	211	2500	938	146	2320		346	481		201	300	443
v/s Ratio Prot	0.07	c0.26	0.05	0.06	c0.41		c0.06	0.00		0.05	0.03	c0.08
v/s Ratio Perm			0.24									0.11
v/c Ratio	0.57	0.52	0.48	0.70	0.88		0.63	0.03		0.44	0.21	0.71
Uniform Delay, d1	49.9	20.9	13.9	53.6	29.6		51.8	43.7		49.6	43.7	38.8
Progression Factor	1.07	0.77	0.64	1.02	0.91		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.5	0.6	0.1	9.8	4.8		2.6	0.0		0.6	0.1	4.2
Delay (s)	54.8	16.7	9.1	64.6	31.8		54.3	43.7		50.2	43.9	42.9
Level of Service	D	B	A	E	C		D	D		D	D	D
Approach Delay (s)		16.2			33.3			53.2			44.3	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM Average Control Delay	28.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.4
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
11: Del Mar Heights Road & Third Ave.

Existing AM
11/23/2015

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1774	0	0	2175	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			5.0		
Lane Util. Factor	0.91			0.91		
Frt	1.00			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	5085			5085		
Flt Permitted	1.00			1.00		
Satd. Flow (perm)	5085			5085		
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1971	0	0	2417	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1971	0	0	2417	0	0
Turn Type		Perm	Prot			Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	106.6			105.6		
Effective Green, g (s)	106.6			105.6		
Actuated g/C Ratio	0.89			0.88		
Clearance Time (s)	4.0			5.0		
Vehicle Extension (s)	3.0			3.0		
Lane Grp Cap (vph)	4517			4475		
v/s Ratio Prot	0.39			c0.48		
v/s Ratio Perm						
v/c Ratio	0.44			0.54		
Uniform Delay, d1	1.2			1.6		
Progression Factor	1.08			1.80		
Incremental Delay, d2	0.3			0.3		
Delay (s)	1.6			3.3		
Level of Service	A			A		
Approach Delay (s)	1.6			3.3	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	2.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.4
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
18: Del Mar Highlands Town Ctr. & El Camino Real

Existing AM
11/23/2015

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	0	0	94	0	107	0	308	98	160	661	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor					1.00	1.00		0.91		0.97	0.91	
Frt					1.00	0.85		0.96		1.00	1.00	
Flt Protected					0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)					1770	1583		4901		3433	5085	
Flt Permitted					0.95	1.00		1.00		0.95	1.00	
Satd. Flow (perm)					1770	1583		4901		3433	5085	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	104	0	119	0	342	109	178	734	0
RTOR Reduction (vph)	0	0	0	0	0	94	0	43	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	104	25	0	408	0	178	734	0
Turn Type	Split			Split		Perm	Prot			Prot		
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						
Actuated Green, G (s)					8.5	8.5		13.1		6.1	23.2	
Effective Green, g (s)					8.5	8.5		13.1		6.1	23.2	
Actuated g/C Ratio					0.21	0.21		0.33		0.15	0.58	
Clearance Time (s)					4.0	4.0		4.0		4.0	4.0	
Vehicle Extension (s)					3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)					379	339		1617		527	2972	
v/s Ratio Prot					c0.06			0.08		c0.05	c0.14	
v/s Ratio Perm						0.02						
v/c Ratio					0.27	0.08		0.25		0.34	0.25	
Uniform Delay, d1					13.0	12.5		9.7		15.0	4.0	
Progression Factor					1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2					0.4	0.1		0.1		0.4	0.0	
Delay (s)					13.4	12.6		9.8		15.4	4.1	
Level of Service					B	B		A		B	A	
Approach Delay (s)		0.0			13.0			9.8			6.3	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM Average Control Delay	8.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	39.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	31.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	235	1463	0	0	1017	796	615	10	749	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	15	12	12	13	12	12	12
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			*0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.90	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	3433	3539			5085	1742	1681	1500	1554			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	3433	3539			5085	1742	1681	1500	1554			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	247	1540	0	0	1071	838	647	11	788	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	470	0	15	15	0	0	0
Lane Group Flow (vph)	247	1540	0	0	1071	368	505	461	450	0	0	0
Turn Type	Prot					Perm	Split		Prot			
Protected Phases	5	2			6		8	8	8			
Permitted Phases						6						
Actuated Green, G (s)	8.6	66.5			52.7	52.7	41.6	41.6	41.6			
Effective Green, g (s)	8.6	66.5			52.7	52.7	41.6	41.6	41.6			
Actuated g/C Ratio	0.07	0.55			0.44	0.44	0.35	0.35	0.35			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	246	1961			2233	765	583	520	539			
v/s Ratio Prot	0.07	c0.44			0.21		0.30	c0.31	0.29			
v/s Ratio Perm						0.21						
v/c Ratio	1.00	0.79			0.48	0.48	0.87	0.89	0.83			
Uniform Delay, d1	55.7	21.1			23.9	23.9	36.6	37.0	36.0			
Progression Factor	1.00	1.00			0.47	3.83	1.00	1.00	1.00			
Incremental Delay, d2	58.4	3.2			0.2	0.5	12.8	16.5	10.7			
Delay (s)	114.1	24.4			11.5	92.1	49.4	53.5	46.8			
Level of Service	F	C			B	F	D	D	D			
Approach Delay (s)		36.8			46.9			49.9			0.0	
Approach LOS		D			D			D			A	

Intersection Summary			
HCM Average Control Delay	44.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	95.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	242	1984	251	15	1140	28	618	65	134	27	29	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5067		3433	3181		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5067		3433	3181		1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	269	2204	279	17	1267	31	687	72	149	30	32	89
RTOR Reduction (vph)	0	0	70	0	2	0	0	115	0	0	0	2
Lane Group Flow (vph)	269	2204	209	17	1296	0	687	106	0	30	32	87
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	27.2	67.5	82.1	1.6	42.3		14.6	27.4		3.8	16.6	43.8
Effective Green, g (s)	27.2	67.5	82.1	1.6	42.3		14.6	27.4		3.8	16.6	43.8
Actuated g/C Ratio	0.23	0.56	0.68	0.01	0.35		0.12	0.23		0.03	0.14	0.36
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	401	2860	1083	24	1786		418	726		56	258	578
v/s Ratio Prot	c0.15	c0.43	0.02	0.01	0.26		c0.20	c0.03		0.02	0.02	0.03
v/s Ratio Perm			0.11									0.02
v/c Ratio	0.67	0.77	0.19	0.71	0.73		1.64	0.15		0.54	0.12	0.15
Uniform Delay, d1	42.3	20.3	6.9	59.0	33.8		52.7	37.0		57.2	45.3	25.6
Progression Factor	1.03	1.15	1.03	1.16	1.29		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.5	1.5	0.0	54.2	2.5		300.2	0.0		4.9	0.1	0.0
Delay (s)	46.3	24.8	7.1	122.3	46.1		352.9	37.0		62.1	45.4	25.6
Level of Service	D	C	A	F	D		F	D		E	D	C
Approach Delay (s)		25.1			47.1			276.0			37.1	
Approach LOS		C			D			F			D	

Intersection Summary			
HCM Average Control Delay	75.5	HCM Level of Service	E
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.8
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

11: Del Mar Heights Road & Third Ave.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2404	0	0	1478	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			5.0		
Lane Util. Factor	0.91			0.91		
Frt	1.00			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	5085			5085		
Flt Permitted	1.00			1.00		
Satd. Flow (perm)	5085			5085		
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2671	0	0	1642	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	2671	0	0	1642	0	0
Turn Type		Perm	Prot			Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	106.6			105.6		
Effective Green, g (s)	106.6			105.6		
Actuated g/C Ratio	0.89			0.88		
Clearance Time (s)	4.0			5.0		
Vehicle Extension (s)	3.0			3.0		
Lane Grp Cap (vph)	4517			4475		
v/s Ratio Prot	c0.53			0.32		
v/s Ratio Perm						
v/c Ratio	0.59			0.37		
Uniform Delay, d1	1.6			1.3		
Progression Factor	1.36			0.72		
Incremental Delay, d2	0.5			0.2		
Delay (s)	2.6			1.1		
Level of Service	A			A		
Approach Delay (s)	2.6			1.1	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	2.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

18: Del Mar Highlands Town Ctr. & El Camino Real

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	0	0	0	188	0	248	0	631	163	286	378	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor					1.00	1.00		0.91		0.97	0.91	
Frt					1.00	0.85		0.97		1.00	0.99	
Flt Protected					0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)					1770	1583		4929		3433	5030	
Flt Permitted					0.95	1.00		1.00		0.95	1.00	
Satd. Flow (perm)					1770	1583		4929		3433	5030	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	209	0	276	0	701	181	318	420	33
RTOR Reduction (vph)	0	0	0	0	0	202	0	34	0	0	4	0
Lane Group Flow (vph)	0	0	0	0	209	74	0	848	0	318	449	0
Turn Type	Split			Split		Perm	Prot			Prot		
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						
Actuated Green, G (s)					15.5	15.5		18.7		11.9	34.6	
Effective Green, g (s)					15.5	15.5		18.7		11.9	34.6	
Actuated g/C Ratio					0.27	0.27		0.32		0.20	0.60	
Clearance Time (s)					4.0	4.0		4.0		4.0	4.0	
Vehicle Extension (s)					3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)					472	422		1586		703	2995	
v/s Ratio Prot					c0.12			c0.17		c0.09	0.09	
v/s Ratio Perm						0.05						
v/c Ratio					0.44	0.17		0.53		0.45	0.15	
Uniform Delay, d1					17.7	16.4		16.1		20.2	5.2	
Progression Factor					1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2					0.7	0.2		0.3		0.5	0.0	
Delay (s)					18.4	16.6		16.5		20.7	5.2	
Level of Service					B	B		B		C	A	
Approach Delay (s)		0.0			17.4			16.5			11.6	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM Average Control Delay	14.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	58.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX C

INTERSECTION ANALYSIS WORKSHEETS
– EXISTING + PROJECT

9: Del Mar Heights Road & I-5 NB Ramps

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	224	1392	0	0	1519	918	373	0	873	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.86	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1456	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1456	1504			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	238	1481	0	0	1616	977	397	0	929	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	444	0	22	22	0	0	0
Lane Group Flow (vph)	238	1481	0	0	1616	533	357	464	461	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	11.0	68.7			52.5	52.5	39.4	39.4	39.4			
Effective Green, g (s)	11.0	68.7			52.5	52.5	39.4	39.4	39.4			
Actuated g/C Ratio	0.09	0.57			0.44	0.44	0.33	0.33	0.33			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	315	2026			2225	693	552	478	494			
v/s Ratio Prot	0.07	c0.42			0.32	c0.34	0.21	c0.32	0.31			
v/s Ratio Perm												
v/c Ratio	0.76	0.73			0.73	0.77	0.65	0.97	0.93			
Uniform Delay, d1	53.2	18.9			27.8	28.6	34.4	39.7	39.0			
Progression Factor	1.00	1.00			0.46	2.18	1.00	1.00	1.00			
Incremental Delay, d2	9.9	2.4			1.0	4.0	2.6	33.5	24.7			
Delay (s)	63.1	21.2			13.9	66.4	37.0	73.2	63.7			
Level of Service	E	C			B	E	D	E	E			
Approach Delay (s)		27.0			33.7			60.0			0.0	
Approach LOS		C			C			E			A	

Intersection Summary			
HCM Average Control Delay	37.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	96.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

10: Del Mar Heights Road & High Bluff Drive

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	108	1417	674	96	1929	77	195	10	19	110	57	303
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5056		3433	3191		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5056		3433	3191		1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	120	1574	749	107	2143	86	217	11	21	122	63	337
RTOR Reduction (vph)	0	0	297	0	3	0	0	18	0	0	0	25
Lane Group Flow (vph)	120	1574	452	107	2226	0	217	14	0	122	63	312
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	14.3	58.9	71.0	10.1	55.1		12.1	16.4		14.9	19.2	33.5
Effective Green, g (s)	14.3	58.9	71.0	10.1	55.1		12.1	16.4		14.9	19.2	33.5
Actuated g/C Ratio	0.12	0.49	0.59	0.08	0.46		0.10	0.14		0.12	0.16	0.28
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	211	2496	937	149	2322		346	436		220	298	442
v/s Ratio Prot	0.07	c0.31	0.05	0.06	c0.44		0.06	0.00		c0.07	0.03	c0.08
v/s Ratio Perm			0.24									0.11
v/c Ratio	0.57	0.63	0.48	0.72	0.96		0.63	0.03		0.55	0.21	0.71
Uniform Delay, d1	49.9	22.5	14.0	53.6	31.4		51.8	44.9		49.4	43.8	38.8
Progression Factor	1.06	0.82	0.69	1.07	0.79		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.2	0.7	0.1	11.3	10.2		2.6	0.0		1.7	0.1	4.2
Delay (s)	54.3	19.2	9.7	68.9	34.9		54.3	44.9		51.1	43.9	43.0
Level of Service	D	B	A	E	C		D	D		D	D	D
Approach Delay (s)		18.0			36.5			53.1			45.0	
Approach LOS		B			D			D			D	

Intersection Summary			
HCM Average Control Delay	29.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1449	142	206	1991	141	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	1770	5085	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	1770	5085	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1610	158	229	2212	157	48
RTOR Reduction (vph)	0	52	0	0	0	43
Lane Group Flow (vph)	1610	106	229	2212	157	5
Turn Type		Perm	Prot			Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	73.0	73.0	21.5	97.5	13.5	13.5
Effective Green, g (s)	73.0	73.0	21.5	97.5	13.5	13.5
Actuated g/C Ratio	0.61	0.61	0.18	0.81	0.11	0.11
Clearance Time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3093	963	317	4132	386	178
v/s Ratio Prot	0.32		c0.13	c0.43	c0.05	
v/s Ratio Perm		0.07				0.00
v/c Ratio	0.52	0.11	0.72	0.54	0.41	0.03
Uniform Delay, d1	13.5	9.9	46.4	3.7	49.5	47.4
Progression Factor	1.46	2.35	0.98	1.65	1.00	1.00
Incremental Delay, d2	0.5	0.2	5.6	0.3	0.7	0.1
Delay (s)	20.1	23.4	51.1	6.5	50.2	47.5
Level of Service	C	C	D	A	D	D
Approach Delay (s)	20.4			10.7	49.6	
Approach LOS	C			B	D	

Intersection Summary			
HCM Average Control Delay	16.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	13	13	94	21	107	107	292	98	160	640	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95			1.00	1.00	0.97	0.91		0.97	0.91	
Frt	1.00	0.97			1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1664			1789	1583	3433	4893		3433	5045	
Flt Permitted	0.95	0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1664			1789	1583	3433	4893		3433	5045	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	94	14	14	104	23	119	119	324	109	178	711	40
RTOR Reduction (vph)	0	9	0	0	0	94	0	50	0	0	5	0
Lane Group Flow (vph)	61	52	0	0	127	25	119	383	0	178	746	0
Turn Type	Split			Split		Perm	Prot			Prot		
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						
Actuated Green, G (s)	6.5	6.5			12.8	12.8	6.3	16.1		9.6	19.4	
Effective Green, g (s)	6.5	6.5			12.8	12.8	6.3	16.1		9.6	19.4	
Actuated g/C Ratio	0.11	0.11			0.21	0.21	0.10	0.26		0.16	0.32	
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	179	177			375	332	355	1291		540	1604	
v/s Ratio Prot	c0.04	0.03			c0.07		0.03	0.08		c0.05	c0.15	
v/s Ratio Perm						0.02						
v/c Ratio	0.34	0.29			0.34	0.08	0.34	0.30		0.33	0.47	
Uniform Delay, d1	25.3	25.1			20.5	19.3	25.4	17.9		22.8	16.6	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.9			0.5	0.1	0.6	0.1		0.4	0.2	
Delay (s)	26.4	26.1			21.0	19.4	26.0	18.1		23.2	16.9	
Level of Service	C	C			C	B	C	B		C	B	
Approach Delay (s)		26.2			20.3			19.8			18.1	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	61.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	235	1608	0	0	1274	873	615	10	873	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	15	12	12	13	12	12	12
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			*0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.88	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	3433	3539			5085	1742	1681	1480	1554			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	3433	3539			5085	1742	1681	1480	1554			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	247	1693	0	0	1341	919	647	11	919	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	505	0	10	10	0	0	0
Lane Group Flow (vph)	247	1693	0	0	1341	414	550	512	495	0	0	0
Turn Type	Prot					Perm	Split		Prot			
Protected Phases	5	2			6		8	8	8			
Permitted Phases						6						
Actuated Green, G (s)	6.8	64.7			52.7	52.7	43.4	43.4	43.4			
Effective Green, g (s)	6.8	64.7			52.7	52.7	43.4	43.4	43.4			
Actuated g/C Ratio	0.06	0.54			0.44	0.44	0.36	0.36	0.36			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	195	1908			2233	765	608	535	562			
v/s Ratio Prot	c0.07	c0.48			0.26		0.33	c0.35	0.32			
v/s Ratio Perm						0.24						
v/c Ratio	1.27	0.89			0.60	0.54	0.90	0.96	0.88			
Uniform Delay, d1	56.6	24.4			25.6	24.7	36.3	37.4	35.9			
Progression Factor	1.00	1.00			0.43	3.71	1.00	1.00	1.00			
Incremental Delay, d2	154.1	6.6			0.1	0.2	16.9	28.2	15.0			
Delay (s)	210.7	31.0			11.2	92.2	53.3	65.7	50.9			
Level of Service	F	C			B	F	D	E	D			
Approach Delay (s)		53.9			44.2			56.6			0.0	
Approach LOS		D			D			E			A	

Intersection Summary			
HCM Average Control Delay	50.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	101.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	242	2253	251	24	1474	71	618	65	141	62	29	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5050		3433	3175		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5050		3433	3175		1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	269	2503	279	27	1638	79	687	72	157	69	32	89
RTOR Reduction (vph)	0	0	64	0	4	0	0	79	0	0	0	1
Lane Group Flow (vph)	269	2503	215	27	1713	0	687	150	0	69	32	88
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	27.2	66.0	80.8	2.9	42.1		14.8	26.5		4.9	16.6	43.8
Effective Green, g (s)	27.2	66.0	80.8	2.9	42.1		14.8	26.5		4.9	16.6	43.8
Actuated g/C Ratio	0.23	0.55	0.67	0.02	0.35		0.12	0.22		0.04	0.14	0.36
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	401	2797	1066	43	1772		423	701		72	258	578
v/s Ratio Prot	c0.15	c0.49	0.02	0.02	c0.34		c0.20	c0.05		0.04	0.02	0.03
v/s Ratio Perm			0.11									0.02
v/c Ratio	0.67	0.89	0.20	0.63	0.97		1.62	0.21		0.96	0.12	0.15
Uniform Delay, d1	42.3	23.9	7.4	58.0	38.3		52.6	38.2		57.4	45.3	25.6
Progression Factor	1.01	1.15	1.11	1.15	1.18		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.1	3.2	0.0	17.6	14.1		291.5	0.1		90.1	0.1	0.0
Delay (s)	44.9	30.8	8.2	84.4	59.3		344.1	38.3		147.6	45.4	25.7
Level of Service	D	C	A	F	E		F	D		F	D	C
Approach Delay (s)		30.0			59.7			267.7			73.3	
Approach LOS		C			E			F			E	

Intersection Summary			
HCM Average Control Delay	77.0	HCM Level of Service	E
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.4
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2378	186	270	1315	362	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	1770	5085	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	1770	5085	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2642	207	300	1461	402	122
RTOR Reduction (vph)	0	58	0	0	0	102
Lane Group Flow (vph)	2642	149	300	1461	402	20
Turn Type		Perm	Prot			Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	71.0	71.0	17.1	91.1	19.9	19.9
Effective Green, g (s)	71.0	71.0	17.1	91.1	19.9	19.9
Actuated g/C Ratio	0.59	0.59	0.14	0.76	0.17	0.17
Clearance Time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3009	937	252	3860	569	263
v/s Ratio Prot	c0.52		c0.17	0.29	c0.12	
v/s Ratio Perm		0.09				0.01
v/c Ratio	0.88	0.16	1.19	0.38	0.71	0.08
Uniform Delay, d1	20.8	11.0	51.5	4.9	47.3	42.3
Progression Factor	0.89	0.59	0.74	1.40	1.00	1.00
Incremental Delay, d2	2.5	0.2	116.8	0.3	4.0	0.1
Delay (s)	21.0	6.7	155.1	7.1	51.3	42.4
Level of Service	C	A	F	A	D	D
Approach Delay (s)	19.9			32.3	49.2	
Approach LOS	B			C	D	

Intersection Summary			
HCM Average Control Delay	27.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	219	33	33	188	28	248	140	619	163	286	420	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95			1.00	1.00	0.97	0.91		0.97	0.91	
Frt	1.00	0.96			1.00	0.85	1.00	0.97		1.00	0.98	
Flt Protected	0.95	0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1663			1785	1583	3433	4926		3433	5009	
Flt Permitted	0.95	0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1663			1785	1583	3433	4926		3433	5009	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	243	37	37	209	31	276	156	688	181	318	467	52
RTOR Reduction (vph)	0	9	0	0	0	214	0	39	0	0	10	0
Lane Group Flow (vph)	160	148	0	0	240	62	156	830	0	318	509	0
Turn Type	Split			Split		Perm	Prot			Prot		
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						
Actuated Green, G (s)	13.6	13.6			18.7	18.7	9.8	21.7		13.8	25.7	
Effective Green, g (s)	13.6	13.6			18.7	18.7	9.8	21.7		13.8	25.7	
Actuated g/C Ratio	0.16	0.16			0.22	0.22	0.12	0.26		0.16	0.31	
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	273	270			398	353	401	1276		565	1536	
v/s Ratio Prot	c0.10	0.09			c0.13		0.05	c0.17		c0.09	c0.10	
v/s Ratio Perm						0.04						
v/c Ratio	0.59	0.55			0.60	0.17	0.39	0.65		0.56	0.33	
Uniform Delay, d1	32.5	32.3			29.2	26.3	34.2	27.7		32.2	22.4	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.2	2.3			2.6	0.2	0.6	1.2		1.3	0.1	
Delay (s)	35.7	34.5			31.8	26.5	34.9	28.9		33.5	22.5	
Level of Service	D	C			C	C	C	C		C	C	
Approach Delay (s)		35.1			29.0			29.8			26.7	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM Average Control Delay	29.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	83.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	52.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX D

INTERSECTION ANALYSIS WORKSHEETS – NEAR-TERM WITHOUT PROJECT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	231	1313	0	0	1479	922	384	59	923	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.88	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1484	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1484	1504			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	246	1397	0	0	1573	981	409	63	982	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	437	0	18	18	0	0	0
Lane Group Flow (vph)	246	1397	0	0	1573	544	368	528	522	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	10.1	63.3			48.0	48.0	44.8	44.8	44.8			
Effective Green, g (s)	10.1	63.3			48.0	48.0	44.8	44.8	44.8			
Actuated g/C Ratio	0.08	0.53			0.40	0.40	0.37	0.37	0.37			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	289	1867			2034	633	628	554	561			
v/s Ratio Prot	0.07	c0.39			0.31	c0.34	0.22	c0.36	0.35			
v/s Ratio Perm												
v/c Ratio	0.85	0.75			0.77	0.86	0.59	0.95	0.93			
Uniform Delay, d1	54.2	22.1			31.3	32.9	30.2	36.6	36.1			
Progression Factor	1.00	1.00			0.54	1.85	1.00	1.00	1.00			
Incremental Delay, d2	20.7	2.8			1.5	7.8	1.4	26.7	22.2			
Delay (s)	74.9	24.9			18.4	68.8	31.6	63.3	58.3			
Level of Service	E	C			B	E	C	E	E			
Approach Delay (s)		32.4			37.7			53.4			0.0	
Approach LOS		C			D			D			A	

Intersection Summary			
HCM Average Control Delay	40.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	99.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	111	1421	694	96	1878	62	201	10	15	82	59	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.91		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5061		3433	3217		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5061		3433	3217		1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	123	1579	771	107	2087	69	223	11	17	91	66	347
RTOR Reduction (vph)	0	0	297	0	2	0	0	14	0	0	0	27
Lane Group Flow (vph)	123	1579	474	107	2154	0	223	14	0	91	66	320
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	14.6	58.1	70.7	10.3	54.2		12.6	18.1		13.8	19.3	33.9
Effective Green, g (s)	14.6	58.1	70.7	10.3	54.2		12.6	18.1		13.8	19.3	33.9
Actuated g/C Ratio	0.12	0.48	0.59	0.09	0.45		0.10	0.15		0.12	0.16	0.28
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	215	2462	933	152	2286		360	485		204	300	447
v/s Ratio Prot	0.07	c0.31	0.05	0.06	c0.43		c0.06	0.00		0.05	0.04	c0.09
v/s Ratio Perm			0.25									0.12
v/c Ratio	0.57	0.64	0.51	0.70	0.94		0.62	0.03		0.45	0.22	0.72
Uniform Delay, d1	49.8	23.2	14.4	53.4	31.4		51.4	43.4		49.5	43.8	38.7
Progression Factor	1.06	0.86	0.63	1.09	0.90		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.3	0.8	0.1	10.3	8.7		2.2	0.0		0.6	0.1	4.5
Delay (s)	53.9	20.7	9.1	68.4	37.0		53.6	43.5		50.1	43.9	43.3
Level of Service	D	C	A	E	D		D	D		D	D	D
Approach Delay (s)		18.8			38.5			52.5			44.6	
Approach LOS		B			D			D			D	

Intersection Summary			
HCM Average Control Delay	30.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.4
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1496	0	0	2019	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			5.0		
Lane Util. Factor	0.91			0.91		
Frt	1.00			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	5085			5085		
Flt Permitted	1.00			1.00		
Satd. Flow (perm)	5085			5085		
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1662	0	0	2243	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1662	0	0	2243	0	0
Turn Type		Perm	Prot			Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	106.6			105.6		
Effective Green, g (s)	106.6			105.6		
Actuated g/C Ratio	0.89			0.88		
Clearance Time (s)	4.0			5.0		
Vehicle Extension (s)	3.0			3.0		
Lane Grp Cap (vph)	4517			4475		
v/s Ratio Prot	0.33			c0.44		
v/s Ratio Perm						
v/c Ratio	0.37			0.50		
Uniform Delay, d1	1.1			1.5		
Progression Factor	0.87			1.64		
Incremental Delay, d2	0.2			0.3		
Delay (s)	1.1			2.9		
Level of Service	A			A		
Approach Delay (s)	1.1			2.9	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	2.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.4
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	119	0	131	0	325	134	197	815	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor				1.00		1.00		0.91		0.97	0.91	
Frt				1.00		0.85		0.96		1.00	1.00	
Flt Protected				0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)				1770		1583		4862		3433	5085	
Flt Permitted				0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)				1770		1583		4862		3433	5085	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	132	0	146	0	361	149	219	906	0
RTOR Reduction (vph)	0	0	0	0	0	106	0	55	0	0	0	0
Lane Group Flow (vph)	0	0	0	132	0	40	0	455	0	219	906	0
Turn Type	Split			custom		custom	Prot			Prot		
Protected Phases	2	2					3	8		7	4	
Permitted Phases				6		6						
Actuated Green, G (s)				12.7		12.7		12.2		9.3	25.5	
Effective Green, g (s)				12.7		12.7		12.2		9.3	25.5	
Actuated g/C Ratio				0.27		0.27		0.26		0.20	0.55	
Clearance Time (s)				4.0		4.0		4.0		4.0	4.0	
Vehicle Extension (s)				3.0		3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)				487		435		1284		691	2807	
v/s Ratio Prot								0.09		0.06	c0.18	
v/s Ratio Perm				c0.07		0.03						
v/c Ratio				0.27		0.09		0.35		0.32	0.32	
Uniform Delay, d1				13.1		12.5		13.8		15.7	5.6	
Progression Factor				1.00		1.00		1.00		1.00	1.00	
Incremental Delay, d2				0.3		0.1		0.2		0.3	0.1	
Delay (s)				13.4		12.6		14.0		16.0	5.7	
Level of Service				B		B		B		B	A	
Approach Delay (s)		0.0			13.0			14.0			7.7	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM Average Control Delay	10.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	46.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
9: Del Mar Heights Road & I-5 NB Ramps

Near-Term PM
11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	242	1546	0	0	1233	902	649	24	827	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.90	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1499	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1499	1504			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	255	1627	0	0	1298	949	683	25	871	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	500	0	9	9	0	0	0
Lane Group Flow (vph)	255	1627	0	0	1298	449	546	519	496	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	10.8	62.7			46.7	46.7	45.4	45.4	45.4			
Effective Green, g (s)	10.8	62.7			46.7	46.7	45.4	45.4	45.4			
Actuated g/C Ratio	0.09	0.52			0.39	0.39	0.38	0.38	0.38			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	309	1849			1979	616	636	567	569			
v/s Ratio Prot	0.07	c0.46			0.26	0.28	0.32	c0.35	0.33			
v/s Ratio Perm												
v/c Ratio	0.83	0.88			0.66	0.73	0.86	0.92	0.87			
Uniform Delay, d1	53.7	25.3			30.1	31.2	34.3	35.5	34.6			
Progression Factor	1.00	1.00			0.87	2.94	1.00	1.00	1.00			
Incremental Delay, d2	16.2	6.4			0.2	0.7	11.1	19.5	13.8			
Delay (s)	69.9	31.7			26.2	92.5	45.5	55.0	48.4			
Level of Service	E	C			C	F	D	E	D			
Approach Delay (s)		36.9			54.2			49.6			0.0	
Approach LOS		D			D			D			A	

Intersection Summary			
HCM Average Control Delay	47.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	104.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
10: Del Mar Heights Road & High Bluff Drive

Near-Term PM
11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	249	2145	259	20	1409	31	637	67	143	30	30	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5069		3433	3177		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5069		3433	3177		1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	277	2383	288	22	1566	34	708	74	159	33	33	91
RTOR Reduction (vph)	0	0	69	0	2	0	0	123	0	0	0	1
Lane Group Flow (vph)	277	2383	219	22	1598	0	708	110	0	33	33	90
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	28.2	65.8	80.4	3.3	41.3		14.6	27.4		3.8	16.6	44.8
Effective Green, g (s)	28.2	65.8	80.4	3.3	41.3		14.6	27.4		3.8	16.6	44.8
Actuated g/C Ratio	0.23	0.55	0.67	0.03	0.34		0.12	0.23		0.03	0.14	0.37
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	416	2788	1061	49	1745		418	725		56	258	591
v/s Ratio Prot	c0.16	c0.47	0.03	0.01	c0.32		c0.21	c0.03		0.02	0.02	0.04
v/s Ratio Perm			0.11									0.02
v/c Ratio	0.67	0.85	0.21	0.45	0.92		1.69	0.15		0.59	0.13	0.15
Uniform Delay, d1	41.6	23.0	7.6	57.5	37.7		52.7	37.0		57.3	45.4	25.0
Progression Factor	1.01	1.07	0.85	1.10	1.43		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.0	2.4	0.0	2.3	8.8		322.4	0.0		9.8	0.1	0.0
Delay (s)	44.2	27.0	6.5	65.8	62.9		375.1	37.0		67.1	45.4	25.0
Level of Service	D	C	A	E	E		F	D		E	D	C
Approach Delay (s)		26.6			62.9			291.4			38.2	
Approach LOS		C			E			F			D	

Intersection Summary			
HCM Average Control Delay	81.3	HCM Level of Service	F
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.4
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

11: Del Mar Heights Road & Third Ave.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2254	0	0	1397	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			5.0		
Lane Util. Factor	0.91			0.91		
Frt	1.00			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	5085			5085		
Flt Permitted	1.00			1.00		
Satd. Flow (perm)	5085			5085		
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2504	0	0	1552	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	2504	0	0	1552	0	0
Turn Type		Perm	Prot			Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	106.6			105.6		
Effective Green, g (s)	106.6			105.6		
Actuated g/C Ratio	0.89			0.88		
Clearance Time (s)	4.0			5.0		
Vehicle Extension (s)	3.0			3.0		
Lane Grp Cap (vph)	4517			4475		
v/s Ratio Prot	c0.49			0.31		
v/s Ratio Perm						
v/c Ratio	0.55			0.35		
Uniform Delay, d1	1.5			1.2		
Progression Factor	1.57			0.33		
Incremental Delay, d2	0.3			0.2		
Delay (s)	2.6			0.6		
Level of Service	A			A		
Approach Delay (s)	2.6			0.6	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	1.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	46.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

18: Del Mar Highlands Town Ctr. & El Camino Real

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	285	0	343	0	844	259	383	380	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				4.0		4.0		4.0		4.0	4.0	
Lane Util. Factor				1.00		1.00		0.91		0.97	0.91	
Frt				1.00		0.85		0.96		1.00	1.00	
Flt Protected				0.95		1.00		1.00		0.95	1.00	
Satd. Flow (prot)				1770		1583		4906		3433	5085	
Flt Permitted				0.95		1.00		1.00		0.95	1.00	
Satd. Flow (perm)				1770		1583		4906		3433	5085	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	317	0	381	0	938	288	426	422	0
RTOR Reduction (vph)	0	0	0	0	0	278	0	40	0	0	0	0
Lane Group Flow (vph)	0	0	0	317	0	103	0	1186	0	426	422	0
Turn Type	Split			Prot		custom	Prot			Prot		
Protected Phases	2	2		6			3	8		7	4	
Permitted Phases						6						
Actuated Green, G (s)				20.7		20.7		28.2		15.8	48.0	
Effective Green, g (s)				20.7		20.7		28.2		15.8	48.0	
Actuated g/C Ratio				0.27		0.27		0.37		0.21	0.63	
Clearance Time (s)				4.0		4.0		4.0		4.0	4.0	
Vehicle Extension (s)				3.0		3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)				478		427		1804		707	3182	
v/s Ratio Prot				c0.18				c0.24		c0.12	0.08	
v/s Ratio Perm						0.06						
v/c Ratio				0.66		0.24		0.66		0.60	0.13	
Uniform Delay, d1				24.9		21.9		20.2		27.6	5.9	
Progression Factor				1.00		1.00		1.00		1.00	1.00	
Incremental Delay, d2				3.5		0.3		0.9		1.5	0.0	
Delay (s)				28.4		22.2		21.1		29.1	5.9	
Level of Service				C		C		C		C	A	
Approach Delay (s)		0.0			25.0			21.1			17.5	
Approach LOS		A			C			C			B	

Intersection Summary			
HCM Average Control Delay	21.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	76.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX E

INTERSECTION ANALYSIS WORKSHEETS
– NEAR-TERM WITH PROJECT

9: Del Mar Heights Road & I-5 NB Ramps

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	231	1441	0	0	1587	954	384	59	1033	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.88	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1479	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1479	1504			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	246	1533	0	0	1688	1015	409	63	1099	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	439	0	12	12	0	0	0
Lane Group Flow (vph)	246	1533	0	0	1688	576	368	598	581	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	9.8	62.7			47.7	47.7	45.4	45.4	45.4			
Effective Green, g (s)	9.8	62.7			47.7	47.7	45.4	45.4	45.4			
Actuated g/C Ratio	0.08	0.52			0.40	0.40	0.38	0.38	0.38			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	280	1849			2021	629	636	560	569			
v/s Ratio Prot	0.07	c0.43			0.33	c0.36	0.22	c0.40	0.39			
v/s Ratio Perm												
v/c Ratio	0.88	0.83			0.84	0.92	0.58	1.07	1.02			
Uniform Delay, d1	54.5	24.1			32.6	34.2	29.7	37.3	37.3			
Progression Factor	1.00	1.00			0.50	1.72	1.00	1.00	1.00			
Incremental Delay, d2	25.2	4.5			1.8	9.9	1.3	57.2	43.0			
Delay (s)	79.7	28.6			18.1	68.7	31.0	94.5	80.3			
Level of Service	E	C			B	E	C	F	F			
Approach Delay (s)		35.7			37.1			74.2			0.0	
Approach LOS		D			D			E			A	

Intersection Summary			
HCM Average Control Delay	46.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	102.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

10: Del Mar Heights Road & High Bluff Drive

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	111	1659	694	100	2018	80	201	10	21	113	59	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5056		3433	3180		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5056		3433	3180		1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	123	1843	771	111	2242	89	223	11	23	126	66	347
RTOR Reduction (vph)	0	0	273	0	3	0	0	20	0	0	0	27
Lane Group Flow (vph)	123	1843	498	111	2328	0	223	14	0	126	66	320
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	14.6	57.9	70.5	10.5	54.2		12.6	16.6		15.3	19.3	33.9
Effective Green, g (s)	14.6	57.9	70.5	10.5	54.2		12.6	16.6		15.3	19.3	33.9
Actuated g/C Ratio	0.12	0.48	0.59	0.09	0.45		0.10	0.14		0.13	0.16	0.28
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	215	2454	930	155	2284		360	440		226	300	447
v/s Ratio Prot	0.07	c0.36	0.06	0.06	c0.46		0.06	0.00		c0.07	0.04	c0.09
v/s Ratio Perm			0.26									0.12
v/c Ratio	0.57	0.75	0.53	0.72	1.02		0.62	0.03		0.56	0.22	0.72
Uniform Delay, d1	49.8	25.2	14.9	53.3	32.9		51.4	44.7		49.2	43.8	38.7
Progression Factor	1.04	0.91	0.63	1.06	0.92		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.0	1.0	0.1	10.7	22.5		2.2	0.0		1.7	0.1	4.5
Delay (s)	52.7	24.0	9.5	67.2	52.7		53.6	44.8		50.9	43.9	43.3
Level of Service	D	C	A	E	D		D	D		D	D	D
Approach Delay (s)		21.2			53.4			52.5			45.1	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	37.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

11: Del Mar Heights Road & Third Ave.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1674	142	206	2070	141	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	1770	5085	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	1770	5085	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1860	158	229	2300	157	48
RTOR Reduction (vph)	0	45	0	0	0	43
Lane Group Flow (vph)	1860	113	229	2300	157	5
Turn Type		Perm	Prot			Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	73.0	73.0	21.5	97.5	13.5	13.5
Effective Green, g (s)	73.0	73.0	21.5	97.5	13.5	13.5
Actuated g/C Ratio	0.61	0.61	0.18	0.81	0.11	0.11
Clearance Time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3093	963	317	4132	386	178
v/s Ratio Prot	c0.37		c0.13	0.45	c0.05	
v/s Ratio Perm		0.07				0.00
v/c Ratio	0.60	0.12	0.72	0.56	0.41	0.03
Uniform Delay, d1	14.5	9.9	46.4	3.9	49.5	47.4
Progression Factor	1.55	2.15	1.00	2.00	1.00	1.00
Incremental Delay, d2	0.6	0.2	5.9	0.4	0.7	0.1
Delay (s)	23.1	21.5	52.5	8.1	50.2	47.5
Level of Service	C	C	D	A	D	D
Approach Delay (s)	23.0			12.1	49.6	
Approach LOS	C			B	D	

Intersection Summary			
HCM Average Control Delay	18.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

18: Del Mar Highlands Town Ctr. & El Camino Real

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	17	13	119	24	131	107	325	134	197	872	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95			1.00	1.00	0.97	0.91		0.97	0.91	
Frt	1.00	0.97			1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	0.98			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1671			1789	1583	3433	4862		3433	5055	
Flt Permitted	0.95	0.98			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1671			1789	1583	3433	4862		3433	5055	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	94	19	14	132	27	146	119	361	149	219	969	40
RTOR Reduction (vph)	0	9	0	0	0	115	0	61	0	0	3	0
Lane Group Flow (vph)	64	54	0	0	159	31	119	449	0	219	1006	0
Turn Type	Split			Split		Perm	Prot			Prot		
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						
Actuated Green, G (s)	6.8	6.8			14.5	14.5	6.4	20.1		11.0	24.7	
Effective Green, g (s)	6.8	6.8			14.5	14.5	6.4	20.1		11.0	24.7	
Actuated g/C Ratio	0.10	0.10			0.21	0.21	0.09	0.29		0.16	0.36	
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	167	166			379	336	321	1429		552	1825	
v/s Ratio Prot	c0.04	0.03			c0.09		0.03	0.09		c0.06	c0.20	
v/s Ratio Perm						0.02						
v/c Ratio	0.38	0.33			0.42	0.09	0.37	0.31		0.40	0.55	
Uniform Delay, d1	28.8	28.7			23.3	21.7	29.1	18.8		25.7	17.4	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	1.1			0.8	0.1	0.7	0.1		0.5	0.4	
Delay (s)	30.3	29.8			24.1	21.8	29.8	18.9		26.2	17.8	
Level of Service	C	C			C	C	C	B		C	B	
Approach Delay (s)		30.1			23.0			21.0			19.3	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	20.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	68.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Near-Term + Proj Buildout PM

9: Del Mar Heights Road & I-5 NB Ramps — 11/24/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	242	1691	0	0	1490	979	649	24	951	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.88	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1481	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1481	1504			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	255	1780	0	0	1568	1031	683	25	1001	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	485	0	6	6	0	0	0
Lane Group Flow (vph)	255	1780	0	0	1568	546	594	558	545	0	0	0
Turn Type	Prot					Perm	Split		Prot			
Protected Phases	5	2			6		8	8	8			
Permitted Phases						6						
Actuated Green, G (s)	10.0	62.0			46.8	46.8	46.1	46.1	46.1			
Effective Green, g (s)	10.0	62.0			46.8	46.8	46.1	46.1	46.1			
Actuated g/C Ratio	0.08	0.52			0.39	0.39	0.38	0.38	0.38			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	286	1828			1983	617	646	569	578			
v/s Ratio Prot	0.07	c0.50			0.31		0.35	c0.38	0.36			
v/s Ratio Perm						0.34						
v/c Ratio	0.89	0.97			0.79	0.89	0.92	0.98	0.94			
Uniform Delay, d1	54.5	28.2			32.3	34.1	35.2	36.5	35.7			
Progression Factor	1.00	1.00			0.65	1.95	1.00	1.00	1.00			
Incremental Delay, d2	27.3	15.7			0.3	1.9	18.2	32.6	24.0			
Delay (s)	81.8	43.9			21.3	68.5	53.3	69.1	59.7			
Level of Service	F	D			C	E	D	E	E			
Approach Delay (s)		48.6			40.0			60.6			0.0	
Approach LOS		D			D			E			A	

Intersection Summary			
HCM Average Control Delay	48.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	110.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Near-Term + Proj Buildout PM

10: Del Mar Heights Road & High Bluff Drive — 11/24/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	249	2414	259	29	1743	74	637	67	150	65	30	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5054		3433	3171		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5054		3433	3171		1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	277	2682	288	32	1937	82	708	74	167	72	33	91
RTOR Reduction (vph)	0	0	62	0	4	0	0	136	0	0	0	0
Lane Group Flow (vph)	277	2682	226	32	2015	0	708	105	0	72	33	91
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	28.4	66.7	80.7	3.0	41.7		14.0	22.6		8.0	16.6	45.0
Effective Green, g (s)	28.4	66.7	80.7	3.0	41.7		14.0	22.6		8.0	16.6	45.0
Actuated g/C Ratio	0.24	0.56	0.67	0.02	0.35		0.12	0.19		0.07	0.14	0.38
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	419	2826	1065	44	1756		401	597		118	258	594
v/s Ratio Prot	c0.16	c0.53	0.02	0.02	c0.40		c0.21	c0.03		0.04	0.02	0.04
v/s Ratio Perm			0.12									0.02
v/c Ratio	0.66	0.95	0.21	0.73	1.15		1.77	0.18		0.61	0.13	0.15
Uniform Delay, d1	41.4	25.1	7.5	58.1	39.1		53.0	40.9		54.5	45.4	24.9
Progression Factor	1.00	1.06	0.90	1.03	1.39		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.6	5.1	0.0	36.5	73.0		354.6	0.1		6.4	0.1	0.0
Delay (s)	43.0	31.7	6.8	96.1	127.2		407.6	40.9		60.9	45.4	24.9
Level of Service	D	C	A	F	F		F	D		E	D	C
Approach Delay (s)		30.5			126.7			314.5			41.6	
Approach LOS		C			F			F			D	

Intersection Summary			
HCM Average Control Delay	103.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.4
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

11: Del Mar Heights Road & Third Ave.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2487	186	270	1529	362	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.91	1.00	0.97	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2763	207	300	1699	402	122
RTOR Reduction (vph)	0	54	0	0	0	102
Lane Group Flow (vph)	2763	153	300	1699	402	20
Turn Type		Perm	Prot			Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	72.3	72.3	15.8	91.1	19.9	19.9
Effective Green, g (s)	72.3	72.3	15.8	91.1	19.9	19.9
Actuated g/C Ratio	0.60	0.60	0.13	0.76	0.17	0.17
Clearance Time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	3064	954	452	3860	569	263
v/s Ratio Prot	c0.54		c0.09	0.33	c0.12	
v/s Ratio Perm		0.10				0.01
v/c Ratio	0.90	0.16	0.66	0.44	0.71	0.08
Uniform Delay, d1	20.8	10.5	49.6	5.2	47.3	42.3
Progression Factor	0.87	0.44	0.87	0.22	1.00	1.00
Incremental Delay, d2	2.7	0.2	3.1	0.3	4.0	0.1
Delay (s)	20.8	4.8	46.4	1.5	51.3	42.4
Level of Service	C	A	D	A	D	D
Approach Delay (s)	19.7			8.2	49.2	
Approach LOS	B			A	D	

Intersection Summary			
HCM Average Control Delay	18.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

18: Del Mar Highlands Town Ctr. & El Camino Real

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	219	44	33	285	39	343	140	844	259	383	482	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95			1.00	1.00	0.97	0.91		0.97	0.91	
Frt	1.00	0.97			1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	0.98			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1670			1784	1583	3433	4906		3433	5018	
Flt Permitted	0.95	0.98			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1670			1784	1583	3433	4906		3433	5018	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	243	49	37	317	43	381	156	938	288	426	536	52
RTOR Reduction (vph)	0	9	0	0	0	223	0	45	0	0	9	0
Lane Group Flow (vph)	165	155	0	0	360	158	156	1181	0	426	579	0
Turn Type	Split			Split		Perm	Prot			Prot		
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						
Actuated Green, G (s)	14.9	14.9			27.4	27.4	10.4	32.1		16.5	38.2	
Effective Green, g (s)	14.9	14.9			27.4	27.4	10.4	32.1		16.5	38.2	
Actuated g/C Ratio	0.14	0.14			0.26	0.26	0.10	0.30		0.15	0.36	
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	234	233			457	406	334	1473		530	1793	
v/s Ratio Prot	c0.10	0.09			c0.20		0.05	c0.24		c0.12	0.12	
v/s Ratio Perm						0.10						
v/c Ratio	0.71	0.67			0.79	0.39	0.47	0.80		0.80	0.32	
Uniform Delay, d1	43.9	43.6			37.0	32.8	45.6	34.5		43.6	25.0	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.3	7.0			8.7	0.6	1.0	3.2		8.6	0.1	
Delay (s)	53.2	50.7			45.8	33.5	46.7	37.7		52.3	25.1	
Level of Service	D	D			D	C	D	D		D	C	
Approach Delay (s)		51.9			39.4			38.7			36.5	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	39.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	106.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX F

INTERSECTION ANALYSIS WORKSHEETS
— 2030 WITHOUT PROJECT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	370	1580	0	0	1850	800	400	60	1110	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.87	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1478	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1478	1504			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	394	1681	0	0	1968	851	426	64	1181	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	264	0	9	9	0	0	0
Lane Group Flow (vph)	394	1681	0	0	1968	588	383	641	629	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	16.4	76.7			55.1	55.1	56.4	56.4	56.4			
Effective Green, g (s)	16.4	76.7			55.1	55.1	56.4	56.4	56.4			
Actuated g/C Ratio	0.11	0.53			0.38	0.38	0.39	0.39	0.39			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	388	1872			1932	602	654	575	585			
v/s Ratio Prot	0.11	c0.47			c0.39	0.37	0.23	c0.43	0.42			
v/s Ratio Perm												
v/c Ratio	1.02	0.90			1.02	0.98	0.59	1.12	1.08			
Uniform Delay, d1	64.3	30.6			45.0	44.3	35.1	44.3	44.3			
Progression Factor	1.00	1.00			0.74	0.45	1.00	1.00	1.00			
Incremental Delay, d2	49.7	7.3			19.5	20.9	1.3	73.4	59.3			
Delay (s)	114.0	37.9			52.9	40.7	36.4	117.7	103.6			
Level of Service	F	D			D	D	D	F	F			
Approach Delay (s)		52.4			49.2			93.7			0.0	
Approach LOS		D			D			F			A	

Intersection Summary			
HCM Average Control Delay	61.5	HCM Level of Service	E
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	1539	840	210	1763	110	290	30	30	120	70	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5041		3433	3274		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5041		3433	3274		1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	133	1710	933	233	1959	122	322	33	33	133	78	444
RTOR Reduction (vph)	0	0	249	0	4	0	0	28	0	0	0	6
Lane Group Flow (vph)	133	1710	684	233	2077	0	322	38	0	133	78	438
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	22.1	64.3	81.2	22.7	65.3		16.9	20.8		17.5	21.4	43.5
Effective Green, g (s)	22.1	64.3	81.2	22.7	65.3		16.9	20.8		17.5	21.4	43.5
Actuated g/C Ratio	0.15	0.44	0.56	0.16	0.45		0.12	0.14		0.12	0.15	0.30
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	270	2255	886	277	2270		400	470		214	275	475
v/s Ratio Prot	0.08	0.34	0.09	0.13	c0.41		c0.09	0.01		0.08	0.04	c0.14
v/s Ratio Perm			0.34									0.14
v/c Ratio	0.49	0.76	0.77	0.84	0.91		0.81	0.08		0.62	0.28	0.92
Uniform Delay, d1	56.3	33.8	24.7	59.4	37.2		62.4	53.8		60.6	55.0	49.1
Progression Factor	1.01	0.86	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.7	1.1	19.3	7.2		10.6	0.0		4.0	0.2	23.0
Delay (s)	56.9	29.7	25.8	78.7	44.4		73.1	53.8		64.6	55.2	72.1
Level of Service	E	C	C	E	D		E	D		E	E	E
Approach Delay (s)		29.7			47.9			69.8			68.6	
Approach LOS		C			D			E			E	

Intersection Summary			
HCM Average Control Delay	43.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1689	0	0	2052	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			5.0		
Lane Util. Factor	0.91			0.91		
Frt	1.00			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	5085			5085		
Flt Permitted	1.00			1.00		
Satd. Flow (perm)	5085			5085		
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1877	0	0	2280	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1877	0	0	2280	0	0
Turn Type		Perm	Prot			Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	106.6			105.6		
Effective Green, g (s)	106.6			105.6		
Actuated g/C Ratio	0.89			0.88		
Clearance Time (s)	4.0			5.0		
Vehicle Extension (s)	3.0			3.0		
Lane Grp Cap (vph)	4517			4475		
v/s Ratio Prot	0.37			c0.45		
v/s Ratio Perm						
v/c Ratio	0.42			0.51		
Uniform Delay, d1	1.2			1.6		
Progression Factor	1.00			2.14		
Incremental Delay, d2	0.3			0.3		
Delay (s)	1.5			3.7		
Level of Service	A			A		
Approach Delay (s)	1.5			3.7	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	2.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.4
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	114	0	130	0	383	101	165	962	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor					1.00	1.00		0.91		0.97	0.91	
Frt					1.00	0.85		0.97		1.00	1.00	
Flt Protected					0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)					1770	1583		4926		3433	5085	
Flt Permitted					0.95	1.00		1.00		0.95	1.00	
Satd. Flow (perm)					1770	1583		4926		3433	5085	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	127	0	144	0	426	112	183	1069	0
RTOR Reduction (vph)	0	0	0	0	0	106	0	41	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	127	38	0	497	0	183	1069	0
Turn Type	Split			Split		Perm	Prot			Prot		
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						
Actuated Green, G (s)					11.7	11.7		12.0		8.7	24.7	
Effective Green, g (s)					11.7	11.7		12.0		8.7	24.7	
Actuated g/C Ratio					0.26	0.26		0.27		0.20	0.56	
Clearance Time (s)					4.0	4.0		4.0		4.0	4.0	
Vehicle Extension (s)					3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)					466	417		1331		673	2829	
v/s Ratio Prot					c0.07			0.10		0.05	c0.21	
v/s Ratio Perm						0.02						
v/c Ratio					0.27	0.09		0.37		0.27	0.38	
Uniform Delay, d1					13.0	12.3		13.1		15.2	5.5	
Progression Factor					1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2					0.3	0.1		0.2		0.2	0.1	
Delay (s)					13.3	12.4		13.3		15.4	5.6	
Level of Service					B	B		B		B	A	
Approach Delay (s)		0.0			12.8			13.3			7.0	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM Average Control Delay	9.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	44.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	38.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	750	1633	0	0	1340	600	630	30	850	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.89	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1494	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1494	1504			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	789	1719	0	0	1411	632	663	32	895	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	273	0	11	11	0	0	0
Lane Group Flow (vph)	789	1719	0	0	1411	359	550	519	499	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	34.4	81.7			42.1	42.1	51.4	51.4	51.4			
Effective Green, g (s)	34.4	81.7			42.1	42.1	51.4	51.4	51.4			
Actuated g/C Ratio	0.24	0.56			0.29	0.29	0.35	0.35	0.35			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	814	1994			1476	460	596	530	533			
v/s Ratio Prot	c0.23	0.49			c0.28	0.23	0.33	c0.35	0.33			
v/s Ratio Perm												
v/c Ratio	0.97	0.86			0.96	0.78	0.92	0.98	0.94			
Uniform Delay, d1	54.8	26.9			50.5	47.2	44.9	46.3	45.2			
Progression Factor	1.00	1.00			0.95	1.09	1.00	1.00	1.00			
Incremental Delay, d2	23.9	5.2			6.3	4.2	20.0	33.4	24.0			
Delay (s)	78.7	32.1			54.5	55.6	64.9	79.6	69.2			
Level of Service	E	C			D	E	E	E	E			
Approach Delay (s)		46.7			54.8			71.2			0.0	
Approach LOS		D			D			E			A	

Intersection Summary			
HCM Average Control Delay	55.8	HCM Level of Service	E
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	99.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	2220	300	20	1280	150	680	70	150	40	40	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5005		3433	3177		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5005		3433	3177		1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	278	2467	333	22	1422	167	756	78	167	44	44	222
RTOR Reduction (vph)	0	0	67	0	10	0	0	95	0	0	0	1
Lane Group Flow (vph)	278	2467	266	22	1579	0	756	150	0	44	44	221
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	30.6	79.6	104.2	2.9	52.3		24.6	36.2		6.6	18.2	48.8
Effective Green, g (s)	30.6	79.6	104.2	2.9	52.3		24.6	36.2		6.6	18.2	48.8
Actuated g/C Ratio	0.21	0.55	0.72	0.02	0.36		0.17	0.25		0.05	0.13	0.34
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	374	2791	1138	35	1805		582	793		81	234	533
v/s Ratio Prot	c0.16	c0.49	0.04	0.01	0.32		c0.22	0.05		0.02	0.02	c0.09
v/s Ratio Perm			0.13									0.05
v/c Ratio	0.74	0.88	0.23	0.63	0.88		1.30	0.19		0.54	0.19	0.41
Uniform Delay, d1	53.5	28.7	6.9	70.5	43.3		60.2	42.8		67.7	56.8	37.1
Progression Factor	1.12	0.80	0.83	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.4	2.9	0.0	22.7	6.3		146.8	0.0		3.9	0.1	0.2
Delay (s)	64.2	25.9	5.7	93.2	49.6		207.0	42.9		71.7	56.9	37.3
Level of Service	E	C	A	F	D		F	D		E	E	D
Approach Delay (s)		27.2			50.2			166.9			44.9	
Approach LOS		C			D			F			D	

Intersection Summary			
HCM Average Control Delay	57.6	HCM Level of Service	E
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	19.2
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2301	0	0	1588	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			5.0		
Lane Util. Factor	0.91			0.91		
Frt	1.00			1.00		
Flt Protected	1.00			1.00		
Satd. Flow (prot)	5085			5085		
Flt Permitted	1.00			1.00		
Satd. Flow (perm)	5085			5085		
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2557	0	0	1764	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	2557	0	0	1764	0	0
Turn Type		Perm	Prot			Perm
Protected Phases	2		1	6	3	
Permitted Phases		2				3
Actuated Green, G (s)	106.6			105.6		
Effective Green, g (s)	106.6			105.6		
Actuated g/C Ratio	0.89			0.88		
Clearance Time (s)	4.0			5.0		
Vehicle Extension (s)	3.0			3.0		
Lane Grp Cap (vph)	4517			4475		
v/s Ratio Prot	c0.50			0.35		
v/s Ratio Perm						
v/c Ratio	0.57			0.39		
Uniform Delay, d1	1.5			1.3		
Progression Factor	1.00			1.00		
Incremental Delay, d2	0.5			0.2		
Delay (s)	2.0			1.5		
Level of Service	A			A		
Approach Delay (s)	2.0			1.5	0.0	
Approach LOS	A			A	A	

Intersection Summary			
HCM Average Control Delay	1.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	228	0	301	0	995	168	295	448	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0		4.0	4.0	
Lane Util. Factor					1.00	1.00		0.91		0.97	0.91	
Frt					1.00	0.85		0.98		1.00	1.00	
Flt Protected					0.95	1.00		1.00		0.95	1.00	
Satd. Flow (prot)					1770	1583		4975		3433	5085	
Flt Permitted					0.95	1.00		1.00		0.95	1.00	
Satd. Flow (perm)					1770	1583		4975		3433	5085	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	253	0	334	0	1106	187	328	498	0
RTOR Reduction (vph)	0	0	0	0	0	248	0	16	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	253	86	0	1277	0	328	498	0
Turn Type	Split			Split		Perm	Prot			Prot		
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						
Actuated Green, G (s)					18.5	18.5		28.6		13.1	45.7	
Effective Green, g (s)					18.5	18.5		28.6		13.1	45.7	
Actuated g/C Ratio					0.26	0.26		0.40		0.18	0.63	
Clearance Time (s)					4.0	4.0		4.0		4.0	4.0	
Vehicle Extension (s)					3.0	3.0		3.0		3.0	3.0	
Lane Grp Cap (vph)					454	406		1971		623	3219	
v/s Ratio Prot					c0.14			c0.26		c0.10	0.10	
v/s Ratio Perm						0.05						
v/c Ratio					0.56	0.21		0.65		0.53	0.15	
Uniform Delay, d1					23.3	21.1		17.7		26.7	5.4	
Progression Factor					1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2					1.5	0.3		0.7		0.8	0.0	
Delay (s)					24.8	21.4		18.5		27.5	5.4	
Level of Service					C	C		B		C	A	
Approach Delay (s)		0.0			22.8			18.5			14.2	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM Average Control Delay	18.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	72.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Appendix G

Intersection Analysis Worksheets
– 2030 With Project

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	370	1708	0	0	1958	832	400	60	1220	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.87	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1475	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1475	1504			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	394	1817	0	0	2083	885	426	64	1298	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	259	0	5	5	0	0	0
Lane Group Flow (vph)	394	1817	0	0	2083	626	383	699	696	0	0	0
Turn Type	Prot					Perm	Split		Prot			
Protected Phases	5	2			6		8	8	8			
Permitted Phases						6						
Actuated Green, G (s)	14.8	74.7			54.7	54.7	58.4	58.4	58.4			
Effective Green, g (s)	14.8	74.7			54.7	54.7	58.4	58.4	58.4			
Actuated g/C Ratio	0.10	0.52			0.38	0.38	0.40	0.40	0.40			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	350	1823			1918	597	677	594	606			
v/s Ratio Prot	0.11	c0.51			c0.41		0.23	c0.47	0.46			
v/s Ratio Perm						0.40						
v/c Ratio	1.13	1.00			1.09	1.05	0.57	1.18	1.15			
Uniform Delay, d1	65.1	35.0			45.1	45.1	33.5	43.3	43.3			
Progression Factor	1.00	1.00			0.62	0.50	1.00	1.00	1.00			
Incremental Delay, d2	86.6	20.3			43.3	38.0	1.1	96.4	85.1			
Delay (s)	151.7	55.3			71.2	60.6	34.6	139.7	128.4			
Level of Service	F	E			E	E	C	F	F			
Approach Delay (s)		72.5			68.0			112.7			0.0	
Approach LOS		E			E			F			A	

Intersection Summary			
HCM Average Control Delay	80.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	107.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	1777	840	214	1903	128	290	30	36	151	70	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5037		3433	3248		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5037		3433	3248		1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	133	1974	933	238	2114	142	322	33	40	168	78	444
RTOR Reduction (vph)	0	0	248	0	4	0	0	34	0	0	0	34
Lane Group Flow (vph)	133	1974	685	238	2252	0	322	39	0	168	78	410
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	19.4	59.9	80.8	24.1	65.0		20.9	23.2		18.1	20.4	39.8
Effective Green, g (s)	19.4	59.9	80.8	24.1	65.0		20.9	23.2		18.1	20.4	39.8
Actuated g/C Ratio	0.13	0.41	0.56	0.17	0.45		0.14	0.16		0.12	0.14	0.27
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	237	2101	882	294	2258		495	520		221	262	435
v/s Ratio Prot	0.08	0.39	c0.11	c0.13	c0.45		0.09	c0.01		0.09	0.04	c0.13
v/s Ratio Perm			0.32									0.13
v/c Ratio	0.56	0.94	0.78	0.81	1.00		0.65	0.08		0.76	0.30	0.94
Uniform Delay, d1	58.8	40.8	25.1	58.2	39.9		58.6	51.8		61.4	55.9	51.5
Progression Factor	1.00	0.95	0.88	1.30	0.62		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	1.1	0.4	11.8	16.4		2.3	0.0		12.9	0.2	28.7
Delay (s)	59.1	39.9	22.5	87.4	41.1		60.9	51.8		74.3	56.1	80.1
Level of Service	E	D	C	F	D		E	D		E	E	F
Approach Delay (s)		35.4			45.6			59.2			76.0	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM Average Control Delay	44.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	18.1
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Year 2030 + Proj Buildout AM
11: Del Mar Heights Road & Third Ave. — 11/23/2015

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1831	178	206	2103	141	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.91	1.00	0.97	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	3433	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2034	198	229	2337	157	48
RTOR Reduction (vph)	0	62	0	0	0	35
Lane Group Flow (vph)	2034	136	229	2337	157	13
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	74.0	74.0	18.6	95.6	40.4	40.4
Effective Green, g (s)	74.0	74.0	18.6	95.6	40.4	40.4
Actuated g/C Ratio	0.51	0.51	0.13	0.66	0.28	0.28
Clearance Time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2595	808	440	3353	957	441
v/s Ratio Prot	c0.40		0.07	c0.46	c0.05	
v/s Ratio Perm		0.09				0.01
v/c Ratio	0.78	0.17	0.52	0.70	0.16	0.03
Uniform Delay, d1	29.0	19.0	59.0	15.6	39.5	38.0
Progression Factor	0.36	0.03	1.43	0.08	1.00	1.00
Incremental Delay, d2	0.8	0.0	0.8	0.5	0.4	0.1
Delay (s)	11.1	0.5	85.4	1.7	39.9	38.2
Level of Service	B	A	F	A	D	D
Approach Delay (s)	10.1			9.2	39.5	
Approach LOS	B			A	D	

Intersection Summary			
HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis — Year 2030 + Proj Buildout AM
18: Del Mar Highlands Town Ctr. & El Camino Real — 11/23/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	13	13	114	21	130	107	383	101	165	1019	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95			1.00	1.00	0.97	0.91		0.97	0.91	
Frt	1.00	0.97			1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected	0.95	0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1664			1787	1583	3433	4926		3433	5059	
Flt Permitted	0.95	0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1664			1787	1583	3433	4926		3433	5059	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	94	14	14	127	23	144	119	426	112	183	1132	40
RTOR Reduction (vph)	0	9	0	0	0	115	0	38	0	0	2	0
Lane Group Flow (vph)	61	52	0	0	150	29	119	500	0	183	1170	0
Turn Type	Split			Split		Perm	Prot			Prot		
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						
Actuated Green, G (s)	6.7	6.7			14.5	14.5	6.4	23.4		10.4	27.4	
Effective Green, g (s)	6.7	6.7			14.5	14.5	6.4	23.4		10.4	27.4	
Actuated g/C Ratio	0.09	0.09			0.20	0.20	0.09	0.33		0.15	0.39	
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	159	157			365	323	309	1623		503	1952	
v/s Ratio Prot	c0.04	0.03			c0.08		0.03	0.10		c0.05	c0.23	
v/s Ratio Perm						0.02						
v/c Ratio	0.38	0.33			0.41	0.09	0.39	0.31		0.36	0.60	
Uniform Delay, d1	30.2	30.1			24.5	22.9	30.4	17.8		27.3	17.4	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	1.2			0.8	0.1	0.8	0.1		0.4	0.5	
Delay (s)	31.8	31.3			25.3	23.0	31.2	17.9		27.8	17.9	
Level of Service	C	C			C	C	C	B		C	B	
Approach Delay (s)		31.5			24.2			20.3			19.2	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM Average Control Delay	20.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	71.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

9: Del Mar Heights Road & I-5 NB Ramps

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	750	1768	0	0	1611	681	630	30	966	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.95	0.91	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.88	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	1681	1479	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.99	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	1681	1479	1504			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	789	1861	0	0	1696	717	663	32	1017	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	258	0	9	9	0	0	0
Lane Group Flow (vph)	789	1861	0	0	1696	459	590	554	550	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	31.0	83.3			47.1	47.1	49.8	49.8	49.8			
Effective Green, g (s)	31.0	83.3			47.1	47.1	49.8	49.8	49.8			
Actuated g/C Ratio	0.21	0.57			0.32	0.32	0.34	0.34	0.34			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	734	2033			1652	514	577	508	517			
v/s Ratio Prot	c0.23	0.53			c0.33	0.29	0.35	c0.37	0.37			
v/s Ratio Perm												
v/c Ratio	1.07	0.92			1.03	0.89	1.02	1.09	1.06			
Uniform Delay, d1	57.0	27.7			49.0	46.6	47.6	47.6	47.6			
Progression Factor	1.00	1.00			1.03	1.13	1.00	1.00	1.00			
Incremental Delay, d2	55.2	7.9			15.0	2.5	43.3	67.1	57.9			
Delay (s)	112.2	35.6			65.6	55.2	90.9	114.7	105.5			
Level of Service	F	D			E	E	F	F	F			
Approach Delay (s)		58.4			62.5			103.5			0.0	
Approach LOS		E			E			F			A	

Intersection Summary			
HCM Average Control Delay	71.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	105.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

10: Del Mar Heights Road & High Bluff Drive

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	2471	300	29	1632	195	680	70	156	72	40	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5004		3433	3173		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5004		3433	3173		1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	278	2746	333	32	1813	217	756	78	173	80	44	222
RTOR Reduction (vph)	0	0	62	0	10	0	0	96	0	0	0	1
Lane Group Flow (vph)	278	2746	271	32	2020	0	756	155	0	80	44	221
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	32.3	81.1	102.7	4.4	53.6		21.6	29.4		10.4	18.2	50.5
Effective Green, g (s)	32.3	81.1	102.7	4.4	53.6		21.6	29.4		10.4	18.2	50.5
Actuated g/C Ratio	0.22	0.56	0.71	0.03	0.37		0.15	0.20		0.07	0.13	0.35
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	394	2844	1121	54	1850		511	643		127	234	551
v/s Ratio Prot	c0.16	c0.54	0.04	0.02	c0.40		c0.22	0.05		0.05	0.02	c0.09
v/s Ratio Perm			0.13									0.05
v/c Ratio	0.71	0.97	0.24	0.59	1.09		1.48	0.24		0.63	0.19	0.40
Uniform Delay, d1	52.0	30.6	7.4	69.4	45.7		61.7	48.4		65.4	56.8	35.8
Progression Factor	1.09	0.82	0.95	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.5	6.5	0.0	11.1	50.8		226.1	0.1		6.9	0.1	0.2
Delay (s)	59.0	31.8	7.1	80.5	96.5		287.8	48.5		72.3	56.9	36.0
Level of Service	E	C	A	F	F		F	D		E	E	D
Approach Delay (s)		31.6			96.2			228.2			47.0	
Approach LOS		C			F			F			D	

Intersection Summary			
HCM Average Control Delay	81.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	2522	177	257	1724	375	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Lane Util. Factor	0.91	1.00	0.97	0.91	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	5085	1583	3433	5085	3433	1583
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	5085	1583	3433	5085	3433	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2655	186	271	1815	395	120
RTOR Reduction (vph)	0	43	0	0	0	93
Lane Group Flow (vph)	2655	143	271	1815	395	27
Turn Type		Perm	Prot			Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	64.6	64.6	16.4	84.0	27.0	27.0
Effective Green, g (s)	64.6	64.6	16.4	84.0	27.0	27.0
Actuated g/C Ratio	0.54	0.54	0.14	0.70	0.22	0.22
Clearance Time (s)	4.0	4.0	4.0	5.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2737	852	469	3560	772	356
v/s Ratio Prot	c0.52		c0.08	0.36	c0.12	
v/s Ratio Perm		0.09				0.02
v/c Ratio	0.97	0.17	0.58	0.51	0.51	0.08
Uniform Delay, d1	26.8	14.1	48.6	8.4	40.7	36.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.1	0.1	1.7	0.1	2.4	0.4
Delay (s)	37.9	14.1	50.3	8.5	43.1	37.1
Level of Service	D	B	D	A	D	D
Approach Delay (s)	36.3			13.9	41.7	
Approach LOS	D			B	D	

Intersection Summary			
HCM Average Control Delay	28.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	227	34	34	228	27	301	133	995	168	295	549	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	0.95	0.95			1.00	1.00	0.97	0.91		0.97	0.91	
Frt	1.00	0.96			1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1663			1783	1583	3433	4975		3433	5029	
Flt Permitted	0.95	0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1663			1783	1583	3433	4975		3433	5029	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	252	38	38	253	30	334	148	1106	187	328	610	49
RTOR Reduction (vph)	0	9	0	0	0	229	0	18	0	0	7	0
Lane Group Flow (vph)	166	153	0	0	283	105	148	1275	0	328	652	0
Turn Type	Split			Split		Perm	Prot			Prot		
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases						6						
Actuated Green, G (s)	14.4	14.4			22.6	22.6	10.0	31.6		14.8	36.4	
Effective Green, g (s)	14.4	14.4			22.6	22.6	10.0	31.6		14.8	36.4	
Actuated g/C Ratio	0.14	0.14			0.23	0.23	0.10	0.32		0.15	0.37	
Clearance Time (s)	4.0	4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	244	241			405	360	345	1582		511	1842	
v/s Ratio Prot	c0.10	0.09			c0.16		0.04	c0.26		c0.10	0.13	
v/s Ratio Perm						0.07						
v/c Ratio	0.68	0.63			0.70	0.29	0.43	0.81		0.64	0.35	
Uniform Delay, d1	40.3	40.0			35.3	31.8	42.0	31.1		39.8	22.9	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.6	5.3			5.2	0.5	0.9	3.1		2.8	0.1	
Delay (s)	47.9	45.4			40.5	32.2	42.9	34.2		42.6	23.1	
Level of Service	D	D			D	C	D	C		D	C	
Approach Delay (s)		46.6			36.0			35.1			29.5	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM Average Control Delay	34.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	99.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX H

QUEUING ANALYSIS WORKSHEETS

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	394	1817	2083	885	426	687	675
v/c Ratio	1.13	0.97	1.05	0.85	0.32	1.14	1.14
Control Delay	143.5	48.1	66.2	12.5	31.7	122.7	122.6
Queue Delay	0.0	3.3	0.0	2.8	0.0	0.0	0.0
Total Delay	143.5	51.3	66.2	15.2	31.7	122.7	122.6
Queue Length 50th (ft)	~221	850	~769	71	143	~793	~778
Queue Length 95th (ft)	#328	#1044	#858	m270	187	#1054	#1037
Internal Link Dist (ft)		584	1026			911	
Turn Bay Length (ft)	300			845			
Base Capacity (vph)	350	1872	1988	1047	1335	601	591
Starvation Cap Reductn	0	39	0	83	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.99	1.05	0.92	0.32	1.14	1.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	247	1723	1551	1009	578	547	533
v/c Ratio	0.88	0.93	0.77	0.91	0.91	0.96	0.93
Control Delay	85.4	37.2	34.5	20.2	55.4	66.5	58.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.4	37.2	34.5	20.2	55.4	66.5	58.7
Queue Length 50th (ft)	99	630	376	180	442	443	404
Queue Length 95th (ft)	#174	#816	436	#588	#675	#702	#638
Internal Link Dist (ft)		584	1026			911	
Turn Bay Length (ft)	300			200			
Base Capacity (vph)	280	1849	2021	1109	636	567	576
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.93	0.77	0.91	0.91	0.96	0.93

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	394	1817	2083	885	426	687	675
v/c Ratio	1.13	0.97	1.05	0.58	0.32	1.14	1.14
Control Delay	143.5	48.1	63.9	4.1	31.7	122.7	122.6
Queue Delay	0.0	3.3	0.0	0.0	0.0	0.0	0.0
Total Delay	143.5	51.3	63.9	4.1	31.7	122.7	122.6
Queue Length 50th (ft)	~221	850	~769	23	143	~793	~778
Queue Length 95th (ft)	#328	#1044	#858	m57	187	#1054	#1037
Internal Link Dist (ft)		584	1026			911	
Turn Bay Length (ft)	300			360			
Base Capacity (vph)	350	1872	1988	1533	1335	601	591
Starvation Cap Reductn	0	39	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.99	1.05	0.58	0.32	1.14	1.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	789	1861	1696	717	663	530	519
v/c Ratio	1.01	0.88	1.01	0.55	0.60	1.06	1.05
Control Delay	89.7	31.5	59.4	13.3	43.9	101.7	98.8
Queue Delay	0.0	2.4	0.0	0.0	0.0	0.0	0.0
Total Delay	89.7	33.8	59.4	13.3	43.9	101.7	98.8
Queue Length 50th (ft)	~393	756	~588	80	271	~566	~549
Queue Length 95th (ft)	#531	880	m496	m119	337	#811	#791
Internal Link Dist (ft)		584	1026			911	
Turn Bay Length (ft)	300			300			
Base Capacity (vph)	781	2106	1687	1297	1108	501	496
Starvation Cap Reductn	0	143	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.95	1.01	0.55	0.60	1.06	1.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	280	1189	590	304	2055	292	179	112	189	1096
v/c Ratio	0.86	0.56	0.67	0.81	0.94	0.90	0.13	0.22	0.84	1.06dr
Control Delay	100.5	25.4	9.6	78.5	47.7	94.4	40.0	7.7	96.0	57.5
Queue Delay	0.0	0.0	0.1	0.0	16.2	0.0	0.0	0.0	0.0	0.0
Total Delay	100.5	25.4	9.7	78.5	63.8	94.4	40.0	7.7	96.0	57.5
Queue Length 50th (ft)	144	125	47	154	671	143	46	0	92	323
Queue Length 95th (ft)	#226	226	105	184	#800	#227	68	48	#159	381
Internal Link Dist (ft)		549			574		799			805
Turn Bay Length (ft)	300			275		300		250	300	
Base Capacity (vph)	327	2114	876	404	2176	327	1438	528	227	1282
Starvation Cap Reductn	0	0	18	0	181	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.56	0.69	0.75	1.03	0.89	0.12	0.21	0.83	0.85

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	580	1952	609	177	1430	587	863	350	211	598
v/c Ratio	0.78	0.91	0.55	0.59	0.99	0.82	0.59	0.53	0.67	0.64
Control Delay	74.9	58.7	7.0	71.9	71.0	64.7	46.1	8.8	73.9	40.0
Queue Delay	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.9	58.7	7.2	71.9	71.0	64.7	46.1	8.8	73.9	40.0
Queue Length 50th (ft)	280	650	97	84	448	275	258	31	101	130
Queue Length 95th (ft)	m350	#940	m73	123	#831	324	254	103	141	153
Internal Link Dist (ft)		549			574		814			805
Turn Bay Length (ft)	300			275		300		250	300	
Base Capacity (vph)	741	2136	1273	298	1441	1141	1757	730	881	1263
Starvation Cap Reductn	0	0	164	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.91	0.55	0.59	0.99	0.51	0.49	0.48	0.24	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

APPENDIX I

MITIGATION ANALYSIS WORKSHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	111	1659	694	100	2018	80	201	10	21	113	59	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.0	4.4	4.9	4.4
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91		0.94	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5056		4990	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5056		4990	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	123	1843	771	111	2242	89	223	11	23	126	66	347
RTOR Reduction (vph)	0	0	276	0	3	0	0	0	23	0	0	25
Lane Group Flow (vph)	123	1843	495	111	2328	0	223	11	0	126	66	322
Turn Type	Prot		pm+ov	Prot			Prot		NA	Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	14.6	61.3	71.7	8.1	55.2		10.4	13.7	0.0	17.2	20.5	35.1
Effective Green, g (s)	14.6	61.3	71.7	8.1	55.2		10.4	13.7	0.0	17.2	20.5	35.1
Actuated g/C Ratio	0.12	0.51	0.60	0.07	0.46		0.09	0.11	0.00	0.14	0.17	0.29
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	418	2598	946	232	2326		432	213	0	254	318	463
v/s Ratio Prot	0.04	0.36	0.05	0.03	c0.46		0.04	0.01		c0.07	0.04	c0.08
v/s Ratio Perm			0.27									0.12
v/c Ratio	0.29	0.71	0.52	0.48	1.00		0.52	0.05	0.00	0.50	0.21	0.69
Uniform Delay, d1	48.0	22.5	14.1	53.9	32.4		52.4	47.4	60.0	47.4	42.8	37.7
Progression Factor	1.02	0.95	0.50	1.04	0.86		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.7	0.1	0.5	17.7		0.4	0.0	0.0	0.6	0.1	3.6
Delay (s)	49.1	22.1	7.2	56.5	45.4		52.8	47.4	60.0	48.0	42.9	41.3
Level of Service	D	C	A	E	D		D	D	E	D	D	D
Approach Delay (s)		19.1			45.9			53.2			43.1	
Approach LOS		B			D			D			D	

Intersection Summary			
HCM Average Control Delay	33.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	249	2414	259	29	1743	74	637	67	150	65	30	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91		0.94	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5054		4990	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5054		4990	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	277	2682	288	32	1937	82	708	74	167	72	33	91
RTOR Reduction (vph)	0	0	59	0	3	0	0	0	118	0	0	1
Lane Group Flow (vph)	277	2682	229	32	2016	0	708	74	49	72	33	90
Turn Type	Prot		pm+ov	Prot			Prot		Perm	Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2						8			4
Actuated Green, G (s)	15.3	72.5	85.9	2.8	60.4		13.4	22.0	22.0	8.0	16.6	31.9
Effective Green, g (s)	15.3	72.5	85.9	2.8	60.4		13.4	22.0	22.0	8.0	16.6	31.9
Actuated g/C Ratio	0.12	0.58	0.69	0.02	0.48		0.11	0.18	0.18	0.06	0.13	0.26
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	420	2949	1088	77	2442		535	328	279	113	247	404
v/s Ratio Prot	c0.08	c0.53	0.02	0.01	0.40		c0.14	c0.04		0.04	0.02	0.03
v/s Ratio Perm			0.12						0.03			0.03
v/c Ratio	0.66	0.91	0.21	0.42	0.83		1.32	0.23	0.18	0.64	0.13	0.22
Uniform Delay, d1	52.4	23.3	7.1	60.3	27.8		55.8	44.2	43.8	57.1	47.9	36.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	5.4	0.0	1.3	3.3		158.2	0.1	0.1	8.4	0.1	0.1
Delay (s)	55.2	28.7	7.2	61.6	31.1		214.0	44.3	43.9	65.4	47.9	36.9
Level of Service	E	C	A	E	C		F	D	D	E	D	D
Approach Delay (s)		29.1			31.6			170.8			49.2	
Approach LOS		C			C			F			D	

Intersection Summary			
HCM Average Control Delay	51.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	14.8
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	111	1659	694	100	2018	80	201	10	21	113	59	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.94	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5056		4990	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5056		4990	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	123	1843	771	111	2242	89	223	11	23	126	66	347
RTOR Reduction (vph)	0	0	256	0	3	0	0	0	20	0	0	1
Lane Group Flow (vph)	123	1843	515	111	2328	0	223	11	3	126	66	346
Turn Type	Prot		pm+ov	Prot			Prot		Perm	Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2						8			4
Actuated Green, G (s)	15.3	62.7	68.9	11.8	59.6		6.2	15.4	15.4	10.4	19.6	34.9
Effective Green, g (s)	15.3	62.7	68.9	11.8	59.6		6.2	15.4	15.4	10.4	19.6	34.9
Actuated g/C Ratio	0.13	0.52	0.57	0.10	0.50		0.05	0.13	0.13	0.09	0.16	0.29
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	226	2657	909	174	2511		258	239	203	153	304	460
v/s Ratio Prot	0.07	c0.36	0.03	0.06	c0.46		0.04	0.01		c0.07	0.04	c0.10
v/s Ratio Perm			0.30						0.00			0.12
v/c Ratio	0.54	0.69	0.57	0.64	0.93		0.86	0.05	0.01	0.82	0.22	0.75
Uniform Delay, d1	49.1	21.5	16.1	52.0	28.2		56.5	45.9	45.7	53.9	43.5	38.6
Progression Factor	1.06	1.05	1.10	1.12	1.12		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.8	0.3	4.9	6.6		23.9	0.0	0.0	27.6	0.1	6.1
Delay (s)	53.0	23.3	17.9	63.1	38.3		80.4	45.9	45.7	81.5	43.7	44.7
Level of Service	D	C	B	E	D		F	D	D	F	D	D
Approach Delay (s)		23.1			39.4			75.8			53.2	
Approach LOS		C			D			E			D	

Intersection Summary			
HCM Average Control Delay	34.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	249	2414	259	29	1743	74	637	67	150	65	30	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.94	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5054		4990	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5054		4990	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	277	2682	288	32	1937	82	708	74	167	72	33	91
RTOR Reduction (vph)	0	0	55	0	3	0	0	0	96	0	0	0
Lane Group Flow (vph)	277	2682	233	32	2016	0	708	74	71	72	33	91
Turn Type	Prot		pm+ov	Prot			Prot		Perm	Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2						8			4
Actuated Green, G (s)	29.7	85.3	102.9	4.4	60.4		17.6	25.8	25.8	9.8	18.0	47.7
Effective Green, g (s)	29.7	85.3	102.9	4.4	60.4		17.6	25.8	25.8	9.8	18.0	47.7
Actuated g/C Ratio	0.20	0.59	0.71	0.03	0.42		0.12	0.18	0.18	0.07	0.12	0.33
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	363	2991	1123	54	2105		606	331	282	120	231	521
v/s Ratio Prot	c0.16	c0.53	0.03	0.02	c0.40		c0.14	0.04		0.04	0.02	0.04
v/s Ratio Perm			0.12						c0.04			0.02
v/c Ratio	0.76	0.90	0.21	0.59	0.96		1.17	0.22	0.25	0.60	0.14	0.17
Uniform Delay, d1	54.3	26.0	7.2	69.4	41.1		63.7	51.0	51.3	65.7	56.6	34.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.3	4.7	0.0	11.1	11.9		92.6	0.1	0.2	5.3	0.1	0.1
Delay (s)	62.6	30.8	7.2	80.5	53.0		156.3	51.2	51.5	71.0	56.7	34.7
Level of Service	E	C	A	F	D		F	D	D	E	E	C
Approach Delay (s)		31.4			53.4			129.7			51.7	
Approach LOS		C			D			F			D	

Intersection Summary			
HCM Average Control Delay	53.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	20.4
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	111	1659	694	100	2018	80	201	10	21	113	59	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.0	4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5056		3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5056		3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	123	1843	771	111	2242	89	223	11	23	126	66	347
RTOR Reduction (vph)	0	0	273	0	3	0	0	0	23	0	0	26
Lane Group Flow (vph)	123	1843	498	111	2328	0	223	11	0	126	66	321
Turn Type	Prot		pm+ov	Prot			Prot		NA	Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	14.3	59.7	72.3	7.7	53.5		12.6	14.7	0.0	18.2	20.3	34.6
Effective Green, g (s)	14.3	59.7	72.3	7.7	53.5		12.6	14.7	0.0	18.2	20.3	34.6
Actuated g/C Ratio	0.12	0.50	0.60	0.06	0.45		0.10	0.12	0.00	0.15	0.17	0.29
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	211	2530	954	220	2254		360	228	0	268	315	456
v/s Ratio Prot	0.07	0.36	0.05	0.03	c0.46		c0.06	0.01		0.07	0.04	c0.08
v/s Ratio Perm			0.26									0.12
v/c Ratio	0.58	0.73	0.52	0.50	1.03		0.62	0.05	0.00	0.47	0.21	0.70
Uniform Delay, d1	50.0	23.8	13.8	54.3	33.2		51.4	46.5	60.0	46.5	42.9	38.1
Progression Factor	1.02	0.94	0.55	1.05	0.86		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	1.0	0.1	0.6	26.9		2.2	0.0	0.0	0.5	0.1	4.0
Delay (s)	52.3	23.3	7.7	57.6	55.4		53.6	46.5	60.0	47.0	43.1	42.2
Level of Service	D	C	A	E	E		D	D	E	D	D	D
Approach Delay (s)		20.2			55.5			53.9			43.4	
Approach LOS		C			E			D			D	

Intersection Summary			
HCM Average Control Delay	38.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	249	2414	259	29	1743	74	637	67	150	65	30	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5054		3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5054		3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	277	2682	288	32	1937	82	708	74	167	72	33	91
RTOR Reduction (vph)	0	0	55	0	3	0	0	0	101	0	0	0
Lane Group Flow (vph)	277	2682	233	32	2016	0	708	74	66	72	33	91
Turn Type	Prot		pm+ov	Prot			Prot		Perm	Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2						8			4
Actuated Green, G (s)	30.7	79.9	99.5	2.8	52.4		19.6	29.1	29.1	8.5	18.0	48.7
Effective Green, g (s)	30.7	79.9	99.5	2.8	52.4		19.6	29.1	29.1	8.5	18.0	48.7
Actuated g/C Ratio	0.22	0.57	0.71	0.02	0.37		0.14	0.21	0.21	0.06	0.13	0.35
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	388	2902	1125	69	1892		481	387	329	107	240	551
v/s Ratio Prot	c0.16	c0.53	0.03	0.01	c0.40		c0.21	0.04		0.04	0.02	0.04
v/s Ratio Perm			0.12						c0.04			0.02
v/c Ratio	0.71	0.92	0.21	0.46	1.07		1.47	0.19	0.20	0.67	0.14	0.17
Uniform Delay, d1	50.6	27.3	6.9	67.9	43.8		60.2	45.7	45.8	64.4	54.1	31.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.1	6.4	0.0	1.8	40.7		223.5	0.1	0.1	12.3	0.1	0.1
Delay (s)	55.7	33.7	6.9	69.6	84.5		283.7	45.8	46.0	76.7	54.2	31.6
Level of Service	E	C	A	E	F		F	D	D	E	D	C
Approach Delay (s)		33.2			84.2			223.3			52.0	
Approach LOS		C			F			F			D	

Intersection Summary			
HCM Average Control Delay	78.0	HCM Level of Service	E
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.4
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	108	1624	674	97	1964	78	195	10	21	111	57	303
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.94	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5056		4990	1674		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5056		4990	1674		1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	120	1804	749	108	2182	87	217	11	23	123	63	337
RTOR Reduction (vph)	0	0	230	0	2	0	0	20	0	0	0	7
Lane Group Flow (vph)	120	1804	519	108	2267	0	217	14	0	123	63	330
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	17.3	79.2	90.0	11.2	73.5		10.8	17.4		12.5	19.1	36.4
Effective Green, g (s)	17.3	79.2	90.0	11.2	73.5		10.8	17.4		12.5	19.1	36.4
Actuated g/C Ratio	0.12	0.57	0.64	0.08	0.52		0.08	0.12		0.09	0.14	0.26
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	219	2877	1018	142	2654		385	208		158	254	412
v/s Ratio Prot	0.07	0.35	0.04	0.06	c0.45		0.04	0.01		c0.07	0.03	c0.10
v/s Ratio Perm			0.29									0.11
v/c Ratio	0.55	0.63	0.51	0.76	0.85		0.56	0.07		0.78	0.25	0.80
Uniform Delay, d1	57.7	20.5	13.3	63.1	28.6		62.3	54.1		62.4	54.0	48.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.5	1.0	0.1	19.1	3.8		1.1	0.0		19.4	0.2	10.2
Delay (s)	59.2	21.5	13.4	82.2	32.4		63.5	54.2		81.8	54.2	58.6
Level of Service	E	C	B	F	C		E	D		F	D	E
Approach Delay (s)		20.9			34.6			62.2			63.5	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM Average Control Delay	32.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.4
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	249	2414	259	29	1743	74	637	67	150	65	30	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.94	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5054		4990	1669		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5054		4990	1669		1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	277	2682	288	32	1937	82	708	74	167	72	33	91
RTOR Reduction (vph)	0	0	56	0	3	0	0	65	0	0	0	0
Lane Group Flow (vph)	277	2682	232	32	2016	0	708	176	0	72	33	91
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	29.7	83.7	101.9	4.4	58.8		18.2	27.4		9.8	19.0	48.7
Effective Green, g (s)	29.7	83.7	101.9	4.4	58.8		18.2	27.4		9.8	19.0	48.7
Actuated g/C Ratio	0.20	0.58	0.70	0.03	0.41		0.13	0.19		0.07	0.13	0.34
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	363	2935	1112	54	2049		626	315		120	244	532
v/s Ratio Prot	c0.16	c0.53	0.03	0.02	c0.40		c0.14	c0.11		0.04	0.02	0.04
v/s Ratio Perm			0.12									0.02
v/c Ratio	0.76	0.91	0.21	0.59	0.98		1.13	0.56		0.60	0.14	0.17
Uniform Delay, d1	54.3	27.4	7.5	69.4	42.6		63.4	53.3		65.7	55.7	33.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.3	5.7	0.0	11.1	16.4		77.8	1.2		5.3	0.1	0.1
Delay (s)	62.6	33.1	7.5	80.5	59.1		141.2	54.5		71.0	55.8	34.0
Level of Service	E	C	A	F	E		F	D		E	E	C
Approach Delay (s)		33.3			59.4			119.2			51.3	
Approach LOS		C			E			F			D	

Intersection Summary			
HCM Average Control Delay	54.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	20.4
Intersection Capacity Utilization	84.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	111	1659	694	100	2018	80	201	10	21	113	59	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.0	4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5056		3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5056		3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	123	1843	771	111	2242	89	223	11	23	126	66	347
RTOR Reduction (vph)	0	0	290	0	3	0	0	0	23	0	0	26
Lane Group Flow (vph)	123	1843	481	111	2328	0	223	11	0	126	66	321
Turn Type	Prot		pm+ov	Prot			Prot		NA	Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	14.3	56.7	69.3	10.7	53.5		12.6	14.7	0.0	18.2	20.3	34.6
Effective Green, g (s)	14.3	56.7	69.3	10.7	53.5		12.6	14.7	0.0	18.2	20.3	34.6
Actuated g/C Ratio	0.12	0.47	0.58	0.09	0.45		0.10	0.12	0.00	0.15	0.17	0.29
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	211	2403	914	158	2254		360	228	0	268	315	456
v/s Ratio Prot	0.07	c0.36	0.06	0.06	c0.46		c0.06	0.01		0.07	0.04	c0.08
v/s Ratio Perm			0.25									0.12
v/c Ratio	0.58	0.77	0.53	0.70	1.03		0.62	0.05	0.00	0.47	0.21	0.70
Uniform Delay, d1	50.0	26.2	15.4	53.1	33.2		51.4	46.5	60.0	46.5	42.9	38.1
Progression Factor	1.02	0.93	0.56	1.10	0.86		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	1.3	0.1	9.7	26.9		2.2	0.0	0.0	0.5	0.1	4.0
Delay (s)	52.3	25.7	8.8	68.2	55.4		53.6	46.5	60.0	47.0	43.1	42.2
Level of Service	D	C	A	E	E		D	D	E	D	D	D
Approach Delay (s)		22.1			55.9			53.9			43.4	
Approach LOS		C			E			D			D	

Intersection Summary			
HCM Average Control Delay	39.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	249	2414	259	29	1743	74	637	67	150	65	30	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5054		3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5054		3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	277	2682	288	32	1937	82	708	74	167	72	33	91
RTOR Reduction (vph)	0	0	57	0	3	0	0	0	101	0	0	0
Lane Group Flow (vph)	277	2682	231	32	2016	0	708	74	66	72	33	91
Turn Type	Prot		pm+ov	Prot			Prot		Perm	Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2						8			4
Actuated Green, G (s)	30.7	78.4	98.0	4.3	52.4		19.6	29.1	29.1	8.5	18.0	48.7
Effective Green, g (s)	30.7	78.4	98.0	4.3	52.4		19.6	29.1	29.1	8.5	18.0	48.7
Actuated g/C Ratio	0.22	0.56	0.70	0.03	0.37		0.14	0.21	0.21	0.06	0.13	0.35
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	388	2848	1108	54	1892		481	387	329	107	240	551
v/s Ratio Prot	c0.16	c0.53	0.03	0.02	c0.40		c0.21	0.04		0.04	0.02	0.04
v/s Ratio Perm			0.12						c0.04			0.02
v/c Ratio	0.71	0.94	0.21	0.59	1.07		1.47	0.19	0.20	0.67	0.14	0.17
Uniform Delay, d1	50.6	28.7	7.4	67.0	43.8		60.2	45.7	45.8	64.4	54.1	31.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.1	7.9	0.0	11.1	40.7		223.5	0.1	0.1	12.3	0.1	0.1
Delay (s)	55.7	36.5	7.4	78.1	84.5		283.7	45.8	45.9	76.7	54.2	31.6
Level of Service	E	D	A	E	F		F	D	D	E	D	C
Approach Delay (s)		35.6			84.4			223.3			52.0	
Approach LOS		D			F			F			D	

Intersection Summary			
HCM Average Control Delay	79.3	HCM Level of Service	E
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	20.4
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	370	1708	0	0	1958	832	400	60	1220	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.97	0.95	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.86	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	3433	1529	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	3433	1529	1504			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	394	1817	0	0	2083	885	426	64	1298	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	428	0	6	6	0	0	0
Lane Group Flow (vph)	394	1817	0	0	2083	457	426	681	669	0	0	0
Turn Type	Prot					Perm	Split		Prot			
Protected Phases	5	2			6		8	8	8			
Permitted Phases						6						
Actuated Green, G (s)	14.8	76.7			56.7	56.7	56.4	56.4	56.4			
Effective Green, g (s)	14.8	76.7			56.7	56.7	56.4	56.4	56.4			
Actuated g/C Ratio	0.10	0.53			0.39	0.39	0.39	0.39	0.39			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	350	1872			1988	619	1335	595	585			
v/s Ratio Prot	0.11	c0.51			c0.41		0.12	c0.45	0.44			
v/s Ratio Perm						0.29						
v/c Ratio	1.13	0.97			1.05	0.74	0.32	1.14	1.14			
Uniform Delay, d1	65.1	33.1			44.1	37.8	30.9	44.3	44.3			
Progression Factor	1.00	1.00			0.78	0.95	1.00	1.00	1.00			
Incremental Delay, d2	86.6	14.9			28.9	4.0	0.1	83.6	83.5			
Delay (s)	151.7	48.0			63.3	39.8	31.0	127.9	127.8			
Level of Service	F	D			E	D	C	F	F			
Approach Delay (s)		66.5			56.3			104.8			0.0	
Approach LOS		E			E			F			A	

Intersection Summary			
HCM Average Control Delay	72.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	107.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	1777	840	214	1903	128	290	30	36	151	70	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91		0.94	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5037		4990	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5037		4990	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	133	1974	933	238	2114	142	322	33	40	168	78	444
RTOR Reduction (vph)	0	0	223	0	5	0	0	0	35	0	0	6
Lane Group Flow (vph)	133	1974	710	238	2251	0	322	33	5	168	78	438
Turn Type	Prot		pm+ov	Prot			Prot		Perm	Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2						8			4
Actuated Green, G (s)	21.0	76.2	90.6	13.1	68.7		14.4	17.4	17.4	18.6	21.6	42.6
Effective Green, g (s)	21.0	76.2	90.6	13.1	68.7		14.4	17.4	17.4	18.6	21.6	42.6
Actuated g/C Ratio	0.14	0.53	0.62	0.09	0.47		0.10	0.12	0.12	0.13	0.15	0.29
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	497	2672	989	310	2386		496	224	190	227	278	465
v/s Ratio Prot	0.04	0.39	0.07	0.07	c0.45		0.06	0.02		c0.09	0.04	c0.14
v/s Ratio Perm			0.38						0.00			0.14
v/c Ratio	0.27	0.74	0.72	0.77	0.94		0.65	0.15	0.03	0.74	0.28	0.94
Uniform Delay, d1	55.2	26.7	18.5	64.5	36.3		62.9	57.2	56.3	60.9	54.8	50.0
Progression Factor	1.01	0.88	1.14	1.28	0.41		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.2	0.2	8.1	7.8		2.2	0.1	0.0	10.8	0.2	27.5
Delay (s)	55.7	23.7	21.3	90.7	22.7		65.1	57.3	56.3	71.6	55.0	77.5
Level of Service	E	C	C	F	C		E	E	E	E	E	E
Approach Delay (s)		24.4			29.2			63.5			73.5	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM Average Control Delay	33.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	750	1778	0	0	1597	677	630	30	974	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	1.00	0.97	0.95	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.86	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539			5085	1583	3433	1520	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539			5085	1583	3433	1520	1504			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	789	1872	0	0	1681	713	663	32	1025	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	409	0	8	8	0	0	0
Lane Group Flow (vph)	789	1872	0	0	1681	304	663	526	515	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	26.0	67.9			36.7	36.7	40.2	40.2	40.2			
Effective Green, g (s)	26.0	67.9			36.7	36.7	40.2	40.2	40.2			
Actuated g/C Ratio	0.22	0.57			0.31	0.31	0.34	0.34	0.34			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	744	2002			1555	484	1150	509	504			
v/s Ratio Prot	c0.23	0.53			c0.33	0.19	0.19	c0.35	0.34			
v/s Ratio Perm												
v/c Ratio	1.06	0.94			1.08	0.63	0.58	1.03	1.02			
Uniform Delay, d1	47.0	24.0			41.6	35.8	32.9	39.9	39.9			
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	50.2	9.7			48.2	6.1	0.7	48.8	45.7			
Delay (s)	97.2	33.7			89.8	41.9	33.6	88.7	85.6			
Level of Service	F	C			F	D	C	F	F			
Approach Delay (s)		52.6			75.5			66.5			0.0	
Approach LOS		D			E			E			A	

Intersection Summary			
HCM Average Control Delay	64.2	HCM Level of Service	E
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	99.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	2489	300	29	1614	193	680	70	157	75	40	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91		0.94	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5004		4990	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5004		4990	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	278	2766	333	32	1793	214	756	78	174	83	44	222
RTOR Reduction (vph)	0	0	60	0	8	0	0	0	95	0	0	2
Lane Group Flow (vph)	278	2766	273	32	1999	0	756	78	79	83	44	220
Turn Type	Prot		pm+ov	Prot			Prot		Perm	Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2						8			4
Actuated Green, G (s)	15.0	86.5	104.3	2.8	74.7		17.8	25.3	25.3	10.7	18.2	33.2
Effective Green, g (s)	15.0	86.5	104.3	2.8	74.7		17.8	25.3	25.3	10.7	18.2	33.2
Actuated g/C Ratio	0.10	0.60	0.72	0.02	0.52		0.12	0.17	0.17	0.07	0.13	0.23
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	355	3033	1139	66	2578		613	325	276	131	234	362
v/s Ratio Prot	c0.08	c0.54	0.03	0.01	0.40		c0.15	0.04		0.05	0.02	c0.06
v/s Ratio Perm			0.14						0.05			0.08
v/c Ratio	0.78	0.91	0.24	0.48	0.78		1.23	0.24	0.29	0.63	0.19	0.61
Uniform Delay, d1	63.4	25.9	6.9	70.4	28.4		63.6	51.6	52.0	65.2	56.8	50.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.0	5.4	0.0	2.0	2.4		118.7	0.1	0.2	7.2	0.1	2.0
Delay (s)	73.4	31.3	6.9	72.4	30.7		182.3	51.7	52.2	72.4	56.9	52.1
Level of Service	E	C	A	E	C		F	D	D	E	E	D
Approach Delay (s)		32.4			31.4			149.7			57.5	
Approach LOS		C			C			F			E	

Intersection Summary			
HCM Average Control Delay	50.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	19.2
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	370	1708	0	0	1958	832	400	60	1220	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	0.88	0.97	0.95	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.86	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539			5085	2787	3433	1529	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539			5085	2787	3433	1529	1504			
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	394	1817	0	0	2083	885	426	64	1298	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	375	0	6	6	0	0	0
Lane Group Flow (vph)	394	1817	0	0	2083	510	426	681	669	0	0	0
Turn Type	Prot					Perm	Split		Prot			
Protected Phases	5	2			6		8	8	8			
Permitted Phases						6						
Actuated Green, G (s)	14.8	76.7			56.7	56.7	56.4	56.4	56.4			
Effective Green, g (s)	14.8	76.7			56.7	56.7	56.4	56.4	56.4			
Actuated g/C Ratio	0.10	0.53			0.39	0.39	0.39	0.39	0.39			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	350	1872			1988	1090	1335	595	585			
v/s Ratio Prot	0.11	c0.51			c0.41		0.12	c0.45	0.44			
v/s Ratio Perm						0.18						
v/c Ratio	1.13	0.97			1.05	0.47	0.32	1.14	1.14			
Uniform Delay, d1	65.1	33.1			44.1	32.9	30.9	44.3	44.3			
Progression Factor	1.00	1.00			0.79	0.77	1.00	1.00	1.00			
Incremental Delay, d2	86.6	14.9			28.7	0.7	0.1	83.6	83.5			
Delay (s)	151.7	48.0			63.5	26.2	31.0	127.9	127.8			
Level of Service	F	D			E	C	C	F	F			
Approach Delay (s)		66.5			52.3			104.8			0.0	
Approach LOS		E			D			F			A	

Intersection Summary			
HCM Average Control Delay	70.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	18.2
Intersection Capacity Utilization	107.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	1777	840	214	1903	128	290	30	36	151	70	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		0.94	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5037		4990	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5037		4990	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	133	1974	933	238	2114	142	322	33	40	168	78	444
RTOR Reduction (vph)	0	0	216	0	5	0	0	0	35	0	0	4
Lane Group Flow (vph)	133	1974	717	238	2251	0	322	33	5	168	78	440
Turn Type	Prot		pm+ov	Prot			Prot		Perm	Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2						8			4
Actuated Green, G (s)	22.0	76.5	90.7	12.9	67.8		14.2	17.3	17.3	18.6	21.7	43.7
Effective Green, g (s)	22.0	76.5	90.7	12.9	67.8		14.2	17.3	17.3	18.6	21.7	43.7
Actuated g/C Ratio	0.15	0.53	0.63	0.09	0.47		0.10	0.12	0.12	0.13	0.15	0.30
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	269	2683	990	305	2355		489	222	189	227	279	477
v/s Ratio Prot	0.08	0.39	0.07	0.07	c0.45		0.06	0.02		c0.09	0.04	c0.14
v/s Ratio Perm			0.38						0.00			0.14
v/c Ratio	0.49	0.74	0.72	0.78	0.96		0.66	0.15	0.03	0.74	0.28	0.92
Uniform Delay, d1	56.4	26.4	18.6	64.7	37.2		63.1	57.2	56.4	60.9	54.7	49.0
Progression Factor	1.02	0.88	1.14	1.28	0.42		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.2	0.2	9.3	9.2		2.4	0.1	0.0	10.8	0.2	23.1
Delay (s)	57.6	23.5	21.4	92.3	24.7		65.5	57.4	56.4	71.6	54.9	72.1
Level of Service	E	C	C	F	C		E	E	E	E	D	E
Approach Delay (s)		24.4			31.1			63.9			70.0	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM Average Control Delay	34.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	750	1778	0	0	1597	677	630	30	974	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Lane Util. Factor	0.97	0.95			0.91	0.88	0.97	0.95	0.95			
Frt	1.00	1.00			1.00	0.85	1.00	0.86	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (prot)	3433	3539			5085	2787	3433	1520	1504			
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00	1.00			
Satd. Flow (perm)	3433	3539			5085	2787	3433	1520	1504			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	789	1872	0	0	1681	713	663	32	1025	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	361	0	10	10	0	0	0
Lane Group Flow (vph)	789	1872	0	0	1681	352	663	524	513	0	0	0
Turn Type	Prot					Prot	Split		Prot			
Protected Phases	5	2			6	6	8	8	8			
Permitted Phases												
Actuated Green, G (s)	34.3	89.3			49.8	49.8	48.8	48.8	48.8			
Effective Green, g (s)	34.3	89.3			49.8	49.8	48.8	48.8	48.8			
Actuated g/C Ratio	0.23	0.60			0.33	0.33	0.33	0.33	0.33			
Clearance Time (s)	5.2	6.3			6.3	6.3	5.6	5.6	5.6			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0	3.0	3.0			
Lane Grp Cap (vph)	785	2107			1688	925	1117	495	489			
v/s Ratio Prot	c0.23	0.53			c0.33	0.13	0.19	c0.34	0.34			
v/s Ratio Perm												
v/c Ratio	1.01	0.89			1.00	0.38	0.59	1.06	1.05			
Uniform Delay, d1	57.9	26.1			50.0	38.3	42.3	50.6	50.6			
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	33.4	6.1			20.9	1.2	0.9	56.8	54.1			
Delay (s)	91.2	32.1			70.9	39.5	43.2	107.4	104.7			
Level of Service	F	C			E	D	D	F	F			
Approach Delay (s)		49.7			61.6			81.8			0.0	
Approach LOS		D			E			F			A	

Intersection Summary			
HCM Average Control Delay	62.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	17.1
Intersection Capacity Utilization	99.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	2489	300	29	1614	193	680	70	157	75	40	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		0.94	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5004		4990	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5004		4990	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	278	2766	333	32	1793	214	756	78	174	83	44	222
RTOR Reduction (vph)	0	0	60	0	9	0	0	0	111	0	0	0
Lane Group Flow (vph)	278	2766	273	32	1998	0	756	78	63	83	44	222
Turn Type	Prot		pm+ov	Prot			Prot		Perm	Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2						8			4
Actuated Green, G (s)	29.1	84.6	104.3	2.8	58.7		19.7	26.8	26.8	11.1	18.2	47.3
Effective Green, g (s)	29.1	84.6	104.3	2.8	58.7		19.7	26.8	26.8	11.1	18.2	47.3
Actuated g/C Ratio	0.20	0.58	0.72	0.02	0.40		0.14	0.18	0.18	0.08	0.13	0.33
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	355	2967	1139	66	2026		678	344	293	135	234	516
v/s Ratio Prot	c0.16	c0.54	0.03	0.01	c0.40		c0.15	0.04		0.05	0.02	c0.09
v/s Ratio Perm			0.14						0.04			0.05
v/c Ratio	0.78	0.93	0.24	0.48	0.99		1.12	0.23	0.22	0.61	0.19	0.43
Uniform Delay, d1	55.0	27.6	6.9	70.4	42.7		62.6	50.3	50.2	64.9	56.8	38.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.0	6.8	0.0	2.0	17.0		70.6	0.1	0.1	5.7	0.1	0.2
Delay (s)	64.9	34.4	6.9	72.4	59.7		133.3	50.4	50.3	70.6	56.9	38.5
Level of Service	E	C	A	E	E		F	D	D	E	E	D
Approach Delay (s)		34.2			59.9			112.5			48.5	
Approach LOS		C			E			F			D	

Intersection Summary			
HCM Average Control Delay	54.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	1777	840	214	1903	128	290	30	36	151	70	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5037		3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5037		3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	133	1974	933	238	2114	142	322	33	40	168	78	444
RTOR Reduction (vph)	0	0	214	0	5	0	0	0	35	0	0	4
Lane Group Flow (vph)	133	1974	719	238	2251	0	322	33	5	168	78	440
Turn Type	Prot		pm+ov	Prot			Prot		Perm	Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2						8			4
Actuated Green, G (s)	22.2	74.9	91.2	12.7	65.8		16.3	18.5	18.5	19.2	21.4	43.6
Effective Green, g (s)	22.2	74.9	91.2	12.7	65.8		16.3	18.5	18.5	19.2	21.4	43.6
Actuated g/C Ratio	0.15	0.52	0.63	0.09	0.45		0.11	0.13	0.13	0.13	0.15	0.30
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	271	2627	996	301	2286		386	238	202	234	275	476
v/s Ratio Prot	0.08	0.39	0.08	0.07	c0.45		c0.09	0.02		0.09	0.04	c0.14
v/s Ratio Perm			0.37						0.00			0.14
v/c Ratio	0.49	0.75	0.72	0.79	0.98		0.83	0.14	0.03	0.72	0.28	0.92
Uniform Delay, d1	56.2	27.7	18.3	64.8	39.1		63.0	56.2	55.4	60.3	55.0	49.1
Progression Factor	1.02	0.88	1.15	1.30	0.44		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.2	0.2	10.2	13.7		13.7	0.1	0.0	8.4	0.2	23.4
Delay (s)	57.3	24.6	21.3	94.7	30.8		76.8	56.3	55.4	68.7	55.2	72.5
Level of Service	E	C	C	F	C		E	E	E	E	E	E
Approach Delay (s)		25.0			36.9			72.9			69.6	
Approach LOS		C			D			E			E	

Intersection Summary			
HCM Average Control Delay	37.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	2489	300	29	1614	193	680	70	157	75	40	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5004		3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5004		3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	278	2766	333	32	1793	214	756	78	174	83	44	222
RTOR Reduction (vph)	0	0	60	0	10	0	0	0	97	0	0	1
Lane Group Flow (vph)	278	2766	273	32	1997	0	756	78	77	83	44	221
Turn Type	Prot		pm+ov	Prot			Prot		Perm	Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2						8			4
Actuated Green, G (s)	32.3	82.7	104.3	2.8	53.6		21.6	29.1	29.1	10.7	18.2	50.5
Effective Green, g (s)	32.3	82.7	104.3	2.8	53.6		21.6	29.1	29.1	10.7	18.2	50.5
Actuated g/C Ratio	0.22	0.57	0.72	0.02	0.37		0.15	0.20	0.20	0.07	0.13	0.35
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	394	2900	1139	66	1850		511	374	318	131	234	551
v/s Ratio Prot	c0.16	c0.54	0.04	0.01	c0.40		c0.22	0.04		0.05	0.02	c0.09
v/s Ratio Perm			0.14						0.05			0.05
v/c Ratio	0.71	0.95	0.24	0.48	1.08		1.48	0.21	0.24	0.63	0.19	0.40
Uniform Delay, d1	52.0	29.3	6.9	70.4	45.7		61.7	48.3	48.7	65.2	56.8	35.8
Progression Factor	1.07	0.84	1.03	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6	5.6	0.0	2.0	46.0		226.1	0.1	0.1	7.2	0.1	0.2
Delay (s)	58.3	30.3	7.2	72.4	91.7		287.8	48.4	48.8	72.4	56.9	36.0
Level of Service	E	C	A	E	F		F	D	D	E	E	D
Approach Delay (s)		30.3			91.4			228.0			47.3	
Approach LOS		C			F			F			D	

Intersection Summary			
HCM Average Control Delay	79.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	90.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	1777	840	214	1903	128	290	30	36	151	70	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		0.94	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5037		4990	1710		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5037		4990	1710		1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	133	1974	933	238	2114	142	322	33	40	168	78	444
RTOR Reduction (vph)	0	0	214	0	5	0	0	35	0	0	0	4
Lane Group Flow (vph)	133	1974	719	238	2251	0	322	38	0	168	78	440
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	21.5	77.2	91.4	12.9	69.0		14.2	18.7		16.5	21.0	42.5
Effective Green, g (s)	21.5	77.2	91.4	12.9	69.0		14.2	18.7		16.5	21.0	42.5
Actuated g/C Ratio	0.15	0.53	0.63	0.09	0.48		0.10	0.13		0.11	0.14	0.29
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	262	2707	998	305	2397		489	221		201	270	464
v/s Ratio Prot	0.08	0.39	0.07	0.07	c0.45		0.06	0.02		c0.09	0.04	c0.14
v/s Ratio Perm			0.38									0.14
v/c Ratio	0.51	0.73	0.72	0.78	0.94		0.66	0.17		0.84	0.29	0.95
Uniform Delay, d1	56.9	25.9	18.2	64.7	36.0		63.1	56.3		62.9	55.3	50.2
Progression Factor	1.02	0.88	1.14	1.29	0.42		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2	0.2	9.3	7.4		2.4	0.1		23.9	0.2	28.4
Delay (s)	58.1	23.0	21.0	92.5	22.4		65.5	56.4		86.8	55.6	78.6
Level of Service	E	C	C	F	C		E	E		F	E	E
Approach Delay (s)		23.9			29.1			63.8			78.0	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM Average Control Delay	33.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	14.4
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	2489	300	29	1614	193	680	70	157	75	40	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		0.94	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5004		4990	1670		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5004		4990	1670		1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	278	2766	333	32	1793	214	756	78	174	83	44	222
RTOR Reduction (vph)	0	0	61	0	10	0	0	63	0	0	0	1
Lane Group Flow (vph)	278	2766	272	32	1997	0	756	189	0	83	44	221
Turn Type	Prot		pm+ov	Prot			Prot			Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	29.9	83.5	103.4	2.8	56.8		19.9	28.0		11.0	19.1	49.0
Effective Green, g (s)	29.9	83.5	103.4	2.8	56.8		19.9	28.0		11.0	19.1	49.0
Actuated g/C Ratio	0.21	0.58	0.71	0.02	0.39		0.14	0.19		0.08	0.13	0.34
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	365	2928	1129	66	1960		685	322		134	245	535
v/s Ratio Prot	c0.16	c0.54	0.03	0.01	c0.40		c0.15	c0.11		0.05	0.02	0.09
v/s Ratio Perm			0.14									0.05
v/c Ratio	0.76	0.94	0.24	0.48	1.02		1.10	0.59		0.62	0.18	0.41
Uniform Delay, d1	54.2	28.6	7.2	70.4	44.1		62.5	53.2		65.0	56.0	36.9
Progression Factor	1.08	0.84	1.05	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.7	4.9	0.0	2.0	25.2		66.3	1.8		5.9	0.1	0.2
Delay (s)	63.3	29.0	7.6	72.4	69.3		128.9	55.0		70.8	56.1	37.1
Level of Service	E	C	A	E	E		F	E		E	E	D
Approach Delay (s)		29.7			69.4			110.4			47.5	
Approach LOS		C			E			F			D	

Intersection Summary			
HCM Average Control Delay	54.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	20.4
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	120	1777	840	214	1903	128	290	30	36	151	70	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5037		3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5037		3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	133	1974	933	238	2114	142	322	33	40	168	78	444
RTOR Reduction (vph)	0	0	256	0	5	0	0	0	35	0	0	3
Lane Group Flow (vph)	133	1974	677	238	2251	0	322	33	5	168	78	441
Turn Type	Prot		pm+ov	Prot			Prot		Perm	Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2						8			4
Actuated Green, G (s)	22.2	63.7	79.3	24.6	66.5		15.6	17.7	17.7	19.3	21.4	43.6
Effective Green, g (s)	22.2	63.7	79.3	24.6	66.5		15.6	17.7	17.7	19.3	21.4	43.6
Actuated g/C Ratio	0.15	0.44	0.55	0.17	0.46		0.11	0.12	0.12	0.13	0.15	0.30
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.9	4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	271	2234	866	300	2310		369	227	193	236	275	476
v/s Ratio Prot	0.08	0.39	0.08	0.13	c0.45		c0.09	0.02		0.09	0.04	c0.14
v/s Ratio Perm			0.34						0.00			0.14
v/c Ratio	0.49	0.88	0.78	0.79	0.97		0.87	0.15	0.03	0.71	0.28	0.93
Uniform Delay, d1	56.2	37.3	26.0	57.8	38.4		63.7	56.9	56.1	60.2	55.0	49.1
Progression Factor	0.99	0.89	1.00	1.41	0.44		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.5	0.4	10.4	11.8		19.2	0.1	0.0	8.2	0.2	23.6
Delay (s)	55.6	33.8	26.5	91.5	28.6		82.9	57.0	56.1	68.3	55.2	72.7
Level of Service	E	C	C	F	C		F	E	E	E	E	E
Approach Delay (s)		32.5			34.6			78.0			69.7	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM Average Control Delay	39.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	13.2
Intersection Capacity Utilization	84.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	250	2489	300	29	1614	193	680	70	157	75	40	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9	4.0	4.4	4.9	4.4
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91		0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	1770	5004		3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	1770	5004		3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	278	2766	333	32	1793	214	756	78	174	83	44	222
RTOR Reduction (vph)	0	0	62	0	10	0	0	0	174	0	0	1
Lane Group Flow (vph)	278	2766	271	32	1997	0	756	78	0	83	44	221
Turn Type	Prot		pm+ov	Prot			Prot		NA	Prot		pm+ov
Protected Phases	5	2	3	1	6		3	8		7	4	5
Permitted Phases			2									4
Actuated Green, G (s)	29.9	83.5	102.7	4.4	58.4		19.2	26.4	0.0	11.0	18.2	48.1
Effective Green, g (s)	29.9	83.5	102.7	4.4	58.4		19.2	26.4	0.0	11.0	18.2	48.1
Actuated g/C Ratio	0.21	0.58	0.71	0.03	0.40		0.13	0.18	0.00	0.08	0.13	0.33
Clearance Time (s)	4.4	6.0	4.4	4.4	5.6		4.4	4.9		4.4	4.9	4.4
Vehicle Extension (s)	2.0	5.0	2.0	2.0	5.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	365	2928	1121	54	2015		455	339	0	134	234	525
v/s Ratio Prot	c0.16	c0.54	0.03	0.02	c0.40		c0.22	0.04		0.05	0.02	c0.09
v/s Ratio Perm			0.14									0.05
v/c Ratio	0.76	0.94	0.24	0.59	0.99		1.66	0.23	0.00	0.62	0.19	0.42
Uniform Delay, d1	54.2	28.6	7.4	69.4	43.0		62.9	50.6	72.5	65.0	56.8	37.6
Progression Factor	1.08	0.84	1.06	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.7	4.9	0.0	11.1	18.1		307.3	0.1	0.0	5.9	0.1	0.2
Delay (s)	63.4	28.8	7.9	80.5	61.1		370.2	50.8	72.5	70.8	56.9	37.8
Level of Service	E	C	A	F	E		F	D	E	E	E	D
Approach Delay (s)		29.6			61.4			294.1			48.1	
Approach LOS		C			E			F			D	

Intersection Summary			
HCM Average Control Delay	79.5	HCM Level of Service	E
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	24.8
Intersection Capacity Utilization	90.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX J

CONCEPTUAL IMPROVEMENT PLANS

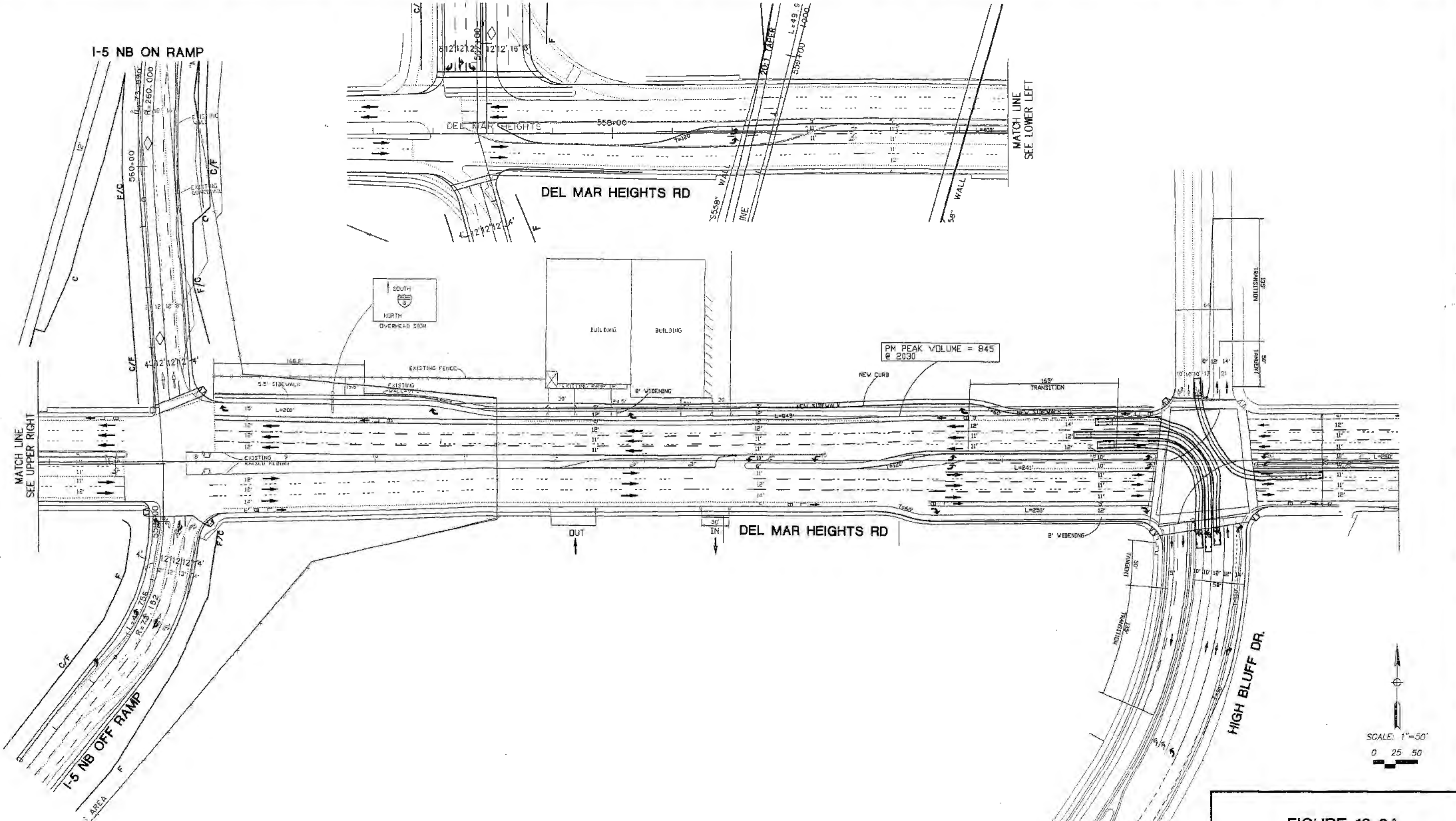


FIGURE 19-2A

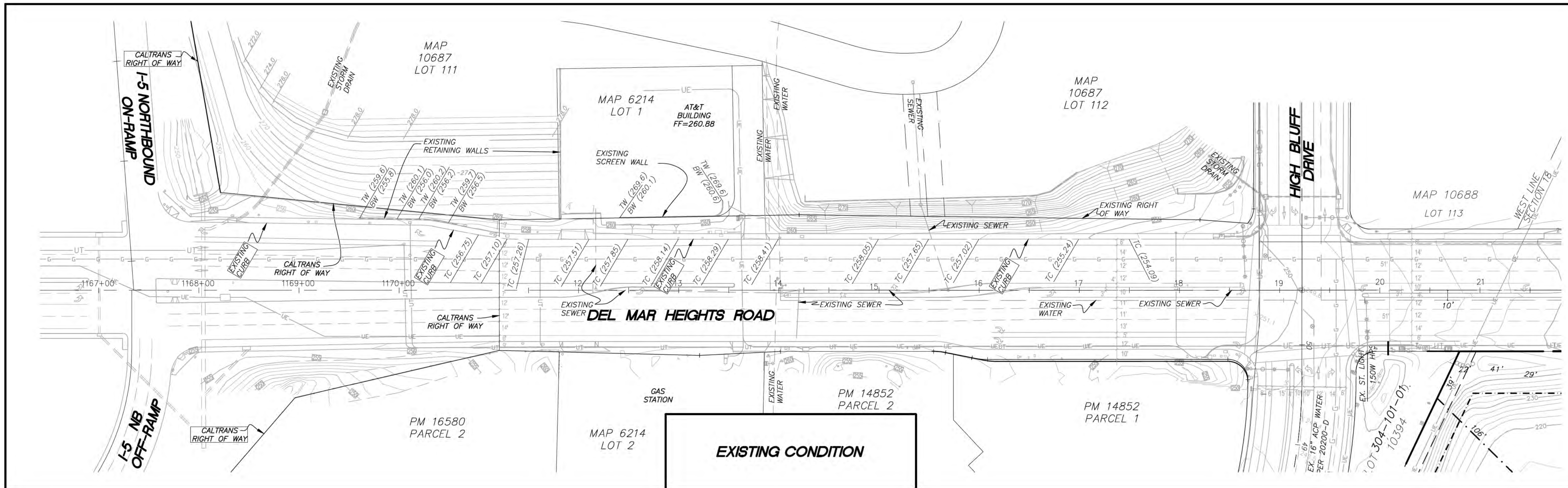
CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET OF SHEETS

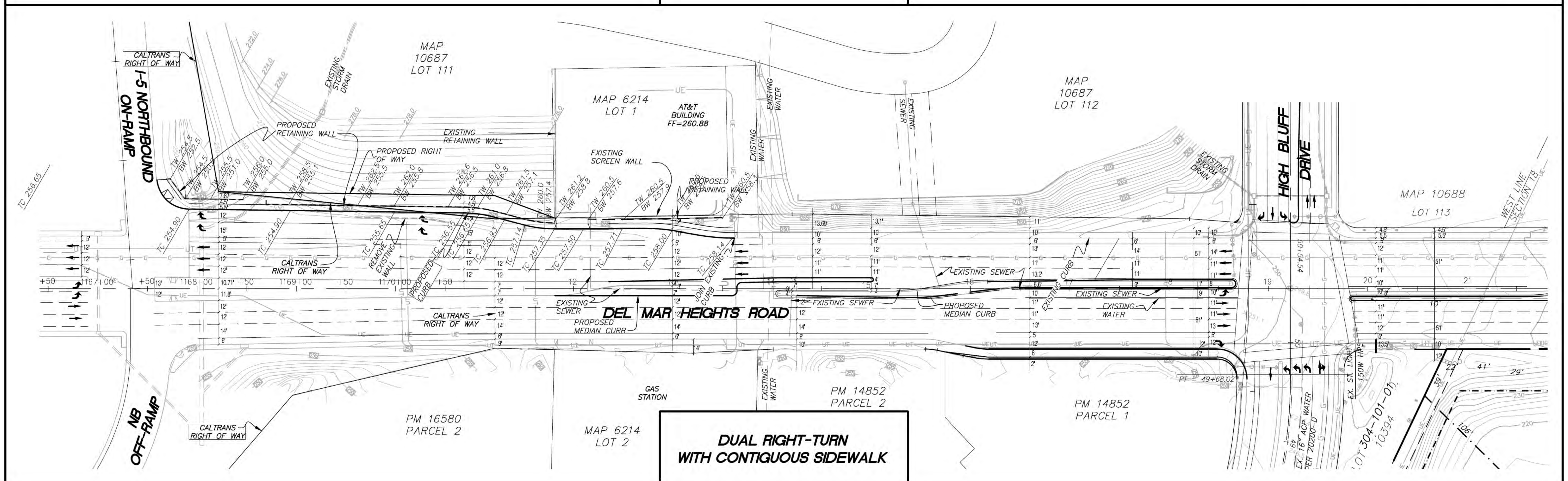
USAI

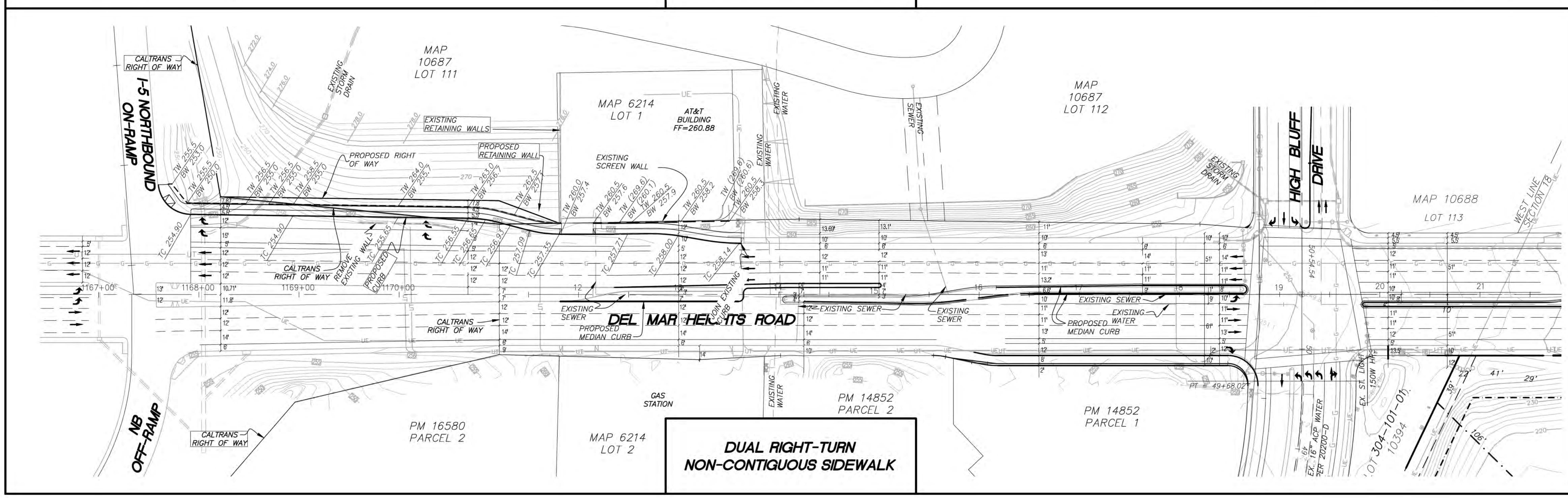
URBAN SYSTEMS ASSOCIATES, INC.
4540 KEARNY VILLA ROAD, SUITE 106
SAN DIEGO, CA 92123, (619) 560-4911

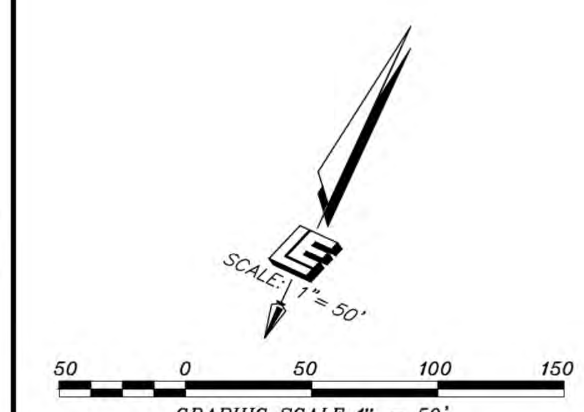
CONCEPTUAL LAYOUT
FOR DISCUSSION PURPOSES ONLY
NOT BASED ON A SURVEY

NOTE: PRELIMINARY OPINION OF COST BASED ON CONCEPTUAL PLANS WHICH ARE SUBJECT TO SIGNIFICANT CHANGE BASED ON AGENCY REVIEW AND APPROVAL.









Prepared By:

Name: Leppert Engineering Corporation

Address: 5190 Governor Drive, Suite 205
San Diego, CA 92122

Phone #: (858) 597-2001
Fax #: (858) 597-2009

Project Address:
Southwest Corner Of Intersection At
Del Mar Heights Road & El Camino Real.

Project Name:
ONE PASEO

Sheet Title:
Offsite Del Mar Heights Road W/ Dual Right

Revision 14:
Revision 13:
Revision 12:
Revision 11:
Revision 10:
Revision 9:
Revision 8:
Revision 7:
Revision 6:
Revision 5:
Revision 4:
Revision 3:
Revision 2: 10/19/15 1ST AMEND SUBMIT
Revision 1: 02/26/15 CC APPROVAL

Original:: 12/21/2009

SHEET C-13 OF 13

DEP#

Leppert Engineering
CORPORATION
5190 Governor Drive, Suite 205, San Diego, Ca. 92122-2848
Phone: (858) 597-2001 Fax: (858) 597-2009

Del Mar Heights Road: Shell Driveway to High Bluff Drive
Existing Condition

DEL MAR HEIGHTS ROAD: SHELL DRIVEWAY TO HIGH BLUFF DRIVE
RECOMMENDED STRIPING AND RAISED MEDIAN MODIFICATION (CONCEPTUAL)

APPENDIX K

PHASE I CONSTRUCTION TRIP GENERATION TABLE, APPENDIX O, ORIGINAL TRAFFIC STUDY

ATTACHMENT 6

One Paseo Trip Generation Table

Construction Traffic

PHASE 1

Purpose	Number	Auto Equivalency	Equivalent Autos	Trip	ADT	AM Peak Hour					PM Peak Hour				
						%*	#	In : Out	In	Out	%*	#	In : Out	In	Out
Employees	300 Autos	N/A	300	2 /Auto	600	4%	24	9 : 1	22	2	4%	24	2 : 8	5	19
Material Deliveries	25 Trucks	2.5	62.5	2 /Auto	125	9%	11	4 : 6	5	7	8%	10	5 : 5	5	5
Truck Imports/Exports	210 Trucks	2.5	525	2 /Auto	1,050	9%	95	4 : 6	38	57	8%	84	5 : 5	42	42
TOTAL					1,775		130		64	66		118		52	66

Notes:

Passenger-Car equivalents for Trucks is 2.5 per Exhibit 21-9 in the Highway Capacity Manual 2000

Typical Work Hours 7AM to 3:30PM.

For Employee Peak Hour In/Out Ratios, a 4% AM and PM peak is assumed based on the AM peak counts beginning at 7:30AM and the majority of employee shifts ending at 3:30PM, which is prior to the PM peak counts beginning at 5:00PM.

For Material Deliveries and Truck Imports/Exports, the Truck Terminal land use peak hour splits were used based on the City of San Diego Trip Generation Manual, May 2003.

APPENDIX L

FAIR SHARE CALCULATIONS FROM THE APPROVED REPORT

ONE PASEO

Fair Share Contribution Calculations

16-May-11

El Camino Real / SR-56 Eastbound on-ramp:

$$\frac{\text{Project Only}}{\text{Year 2030+P - Existing}} \Rightarrow \frac{134}{10{,}331 - 6{,}568} \Rightarrow \frac{134}{3{,}763} \Rightarrow \boxed{0.035 = 3.5\%}$$

Via de la Valle (San Andres Drive to El Camino Real-West):

$$\frac{\text{Project Only}}{\text{Year 2030+P - Existing}} \Rightarrow \frac{539}{33639 - 24{,}400} \Rightarrow \frac{539}{9{,}239} \Rightarrow 0.058 = 5.8\%$$

Fair Share Cost: $15,800,000 x 5.8% = $916,400

Note: The City of San Diego calculated the fair share as: 539 ADT x $5,692.61 per ADT = $3,068,317

Therefore, the fair share percentage shows 19.4%

$$\frac{\$3{,}068{,}317}{15{,}800{,}000} \Rightarrow \boxed{= 19.4\%}$$

I-5 Southbound (Loop) on-ramp / Del Mar Heights Road:

AM (Demand-veh/hr)

$$\frac{\text{Project Only}}{\text{Year 2030+P - Existing}} \Rightarrow \frac{45}{660 - 406} \Rightarrow \frac{45}{254} \Rightarrow 0.177 = 17.7\%$$

PM (Demand-veh/hr)

$$\frac{\text{Project Only}}{\text{Year 2030+P - Existing}} \Rightarrow \frac{151}{551 - 242} \Rightarrow \frac{151}{309} \Rightarrow 0.488 = 48.8\%$$

Weighted Average (AM & PM)

$$\Rightarrow \frac{45 + 151}{254 - 309} \Rightarrow \frac{196}{563} \Rightarrow \boxed{0.348 = 34.8\%}$$

606 South Olive Street, Suite 1100
Los Angeles, CA 90014

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www.walkerparking.com

February 24, 2016

Renee Mezo
City of San Diego Development Services
122 First Avenue, MS 501
San Diego, CA 92101-4155

RE: New One Paseo – San Diego, California
Shared Parking Analysis
Walker Project No. 37-8525.00

Dear Ms. Mezo,

Walker Parking Consultants ("Walker") is pleased to submit a Shared Parking Analysis for the New One Paseo Project ("Project") in the Carmel Valley Community Planning Area of the City of San Diego. This analysis updates an earlier analysis completed for the One Paseo development (referred to as the Originally Proposed Project). This analysis evaluates a development proposal which has been reduced in scale from the Originally Proposed Project. The reduced scale development is referred to as the New One Paseo Project. The purpose of this report is to document the projected typical peak parking demand of the New One Paseo Project. The report has been prepared to closely align with the format and style used for the Originally Proposed Project, and is organized as follows:

I. Project Understanding and Purpose of Analysis
II. Report Highlights
III. Urban Land Institute (ULI) Shared Parking Analysis
IV. Evaluation of City of San Diego Parking Regulations
V. Conclusions and Recommendations

The summary of the highlights of this report are on page 5. Various items are also included within the Attachments after the body of the report including several pages from *Shared Parking, 2nd Edition, 2005,* the landmark study and model on which much of the data in this report is based.

I. PROJECT UNDERSTANDING AND PURPOSE OF ANALYSIS

The New One Paseo Project consists of a mixed-use plan which will ultimately contain approximately 375,871 square feet ("SF") of office, retail, and restaurant ("commercial uses") as well as 608 residential units. The mix of land uses planned for the site lends itself to the use of shared parking.

Both the City and Applicant wish to determine the appropriate number of parking spaces that should be built for the New One Paseo Project. The objective is to properly serve future residents, tenants and customers. In order to meet this objective, a Shared Parking Model has been prepared which projects parking demand based on a number of factors (proposed program data, site conditions, market demand, current information from the Urban Land Institute, focused studies and the Parking Regulations of the City's Land Development Code). Walker developed the Shared Parking Model in conjunction with the Urban Land Institute's most recent research on parking demand, as coordinated by the Urban Land Institute and published in Shared Parking, 2nd Edition, 2005. A conservative adjustment included in the preparation of this model was to dedicate or reserve residents' parking rather than share it with other uses, although doing so is permitted within the ULI Model and City of San Diego LDC.

Finally, within this report, the number of spaces for the Project to comply with the shared parking section of the City's Land Development Code (LDC) Section 142.0545 has been calculated.

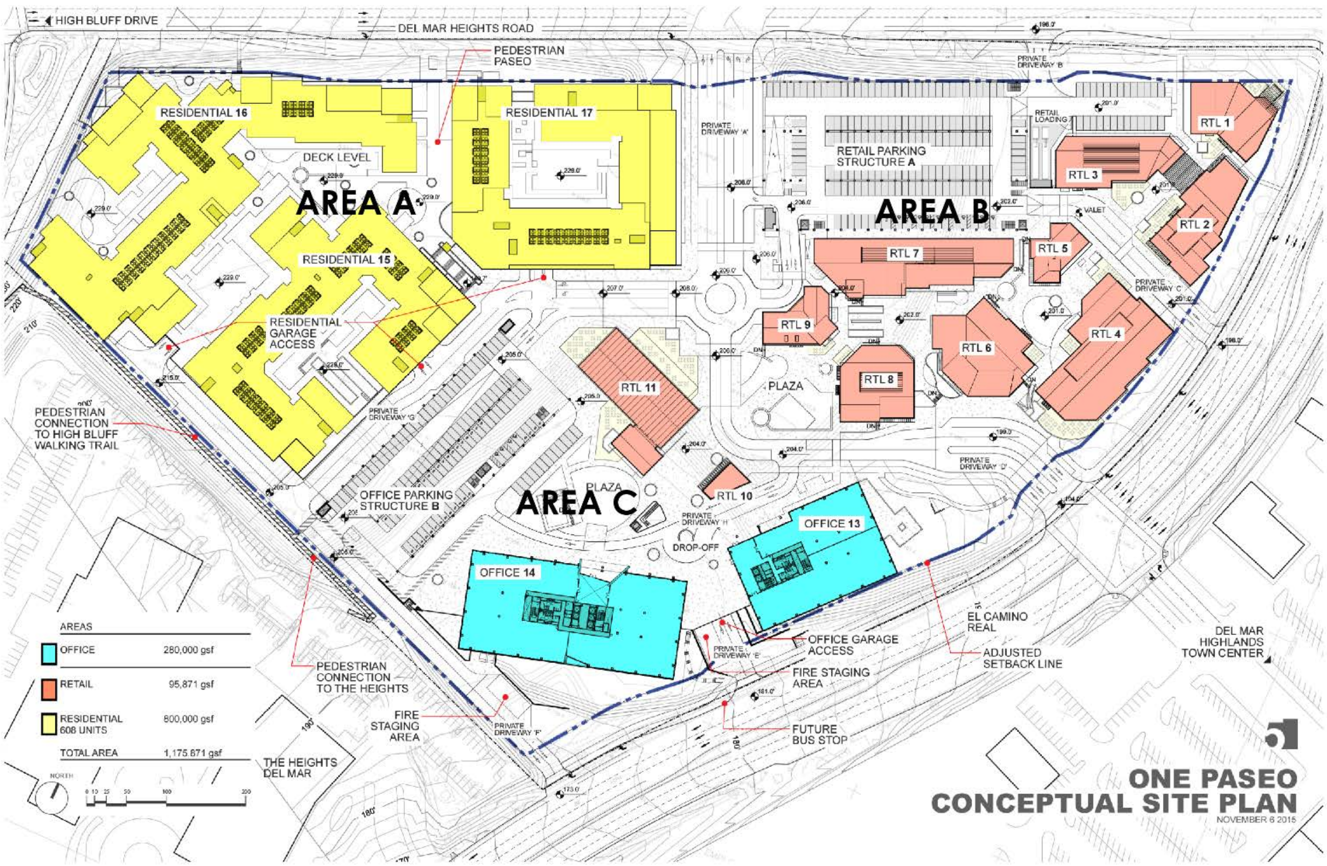
PROJECT LOCATION AND DESCRIPTION

The Project will be constructed at the southwest corner of the intersection of Del Mar Heights Road and El Camino Real in the Carmel Valley area of San Diego, CA (indicated in Figure 1). Walker has performed a Shared Parking Analysis for the proposed development in order to accurately assess the future parking demand for the site, which incorporates retail, residential, and office uses. The development summary is provided in Figure 2.

Figure 1: Proposed Project Location

Source: Image: Google Earth Professional, 2015

Figure 2: Proposed Project Site Plan and Development Summary



Land Use	Gross Square Footage	Number of Units
Retail	47,711	-
Restaurant: Fine/Casual Dining	27,315	-
Restaurant: Fast Casual/Fast Food	20,845	-
Residential	800,000	608
Office	280,000	-
Total	**1,175,871**	**608**

Source: Kilroy Realty Corporation, 2015

II. HIGHLIGHTS OF THE SHARED PARKING REPORT

The highlights of this analysis are presented in Table H1, which shows the peak demand for parking spaces. The peak demand occurs on a weekday afternoon. Table H2 summarizes the peak demand on weekends, which is significantly lower than the weekday peak. Our key findings include the following:

- The typical peak parking demand projection for the New One Paseo Project is 2,587± spaces and would occur on a weekday in December. Given the planned supply of 2,747± spaces, a surplus at peak of 160± parking spaces is projected within the parking system.[1] The New One Paseo Project is providing approximately 5% more parking spaces than the projected typical peak parking demand.
- Parking demand in the evenings and on weekends will be dramatically lower than that projected for the middle of the business day, with a projected peak of 2,066± spaces on weekday evenings, and 1,891± spaces on weekend evenings. The result is a projected parking space surplus during periods of peak weekend parking demand that is more than 600 spaces.
- The typical weekday peak demand for the entire Project will likely occur infrequently, during one month of the year, and for approximately one hour during busy days. The peak demand for the next busiest month is projected to be 2,518± spaces, 69± spaces lower than the December peak and occurring in May.
- Using the City of San Diego's Shared Parking Code regulations would result in the need for 2,850 spaces for weekdays. It should be noted that, given the code's reliance on a previous version of the ULI shared parking publication and an incomplete methodology, Walker does not recommend that this number of spaces be constructed. After a careful review, Walker attributes the code regulations being higher than the ULI projections to several factors including some higher base ratios than those used in the ULI Model as well as the lack of a seasonal adjustment within the City's calculations, which can play an important role in shared parking demand calculations. As a result, in the Code calculation, the peak demand for each land use for each month stacks upon one another rather than sharing parking in a complementary manner. A comparison of the factors used in the City's code (LDC) and the ULI Shared Parking Model are shown in Attachment B to the report.

[1] The total parking supply of 2,747 spaces does not include an additional 8 parking spaces along the internal private drives in Area A which the Applicant has shown will be available.

Table H1: Summary of Peak Parking Demand and Requirements for All Scenarios – Weekday

Number of Parking Spaces Per:	Demand	Planned Supply[2]	Difference
Walker/ULI Shared Parking Model	2,587	2,747	160
City of San Diego Shared Parking Requirement[1]	2,850	2,747	(103)

1 Per Article 2, Section142.0545 of the City of San Diego Land Development Code.

2 Does not include 8 parking spaces in Area A along the private drive.

The overall peaks in expected parking demand are driven by the high demand for office (employee) parking. This results in a significant parking surplus on weekends, when most office employees are typically not present. We show the peak demand numbers for weekends in the following table.

Table H2: Summary of Peak Parking Demand and Requirements for All Scenarios – Weekend

Number of Parking Spaces Per:	Demand	Planned Supply[2]	Difference
Walker/ULI Shared Parking Model	1,891	2,747	856
City of San Diego Shared Parking Requirement[1]	2,042	2,747	705

1 Per Article 2, Section 142.0545 of the City of San Diego Land Development Code.

2 Does not include 8 spaces in Area A along the private drive.

Each of the projections assumes shared parking among the different land uses on the site, a shared pool of office parking, but no sharing of residential resident/guest parking with the rest of the site. The implementation of a parking management plan is recommended in order to efficiently distribute parking demand throughout the site.

For the purpose of meeting parking demand during the peak periods of the year without oversupplying parking spaces, it is recommended that the Applicant build to the projections of the ULI Model. Walker recognizes that the City's shared parking requirement projects a need for a higher number of spaces than the ULI Model projects for parking demand. However, based on ULI and Walker research, and the resulting model, the New One Paseo Project will not experience a need for more than the 2,587± spaces for other than highly unusual and unforeseen occasions.[2] In addition, with regard to the parking demand projections contained within this document, the following should be noted:

- The assumptions used in our model are conservative. Very little patronage of the

[2] This is one reason that an effective supply factor is built in to the recommended number of spaces. The effective supply factor, a cushion of additional spaces, is provided in part to accommodate unexpected increases in parking demand although under these conditions the parking system may not operate at a level of service comparable to a busy or peak period. Per parking industry standards, a parking system should not be "sized" for unusual or unforeseen events as the result would be parking spaces that remain vacant for all but a few hours each year.

businesses on site by the office employees and residents is assumed when in fact such patronage is likely to occur and result in fewer customers of these businesses requiring parking spaces. Assuming almost 1,000 people working and living on the site during peak parking conditions, compared with the overall parking demand and patronage of businesses, we have conservatively assumed in this analysis that approximately 5% of the patronage of the retail and non-fast food restaurant uses will be accounted for by other employees and residents of other on-site land.

- Virtually no commuting to the site other than by single occupancy vehicle was assumed.
- Spikes in the demand for retail parking, such as "Black Friday" or the days before Christmas are likely to occur when office parking demand is low and parking spaces typically used by office employees will be available to accommodate the parking demand generated by retail/food uses.
- Parking management policies and technology for such a large parking supply will likely reduce the number of spaces needed as such measures lead parkers more quickly to available spaces and therefore tend to result in a need for fewer spaces.
- Although it is a shared parking system, parking supply within the site is well distributed according to where the demand for parking on the site will be generated. During the overall peak for the site (midday on a weekday), roughly all of the parking demand for each area can be accommodated within that area. When the demand for parking on Area B increases in the evenings and on weekends, more than 80% of the parking demand generated on these areas can be accommodated within the individual areas. Because the employee component of parking demand for retail or restaurant space typically represents roughly 20% of that demand, parking can be managed such that the employees will park in Area C. The location of each Area of the project is shown on Figure 2 on page 4.

III. URBAN LAND INSTITUTE SHARED PARKING ANALYSIS

The principles supporting this analysis stem from the concept of shared parking, an accepted practice widely used in mixed use developments and commercial districts. The Urban Land Institute first published *Shared Parking* in 1983, upon which the LDC Shared Parking is based. This publication explains the concept of shared parking and describes the use of a model to forecast peak parking conditions for mixed-use developments, and/or urban settings. Walker contributed to that original publication along with a number of firms, organizations and individuals in the parking field. Walker then led the team that researched and wrote *Shared Parking, 2nd Edition*, published in 2005. The City's Land Development Code section on shared parking is based on a previous version of the ULI shared parking publication.

ULI SHARED PARKING METHODOLOGY

Shared parking is possible where parking spaces can be used to serve two or more individual land uses without conflict or encroachment. One of the fundamental principles of downtown planning from the earliest days of the automobile has always been to share parking resources rather than to have each use or building have its own parking. The resurgence of many central cities resulting from the addition of vibrant office, residential, retail, and entertainment developments continues to rely heavily on shared parking for economic viability. In addition, mixed-use projects in many different settings have benefited from shared parking.

The key goal of a shared parking analysis is to find the balance between providing adequate parking to support a development from a commercial and operational standpoint, while minimizing the negative aspects of excessive land area or resources devoted to parking. In general, a shared parking analysis considers the types, quantities and user groups of land uses for a development, as well as site- and market-specific characteristics. The ultimate goal of a shared parking analysis is to find the peak period, or design day condition; according to ULI's Shared Parking, 2nd Edition, "A design day or design hour is one that recurs frequently enough to justify providing spaces for that level of parking activity."

Shared parking offers numerous benefits to a community at large, not the least of which is the environmental benefit of significantly reducing the amount of parking provided to serve commercial development.

Attachment A includes 13 case studies of shared parking in similarly sized mixed-use projects and the results of a study that validated the success of shared parking policies.

Walker's Shared Parking Model is based on the Urban Land Institute and International Council of Shopping Center's *Shared Parking*[3] publication. Walker led a team of consultants in writing the updated *Shared Parking Second Edition*, which was published in November of 2005, and features the most up-to-date parking demand model. The model is designed to project the

[3] *Shared Parking* (Second Edition), 2005, The Urban Land Institute, Washington, D.C.

parking needs of a mixed-use development from 6:00 a.m. to 12:00 midnight on a typical weekday and a Saturday for every month of the year.

Attachment C contains select pages from shared parking, 2nd edition.

ULI SHARED PARKING ANALYSIS EVALUATION – PROPOSED NEW ONE PASEO PROJECT

Within this section of the report Walker will apply the methodology outlined above to project the peak parking demand for the proposed Project. The parking demand projections are based on ratios, factors and adjustments found in the ULI shared parking model, developed in conjunction with Walker, which were then adjusted to take into account site-specific conditions.

BASE PARKING RATIOS

Base parking ratios are used to determine the parking requirements for a development site as if each component were a free-standing entity. Table 1 shows the base parking demand ratios used for this shared parking analysis.

Table 1: Base Parking Demand Ratios

	Weekday		Weekend			
Land Use	**Customer/ Guest**	**Employee/ Resident**	**Customer/ Guest**	**Employee/ Resident**	**Unit**	**Source**
Retail	2.90	0.70	3.20	0.80	/ksf GLA	1
Restaurant: Fine/Casual Dining	15.25	2.75	17.00	3.00	/ksf GLA	2
Restaurant: Fast Casual/Fast Food	12.75	2.25	12.00	2.00	/ksf GLA	2
Residential						
Studio Efficiency (>400 sqft)	Included in Resident Total	1.50	Included in Resident Total	1.50	/unit	3
1 bedroom		1.50		1.50	/unit	3
2 bedroom		2.00		2.00	/unit	3
>3 bedroom		2.25		2.25	/unit	3
Office	0.23	2.90	0.02	0.29	/ksf GFA	2

Source References:

1. Parking Requirements for Shopping Centers, Second Edition. Washington DC: ULI-The Urban Land Institute, 1999.
2. Parking Generation, Fourth Edition. Washington DC: Institute of Transportation Engineers, 2010.
3. San Diego Municipal Code

Source: Walker Parking Consultants; 2015

The source of the base parking ratios for most land uses come directly from the Shared Parking, 2nd Edition and Parking Generation, 4th Edition publications. The sources for those ratios not specifically identified in the publication are described below.

Residential Parking
The Applicant is planning on providing the exact amount of residential parking required by City code. All required resident and residential guest parking will be reserved for the exclusive use of residents and their guests. The parking demand ratios for residents are based on parking requirements in the City of San Diego Municipal Code, Table 142.05C. Since the residential parking is reserved, for the purpose of the shared parking analysis, the residential parking supply is assumed to be 'occupied' 24/7.

ADJUSTMENTS FOR SITE SPECIFIC CHARACTERISTICS

The shared parking model utilizes base demand ratios that are largely consistent with the Urban Land Institute provided ratios; it should be noted that the ULI Model and Shared Parking publication call for adjustments to the model by the user to take into account site specific conditions where necessary. These ratios are adjusted by three factors to account for shared parking in order to take account of the specific characteristics of the project under study; driving and non-captive ratios and presence factors, which are discussed in the following sections.

DRIVE RATIO (MODE SPLIT)

The drive ratio represents a reduction in anticipated spaces to account for mass transit use, carpooling, drop offs, walking from locations outside of the development site, etc. The Project site is outside the San Diego Transit Overlay Zones, and a review of available transit shows no particular concentration of transit service in the area, so no changes have been made to the base drive ratios in this analysis.

A review of the mode share data for people working in the census tracts in and around Carmel Valley area suggested a single occupancy vehicle share among commuters of 90%. However, as noted previously for the purposes of the model a 100% drive-alone mode split is conservatively assumed, and therefore there is no reduction for mode split.

NON-CAPTIVE RATIO

In the shared parking analysis, the term "captive market" reflects the adjustment of parking needs and vehicular trip generation rates due to the interaction among uses in an area. Traditionally, the non-captive adjustment is used to fine-tune the parking needs of restaurants and retail patronized by employees of adjacent office buildings, or other persons, generally long-term parkers, already counted as being parked for the day.

Because the model projects the demand for parking that is generated, the inverse of a captive factor or non-captive ratio is used. This adjustment accounts for the percentage of parkers who are not already counted as being parked. Typically, a primary land use (retail, office or residential) comprises the longest parking durations of the vehicles that park at a given development. Because captive market effects typically reduce the parking needs, the factor employed to adjust the parking ratio is actually the percentage of customers who are not considered captive, or the non-captive ratio. For example, if 10% of the patrons of a food court are expected to be employees or customers of other land-uses, the non-captive ratio is 90%.

Based on Shared Parking research and observations, on-site employees will frequent the restaurants due to relative proximity and concomitant convenience. This statistic is incorporated into the ULI Shared Parking Model. Specifically, it is assumed that approximately 50% of the patronage to the quick service restaurants will be from patrons of other areas within the development, or employees of retail and office space patronizing these restaurants.[4]

The New One Paseo Project has significant office and residential components. Assuming approximately 1,000 people working and living on the site during peak parking conditions,[5] compared with the overall parking demand and patronage of businesses, we have conservatively assumed in this analysis that approximately 5% of the patronage of the retail and non-fast food restaurant uses will be accounted for by other employees and residents of other on-site land. The captive adjustments were based on the methodology outlined and recommended in Shared Parking (both 1st and 2nd editions) for evaluating the relative demand generation of land uses on the site that generate captive markets and those that benefit from captive markets. Captive adjustments of 5% of retail and restaurant demand is extremely conservative based on the large number of people who will work and live on the site. Table 2 details the weekday and weekend non-captive factors used in the parking demand analysis.

Table 2: Non-captive Ratios

	Weekday		Weekend	
Land Use	**Daytime**	**Evening**	**Daytime**	**Evening**
Retail	95%	100%	100%	100%
Employee	100%	100%	100%	100%
Restaurant: Fine/Casual Dining	95%	95%	95%	95%
Employee	100%	100%	100%	100%
Restaurant: Fast Casual/Fast Food	50%	75%	50%	75%
Employee	100%	100%	100%	100%
Residential	100%	100%	100%	100%
Office	100%	100%	100%	100%
Employee	100%	100%	100%	100%

Source: Walker Parking Consultants; 2015

[4] Based on the research and observations of the project team, ULI's *Shared Parking* uses 50% as the default non-captive ratio for fast food uses in mixed-use centers regardless of the size of the mixed-use center. Experience and common sense would suggest an even lower non-captive ratio for larger centers due a larger number of people working, living and visiting, who would only access these restaurants on foot.

[5] The model projects 813 office employee vehicles and 33 retail employee vehicles on the site during the peak period of parking demand, and if we assume that in the 608 residential units 0.25 residents per unit (on a weekday) will be home, we can assume 998 people who live or work on the site on weekdays during the day. This figure does not include restaurant employees who often eat on-site.

Very little patronage of the businesses on site by the office employees and residents is assumed when in fact such patronage is likely to occur and result in fewer customers of these businesses requiring parking spaces. For example, the Walker/ULI Model projects that during the peak hour there will be 813 office employee vehicles and 33 non-restaurant retail employee vehicles parked on site, but only five percent of the site's retail location's patrons will be employees or residents that are already on site. Similar "non-captive" ratios are used in the model (See discussion in Attachment C: Select Pages from Shared Parking, 2nd Edition).

PRESENCE FACTORS

Presence factors are expressed as a percentage of potential demand modified for time of day and time of year. Considering that parking demand for each land use may peak at different times generally means that fewer parking spaces are needed for the combination of land uses in a project than would be required if each land use were considered separately.

TIME OF DAY ADJUSTMENT

The parking demand for any given land use varies throughout the day. Restaurants, for example, typically show peaks around the lunch hour and a larger peak during the evening. The ULI/Walker Shared Parking Model accounts for this variation in demand through adjustment of presence factors in the overall parking demand. These hourly adjustments are based on hourly parking accumulation data with the same source as the base parking ratios. A peak hour parking demand is observed, and a ratio results, but hourly counts were also performed which are presented as a percentage of that peak period and show how the land use generates parking throughout the day.

The model evaluates parking demand for each land use from 6:00 AM to 12:00 midnight on weekdays and weekends for every month of the year. An additional analysis of the last week of December is included and considered as the "thirteenth month." Special analysis is required during this unique period due to different parking demand patterns typical of the first three weeks of December (See tables in Attachment C: Select Pages from Shared Parking, 2nd Edition).

TIME OF YEAR ADJUSTMENT

Seasonality usually has varied effects on the parking generation at mixed-use sites because land uses and quantity mixes vary from one development to the next. Both restaurant and retail parking demand exhibit strong seasonal peaks, so many mixed-use developments with a strong retail component peak based on the combination of these two uses. Unless there is specific market data to support changes, the default planning ratios supplied in the ULI/Walker Shared Parking Model are typically used. An example of time of year adjustments includes the increased business of health clubs in January or greater movie attendance in the "thirteenth month," in the last week of December. (See tables in Attachment C: Select Pages from Shared Parking, 2nd Edition).

No adjustment was made to the time of day and year presence factors as supplied in the ULI Model.

EFFECTIVE SUPPLY

It is an accepted principle in the parking industry that a parking facility or system cannot operate efficiently when it is completely filled to capacity. Some empty spaces should be available at all times to provide for more efficient circulation, and to ensure that motorists do not spend excessive time looking for the one or two remaining spaces in a large facility or area. It is also recognized that if a parking system is planned to meet demand exactly, there will inevitably be parking shortages due to misparked vehicles, repairs or other obstructions, and minor construction. Therefore, in evaluating the ability of a parking supply to meet demand, and in planning the size of future parking facilities, we use the "effective" supply rather than the full supply.

The effective supply is the supply that is realistically usable by patrons or employees, usually 5-10% smaller than the actual "full" supply depending on the space type and for whom those spaces are designed to serve. For example in facilities dominated by employees, the effective supply factor is lower as drivers are familiar with the facility by virtue of parking in it most or all weekdays, whereas a facility at a retail center would have a higher effective supply factor due to a higher proportion of drivers who may not be familiar with the facility. Our shared parking model projections are for the number of spaces that are necessary to accommodate demand and the effective supply cushion is included within the projections.

The ULI/Walker Shared Parking Model projections are for the number of spaces that are necessary to accommodate demand; the effective supply cushion is built in (See discussion in Attachment C: Select Pages from Shared Parking, 2nd Edition). The effective supply cushion varies by land use and user group.

ULI MODEL PARKING DEMAND PROJECTIONS

Utilizing the program data and pairing base parking ratios, the peak demand for the Project is calculated assuming that each land use is separate and in a somewhat remote location. Next the peak demand projection is adjusted using non-captive demand and presence factors which include seasonality and time of day. For the New One Paseo project, adjustment for mode split is conservatively not assumed. These data are entered into the shared parking model to project weekday and weekend peak parking demand.

PROJECTED PARKING DEMAND – WEEKDAY PEAK

At build-out, the ULI Model projects a peak parking demand of 2,587± spaces on a weekday in December around 2:00 p.m. The largest single source of parking demand is the reserved resident/guest parking which is calculated at 1,057 parking spaces. The second largest source of parking is office employees and office visitors, who generate a demand for 877±, spaces during the period of peak demand. We calculate this demand using the model's projected ratio of 3.13 spaces per 1,000 SF GFA.[6] We break out the demand calculation in detail in the following table.

Table 3: Projected Peak Weekday Parking Demand

Land Use	Quantity	Weekday Base Rate	Stand Alone Use	Month Adj December	Pk Hr Adj 2:00 PM	Non Captive Daytime	Drive Ratio Daytime	Demand December 2:00 PM
Retail	47,711	2.90	138	100%	100%	95%	100%	131
Employee		0.70	33	100%	100%	100%	100%	33
Restaurant: Fine/Casual Dining	27,315	15.25	417	100%	65%	95%	100%	257
Employee		2.75	75	100%	90%	100%	100%	68
Restaurant: Fast Casual/Fast Food	20,845	12.75	266	100%	90%	50%	100%	119
Employee		2.25	47	100%	95%	100%	100%	45
Residential								
Studio/Efficiency	76	1.50	114	100%	100%	100%	100%	114
1 bedroom	273	1.50	410	100%	100%	100%	100%	410
2 bedroom	200	2.00	400	100%	100%	100%	100%	400
>3 bedroom	59	2.25	133	100%	100%	100%	100%	133
Office	280,000	0.23	64	100%	100%	100%	100%	64
Employee		2.90	813	100%	100%	100%	100%	813
Subtotal Customer/Guest			885					571
Subtotal Employee			968					959
Subtotal Reserved Resident			1,057					1,057
Total Required			**2,910**					**2,587**

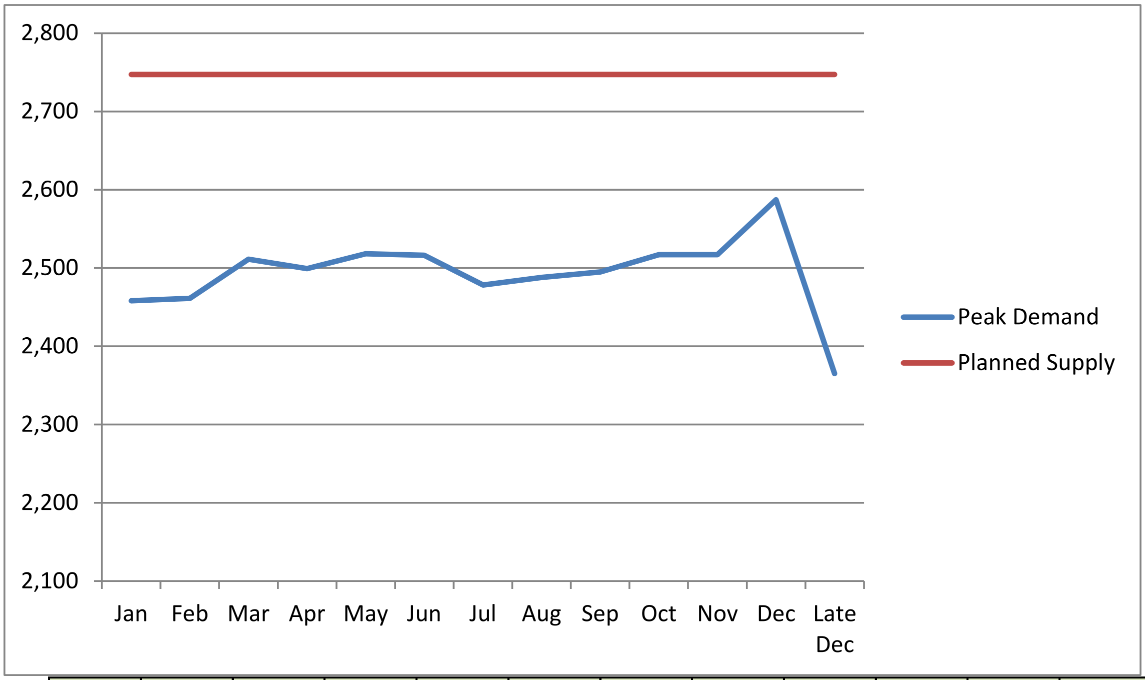
Source: Walker Parking Consultants; 2015

Because the planned supply for the site at build out is 2,747 spaces, the Walker/ULI shared parking analysis projects a surplus of ±160 spaces during the peak period of parking demand.

Peak demand for the next busiest month is roughly 69 spaces less than the December peak. Figure 3 shows projected peak parking demand by month, compared to the proposed parking supply.

[6] This ratio is based on ULI/Walker research that has determined that large blocks of office space use parking significantly more efficiently than smaller ones, resulting in lower base ratios. Further, higher end office of the type envisioned for the New One Paseo Campus also tends to generate a lower demand for parking than other types of office space, a fact that we did not quantify in our model but would tend to result in lower parking demand for office employees at the site. We assume that the office space will not include high density creative office or call center uses.

Figure 3: Projected Peak Weekday Parking Demand by Month



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Late Dec
Peak Demand	2,458	2,461	2,511	2,499	2,518	2,516	2,478	2,488	2,495	2,517	2,517	2,587	2,365
Planned Supply	2,747	2,747	2,747	2,747	2,747	2,747	2,747	2,747	2,747	2,747	2,747	2,747	2,747

Source: Walker Parking Consultants; 2015

With regard to parking demand patterns and peak demand, it is worth noting how often the peak demand for parking is projected to occur. <u>As the peak demand will occur infrequently, it should be noted that this surplus will be higher for more than 90% of days throughout the year</u>. The peak hour demand of 2,587± spaces is projected to occur on a December weekday at 2:00 PM, the peak observed for that month and the year. An examination of the peak demand for each of the other 12 months of the year[7] shows that the projected peak for those months does not exceed 2,518 spaces (in May).

As noted in the discussion of effective supply, the demand projection is for the number of spaces needed on the site and includes a small cushion to allow for drivers to find spaces with relative ease and thus facilitate circulation within the system. Parking guidance system technology (PGS) and other parking management measures that assist patrons in finding spaces would facilitate this process further.

[7] The latter part of December constitutes a "thirteenth" month for Shared Parking, as parking behavior at this time reflects substantially different parking patterns for uses than during the earlier part of the month.

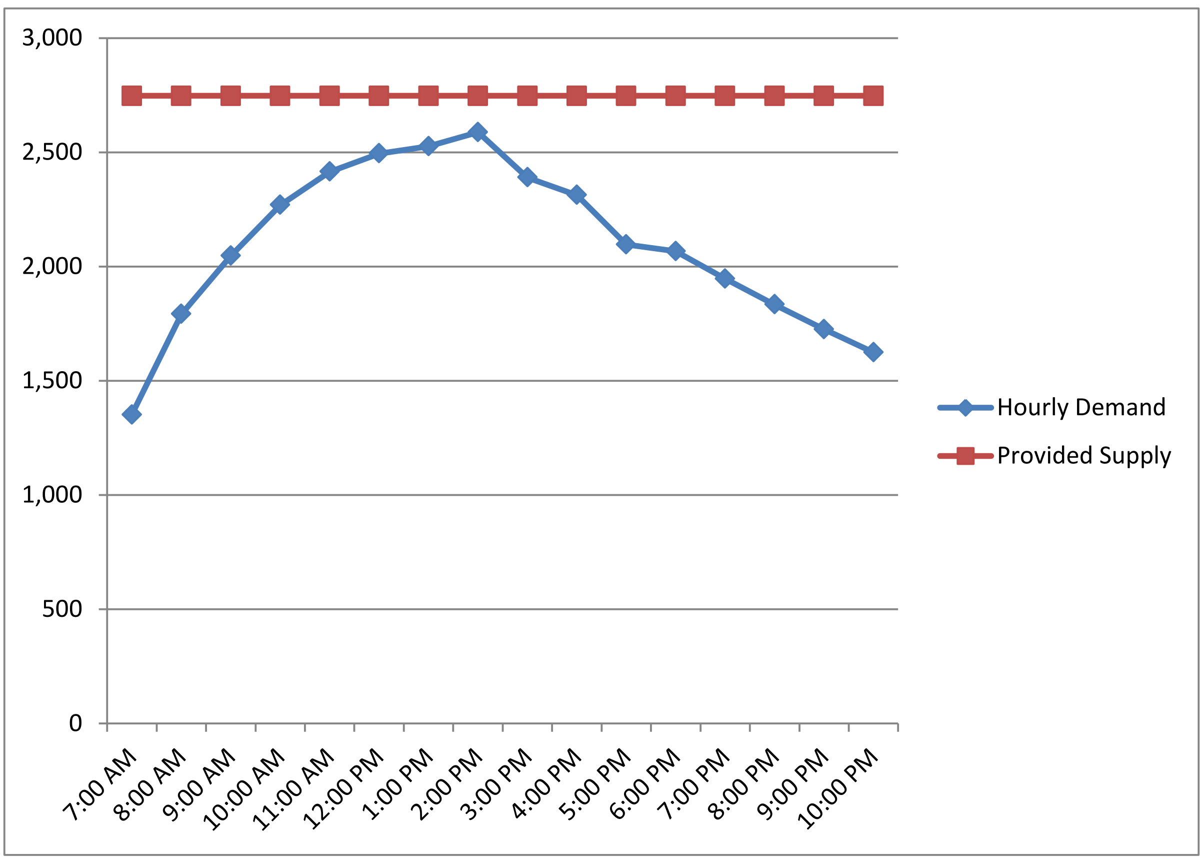
Table 4: Projected Accumulation on Peak Day by Hour - Weekday

Land Use	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM
Retail	12	33	64	100	129	151	164	164
Restaurant: Fine/Casual Dining	15	38	56	127	226	365	365	325
Restaurant: Fast Casual/Fast Food	22	40	59	108	160	179	179	164
Residential Guest	0	0	0	0	0	0	0	0
Residential Reserved	1,057	1,057	1,057	1,057	1,057	1,057	1,057	1,057
Office	245	623	810	877	842	742	761	877
Total	**1,351**	**1,791**	**2,046**	**2,269**	**2,414**	**2,494**	**2,526**	**2,587**

Land Use	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM
Retail	164	158	142	141	135	120	94	54
Restaurant: Fine/Casual Dining	214	254	372	451	471	471	471	451
Restaurant: Fast Casual/Fast Food	112	101	112	211	201	127	79	54
Residential Guest	0	0	0	0	0	0	0	0
Residential Reserved	1,057	1,057	1,057	1,057	1,057	1,057	1,057	1,057
Office	842	742	413	206	82	58	24	8
Total	**2,389**	**2,312**	**2,096**	**2,066**	**1,946**	**1,833**	**1,725**	**1,624**

Source: Walker Parking Consultants; 2015

Figure 4: Projected Accumulation on Peak Day by Hour - Weekday



Source: Walker Parking Consultants; 2015

PROJECTED PARKING DEMAND – WEEKEND PEAK

With the demand for office parking drastically reduced on the weekends, even with an increase in parking demand for uses such as retail and fine dining, we project a peak demand for parking at the proposed project site of 1,891± spaces. This is 700+ spaces less than the weekday peak. The parking demand by use during the weekend peak is shown in Table 5.

Table 5: Projected Peak Weekend Parking Demand

Land Use	Quantity	Weekend Base Rate	Stand Alone Use	Month Adj December	Pk Hr Adj 6:00 PM	Non Captive Evening	Drive Ratio Evening	Demand December 6:00 PM
Retail	47,711	3.20	153	100%	80%	100%	100%	122
Employee		0.80	38	100%	85%	100%	100%	32
Restaurant: Fine/Casual Dining	27,315	17.00	464	100%	90%	95%	100%	397
Employee		3.00	82	100%	100%	100%	100%	82
Restaurant: Fast Casual/Fast Food	20,845	12.00	250	100%	85%	75%	100%	159
Employee		2.00	42	100%	90%	100%	100%	38
Residential								
Studio/Efficiency	76	1.50	114	100%	100%	100%	100%	114
1 bedroom	273	1.50	410	100%	100%	100%	100%	410
2 bedroom	200	2.00	400	100%	100%	100%	100%	400
>3 bedroom	59	2.25	133	100%	100%	100%	100%	133
Office	280,000	0.02	6	100%	5%	100%	100%	0
Employee		0.29	81	100%	5%	100%	100%	4
Subtotal Customer/Guest			873					678
Subtotal Employee			243					156
Subtotal Reserved Resident			1,057					1,057
Total Required			**2,173**					**1,891**

Source: Walker Parking Consultants; 2015

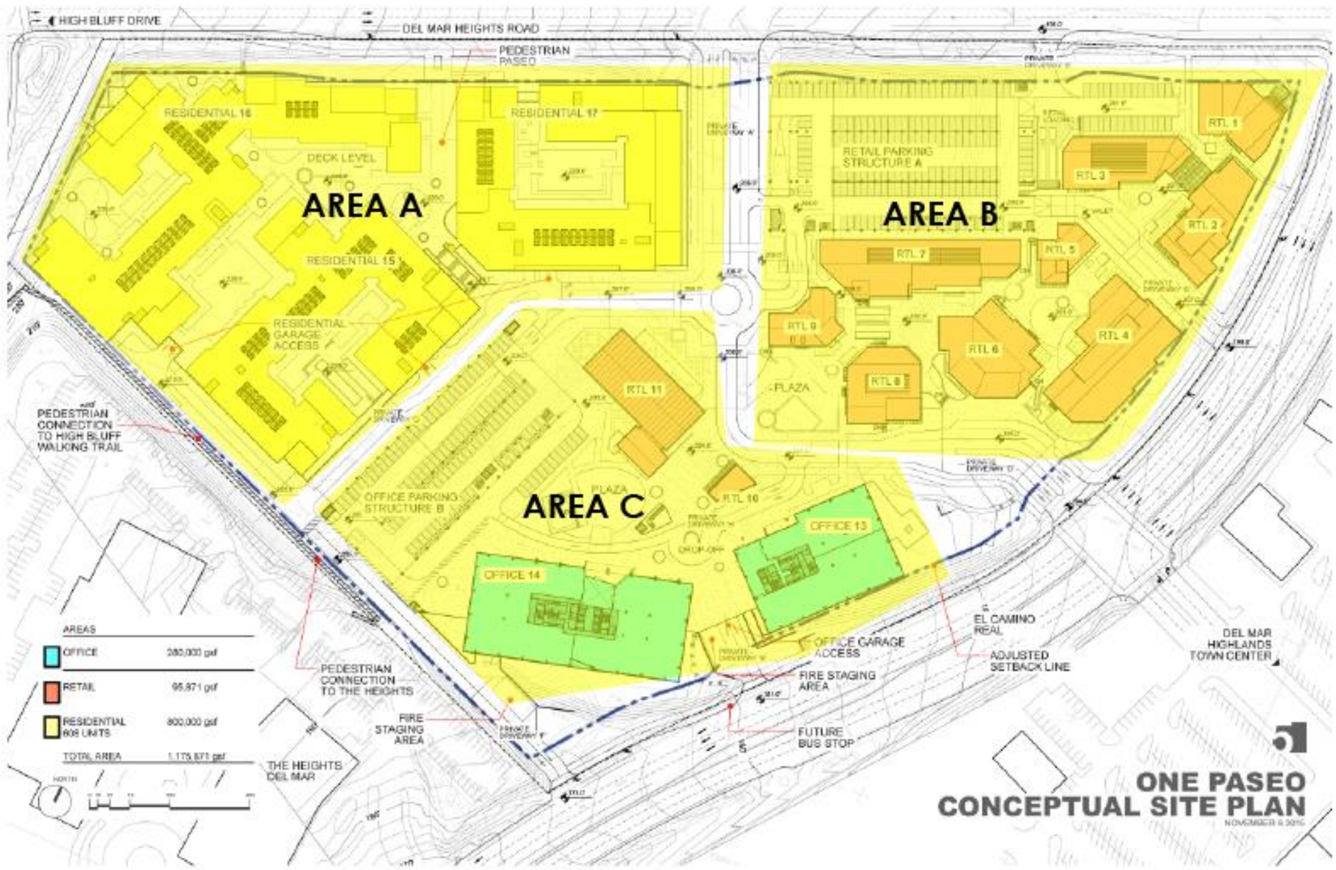
SITE BUILD-OUT AREA-BY-AREA PROJECTED PARKING DEMAND

The parking demand number for the entire site may not communicate where localized parking shortfalls and subsequent delays could occur. Delays in the parking system could create challenges as visitors, employees and customers are led to circulate through the facility in search of parking. New technology which informs drivers of the location of available spaces has reduced this problem considerably.

In order to understand the extent to which congestion may occur we have prepared analyses of shared parking demand by project area. This is done in order to understand the extent to which individual areas may rely on adjacent areas to meet the demand for parking they generate.

Figure 5 shows the proposed project site plan, split into three areas, along with a table showing the amount of land use in each area.

Figure 5: Project Area-by-Area Breakdown



Land Use	Project Total	Area A	Area B	Area C
Retail	47,711 TSF	-	44,301 TSF	3,410 TSF
Restaurant: Fine/Casual Dining	27,315 TSF	-	22,185 TSF	5,130 TSF
Restaurant: Fast Casual/Fast Food	20,845 TSF	-	15,935 TSF	4,910 TSF
Residential	608 DU	608	-	-
Office	280,000 TSF	-	-	280,000 TSF
Parking Spaces Provided[1]	2,747	1,057	570	1,120

1: Does not include 8 parking spaces in Area A along the private drive.

Note: TSF = thousand square feet, DU = dwelling unit

Source: Walker Parking Consultants; 2015

The provided residential parking will be for residents and their guests only, and will not be shared with the office and restaurant/retail portions of the project. The office and retail parking will be shared with the exception of certain reserved spaces for office tenants, such as the proposed tandem parking spaces.

Table 6 shows projected peak parking demand on an area-by-area basis.

Table 6: Projected Peak Parking Demand – Area-by-Area

Overall Peak									
Area	2:00 PM Dec Wkdy	Planned Supply	Surplus (Deficit)	Area	Peak Hour	Demand	Planned Supply	Area Surplus (Deficit)	Systemwide Surplus (Deficit)
A	1,057	1,057	0	A	24/7 Reserved	1,057	1,057	0	NA
B	542	570	28	B	Dec Wknd 7:00 PM	684	570	(114)	857
C	988	1,120	132	C	Dec Wkdy 2:00 PM	988	1,120	132	160
Total	2,587	2,747	160						

Note: Planned supply does not include 8 parking spaces in Area A along the private drive.

Source: Walker Parking Consultants; 2015

The table above shows the actual area-by-area surplus or deficit at the various times that the individual areas will peak. Our analysis demonstrates that during the overall peak, each area will have adequate parking within the area. The deficits that are expected to be experienced by Area B on some busy weekday and weekend evenings occur at times in which the large pool of parking in Area C has more than 800 spaces available, as office parking demand is projected to be negligible on weekday and weekend evenings. Once a strategy, as is discussed in the parking management section of this report, is put in place to park the employees of Area B away from customer spaces serving the retail/restaurant businesses, as is typically done in large commercial and mixed-use centers, Area B will have ample parking for its weekday evening and weekend customers. The fact that parking space deficits are small demonstrates that most of the shared parking actually occurs within and not between areas, which translates into spaces that are easier to find, increased efficiency and shorter walking distances.

IV. CITY OF SAN DIEGO PARKING REGULATIONS

The parking regulations for the City of San Diego are found within the Land Development Code Chapter 14, Article 2, Division 5. This section contains specifications related to minimum and maximum parking supply requirements, ability to share parking between different uses, and an allocation of special parking spaces (Carpool, Motorcycle, and Bicycle). In the following section of the report Walker presents how these regulations are calculated given the program data for the Project.

The methodology and tables contained in Section 142.0545 of the LDC are based on ratios and "variations in the number of parking spaces needed (parking demand) over the course of the day for the proposed uses." In fact, the base ratios and time of day (presence) factors are based on the ULI publication Shared Parking, 1st Edition, 1983. While much of the methodology is the same, Shared 1st Edition is today regarded in the fields of planning and parking as incomplete and out of date. ULI, Walker and firms throughout the parking industry continually update the base ratios and presence factors to incorporate the latest research and access to a greater number of data points.

This growing and improved information has at times resulted in changes to base ratios and time of day factors since the 1983 edition. The foreword from Shared Parking, 2nd Edition, 2005 has been included in Attachment C which specifically summarizes the necessity for the update. The use of more updated ULI information to a great extent accounts for the differences between the LDC and this study's calculation of projected parking space demand. It should be noted that the 2005 edition is a project collaboration between ULI and the International Council of Shopping Centers (ICSC) which helped create and endorses the findings of the latest edition.

KEY DIFFERENCES BETWEEN LDC SHARED PARKING AND ULI SHARED PARKING MODEL

The shared parking section of the LDC is based on the original ULI Shared Parking 1st Edition, published in 1983. However differences exist between the LDC's shared parking requirements and a shared parking analysis performed using ULI's Shared Parking, 2nd Edition, 2005. These differences result in the variation in parking demand projections recommended in this report from those calculated using the LDC methodology and factors.

A 1995 report by the Institute of Transportation Engineers ("ITE") Technical Council Committee, Shared Parking Planning Guidelines, concluded that the ULI Shared Parking methodology from the first edition in 1983 was the best approach, but the default values and recommendations needed to be updated. This was the goal of the 2nd Edition; the update was led by Walker Parking Consultants staff. Shared Parking, 2nd Edition, 2005 is the most up-to-date and accurate source for land-use based parking demand ratios and the most accurate and complete method of determining parking demand generated under shared-use conditions. Part of this completeness depends on the nuances incorporated into the ULI modeling process, which are not included in the Shared Parking Section of the LDC. These nuances are crucial for parking projection accuracy. They include the following factors, which are demonstrated in greater detail in the table contained in Attachment B:

- Adjustments for "non-captive" ratios within mixed-use developments: The model takes into account the fact that some customers in a mixed-use development are employees in that development (such as office workers or store clerks) who are already parked and therefore do not need parking, an important component in shared parking principles. The size of the non-captive ratio is related to the number of employees on the site and how they would interact with other land uses in the development; therefore these ratios cannot be included automatically and must be determined on a project-by-project basis. The LDC shared parking requirements do not account for non-captive ratios.
- Monthly factors: Peak parking demand may vary considerably over the course of the year for many land uses. Office workers are more likely to be on vacation during some days in December or during the summer, movie theatres tend to be busier during these months, and health clubs experience peak demand in January. The LDC does not account for monthly adjustments that should be made to accurately project parking demand.
- Sliding scales: Extensive observations and research by the ULI Shared Parking Model team found that parking demand per square foot of office space varies considerably depending on the amount of office space that exists. This results in large offices

generating more than 15% less demand for parking per square foot than small offices. The LDC shared parking requirements do not account for this sliding scale, which is important when projecting parking demand for office space (especially large office space). Walker studies have shown a number of large office complexes in Southern California that are hundreds of parking spaces "overparked," including some which actively seek to lease the available space to other uses.

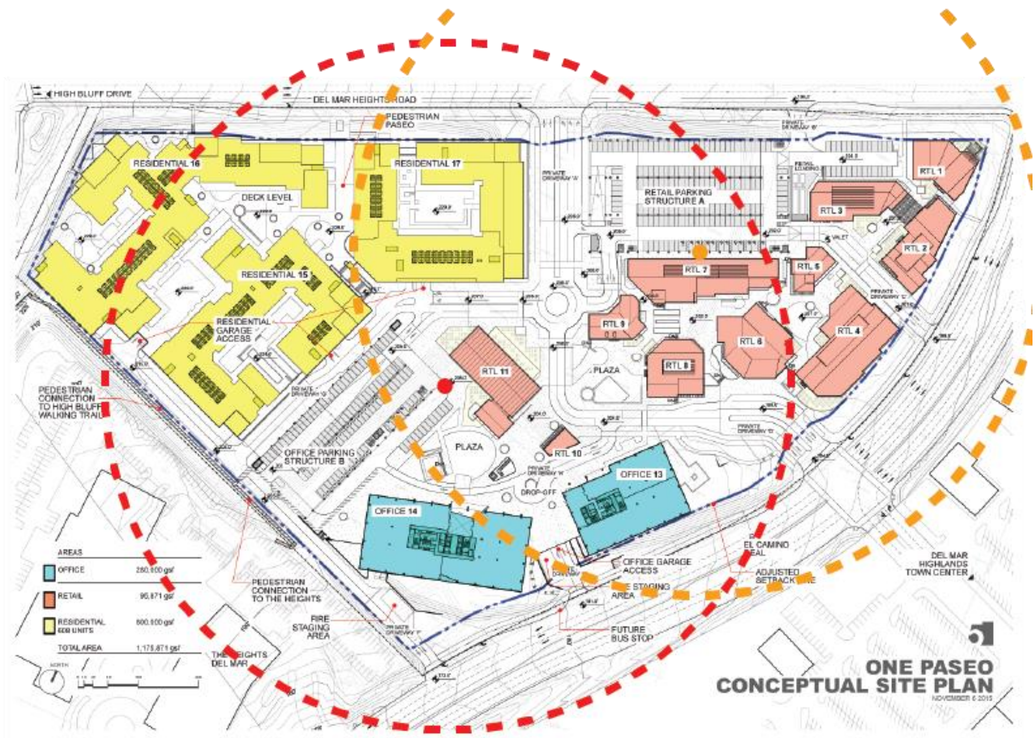
As noted above, the base parking ratios in Shared Parking, 2nd Edition (model and publication) have been researched to an unprecedented degree. While not all of the LDC's shared parking base ratios are higher than those in Shared Parking, 2nd Edition, a significant number of the ratios are higher, which is enough to result in City requirements for parking that significantly exceed actual demand. Our findings with regard to Shared Parking are based on the ULI research and methodology, and explained in greater detail throughout this report.

MAXIMUM WALKING DISTANCE

The City of San Diego's Land Development Code (LDC) Section 142.0545 allows for shared parking between at least two land uses provided that the parking to be shared is available within 600 feet of the land that is to use the supply of parking.

In response to City staff's specific inquiry regarding the location of the parking supply in relation to the uses within each area, we confirm that this requirement will be met. Figure 6 contains a site plan which demonstrates that the parking supply that is to be shared among the various areas are generally within 600 feet of parking demand generators. Approximately one-half of the retail/restaurant component of the project is located within 600-feet of the office parking structure.

Figure 6: 600-Foot Walking Distance Requirement



Source: Walker Parking Consultants; 2015

LDC SHARED PARKING RATIOS

The LDC primarily presents shared parking ratios in Table 142-05H and refers to Section 142.0525 for Multiple Dwelling Unit Residential Uses (including both resident and resident guest parking).

RESIDENTIAL PARKING REQUIREMENTS

In section 142.0525 the LDC allows for up to 25% of residential spaces to be shared (except at least 1 space shall be assigned to each dwelling unit for the resident). The modeling of the LDC requirement in this analysis reflects that the residential spaces, both resident and visitor, will be reserved.

Parking requirements within the LDC for residential land uses are based on the bedroom count for each dwelling unit, therefore the Applicant provided the following unit breakdown.

Table 7: LDC Residential Parking Requirements

Type of Unit	Number of Units	LDC Resident Ratio	LDC Parking Requirement
Studio >400 sqft	76	1.50/unit	114
1 Bedroom	273	1.50/unit	410
2 Bedroom	200	2.00/unit	400
3 Bedroom	59	2.25/unit	133
	608		1,057

Source: Walker Parking Consultants; 2015

LDC PARKING REGULATIONS FOR NON- RESIDENTIAL USES

In addition to base ratios and time of day factors differing slightly from the updated publication, the LDC Shared Parking Model lacks seasonal, non-captive and drive share adjustments. Although the peak periods for these land uses would likely not occur at the same time, their overlap in the LDC model accentuates the peak period that the LDC model projects. Attachment B of this report contains a table which compares the factors used in the City of San Diego's LDC and the ULI/Walker Model.

LDC SHARED PARKING REQUIREMENT – FULL BUILD-OUT

Based on the City's shared parking formula, at build-out a total of 2,850 spaces would be necessary assuming no sharing of residential resident/guest parking spaces with the rest of the development.

Table 8: Project LDC Shared Parking Requirement - Weekday

Land Use	Quantity	Code Req't per LDC	Unit	Unadjusted Demand	Pk Hr Adj 12:00 PM	Demand 12:00 PM
Retail	47,711	5.00	/KSF GFA	239	100%	239
Restaurant	48,160	15.00	/KSF GFA	722	100%	722
Residential						
Studio	76	1.50	/unit	114	100%	114
1-bedroom	273	1.50	/unit	410	100%	410
2-bedroom	200	2.00	/unit	400	100%	400
3-bedroom	59	2.25	/unit	133	100%	133
Office	280,000	3.30	/KSF GFA	924	90%	832
			Total Parking Spaces	2,942		2,850

Source: Walker Parking Consultants, LDC, 2015

Table 9 shows the hourly accumulation totals by land use based on LDC hourly adjustments for weekdays.

Table 9: LDC Shared Parking Hourly Accumulations - Weekday

Land Use	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM
Retail	24	72	120	167	191	239	227	203
Restaurant	397	578	469	181	469	722	578	397
Residential	0	0	0	0	0	0	0	0
Studio	114	114	114	114	114	114	114	114
1-bedroom	410	410	410	410	410	410	410	410
2-bedroom	400	400	400	400	400	400	400	400
3-bedroom	133	133	133	133	133	133	133	133
Office	139	508	832	924	924	832	785	832
	1,617	2,215	2,478	2,329	2,641	**2,850**	2,647	2,489

Land Use	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM
Retail	191	179	191	191	179	143	108	72
Restaurant	253	217	325	469	397	397	325	253
Residential	0	0	0	0	0	0	0	0
Studio	114	114	114	114	114	114	114	114
1-bedroom	410	410	410	410	410	410	410	410
2-bedroom	400	400	400	400	400	400	400	400
3-bedroom	133	133	133	133	133	133	133	133
Office	832	785	508	231	139	46	46	46
	2,333	2,238	2,081	1,948	1,772	1,643	1,536	1,428

Source: Walker Parking Consultants, LDC, 2015

The LDC provides separate shared parking regulations for both weekdays and weekend days. For reference, the weekend parking requirement is shown in Table 10. Since office space is a significant component of the land use mix of the Project, there is a higher projected parking requirement on weekdays when compared to weekends.

Table 10: Project LDC Shared Parking Requirement - Weekend

Land Use	Quantity	Code Req't per LDC	Unit	Unadjusted Demand	Pk Hr Adj 7:00 PM	Demand 7:00 PM
Retail	47,711	5.00	/KSF GFA	239	60%	143
Restaurant	48,160	15.00	/KSF GFA	722	100%	722
Residential						
Studio	76	1.50	/unit	114	100%	114
1-bedroom	273	1.50	/unit	410	100%	410
2-bedroom	200	2.00	/unit	400	100%	400
3-bedroom	59	2.25	/unit	133	100%	133
Guest Parking				160	75%	120
Office	0	0.50	/KSF GFA	0	25%	0
			Total Parking Spaces	2,178		2,042

Source: Walker Parking Consultants, LDC, 2015

CITY OF SAN DIEGO REGULATIONS FOR PARKING FOR OTHER VEHICLES

In addition to requirements for single occupied vehicles, the City Code addresses parking spaces for other types of vehicles, which include carpool vehicles, motorcycles and bicycles.

MOTORCYCLE, BICYCLE, AND CARPOOL SPACES

Table 11 shows the number of spaces required per the LDC Section 142.0525 for users of motorcycles and bicycles. The total required to be set aside for these users are as follows:

- Motorcycle spaces: 61 in the residential area, and 37 in the retail/restaurant areas. According to the LDC, these spaces are in addition to the required automobile spaces. Per the LDC, motorcycle spaces shall be at least 3 feet wide and 8 feet long.
- Bicycle spaces: 274 in the residential area, and 188 in the retail/restaurant areas. Of the 188 bicycle parking spaces in the retail/restaurant areas, 94 short-term and 94 long-term spaces are required.

Table 11: Required Bicycle and Motorcycle Spaces

Residential	Quantity (Dwelling Units)	Motorcycle Spaces Requirement	Total Required	Bicycle Spaces Requirement	Bicycle Spaces Total Required
Studio > 400 sqft	76	0.1 spaces per dwelling unit	8	0.4 spaces per dwelling unit	30
1 bedroom	273	0.1 spaces per dwelling unit	27	0.4 spaces per dwelling unit	109
2 bedroom	200	0.1 spaces per dwelling unit	20	0.5 spaces per dwelling unit	100
3 bedroom	59	0.1 spaces per dwelling unit	6	0.6 spaces per dwelling unit	35
		Total	61	Total	274

Commercial	Quantity (Square Feet)	Motorcycle Spaces Requirement	Total Required	Bicycle Spaces - Short-Term Requirement	Short-Term Total Required	Bicycle Spaces - Long-Term Requirement	Long-Term Total Required
Retail/Restaurant	95,871	2% of auto req't	19	5% of auto req't	48	5% of auto req't	48
Office	280,000	2% of auto req't	18	5% of auto req't	46	5% of auto req't	46
		Total	37	Total	94	Total	94

Source: Walker Parking Consultants, LDC, 2015

- Carpool/Zero Emissions Vehicle spaces: According to the LDC, carpool/zero emissions vehicle space requirements apply only to nonresidential land uses. The code states that if there are more than 201 automobile spaces provided on the premises, then at least 8% of the total automobile spaces should be designated for carpool and zero emissions vehicles. The project plans to provide 570 automobile spaces in Area B and 1120 automobile spaces in Area C. Therefore 46 parking spaces in Area B should be designated for carpool/zero emissions vehicles, and 90 parking spaces in Area C should be designated for carpool/zero emissions vehicles.

In some cases the number of spaces indicated as "Provided" may be lower than the code requirement, which is a result of our overall recommendation that the total number of spaces necessary for the development is less than what the LDC requires (which will be shown in subsequent sections). The following caveats and recommendations should be noted:

- To the extent that the code requirements for motorcycle, bicycle and carpool spaces are for stand-alone uses, they do not take into account the possible efficiencies to be gained from sharing spaces. This suggests that the actual demand for these spaces could be lower than the code requirement as well. A number of the code requirements, particularly for motorcycle spaces, are a function of the code requirement for automobiles; the ULI model peak parking demand projection for automobile spaces is roughly 10% lower than the calculated code requirement which would then translate to a motorcycle requirement that is roughly 10% lower than the calculated code requirement as well.

Table 12: Required Versus Recommended Bicycle and Motorcycle Spaces

	Motorcycle Spaces		Bicycle Spaces	
Land Use	**LDC Requirement**	**Recommended Supply**	**LDC Requirement**	**Recommended Supply**
Residential	61	61	274	274
Retail/Restaurant	19	17	96	86
Office	18	17	92	84

- Motorcycles and the spaces used to park them represent a far more efficient use of space than Single Occupancy Vehicles (SOV) spaces. However, because one can park a motorcycle or bicycle in an SOV space but not vice versa, these spaces cannot be "shared" and, if their usage is not maximized, can result in inefficiencies. These spaces should be provided in locations that otherwise could not be used (such as corners of the parking facilities).

- The provision of parking spaces for carpoolers, bicycle commuters and motorcyclists should result in a slight reduction in demand for automobile spaces. At a minimum, the reduction would be on an, at least, one-to-one basis for motorcycle, carpool and non-residential bicycle spaces. These items are part of a Transportation Demand

Management ("TDM") Plan used to reduce the parking demand for Single-Occupant Vehicles.

V. CONCLUSIONS AND RECOMMENDATIONS

The planned parking supply for the New One Paseo Project is 2,747 parking spaces in three parking structures and eight spaces on the internal private drive in Area A. For the purpose of accommodating parking demand during peak periods without overbuilding spaces that are likely to sit vacant most or all the year, 2,587 parking spaces are recommended based on the projections of the ULI Model. Table 13 summarizes the proposed parking supply by area.

Table 13: Proposed Parking Supply by Area

	Automobile Parking Spaces						
Parking Area	Regular	ADA	Carpool/Z EV	Total	Motorcycle	Short-Term Bicycle	Long-Term Bicycle
Area A (Residential)	1,037	20	-	1,057	61	274	
Area B - (Restaurant/Retail)	512	12	46	570	19	48	48
Area C (Office)[1]	1,008	22	90	1,120	18	46	46
Total	2,557	54	136	2,747	98	368	94

1 = Includes up to 100 tandem spaces dedictaed to office employee parking

Note: Planned supply does not include 8 parking spaces in Area A along the private drive.

Source: Walker Parking Consultants, LDC, 2015

In addition, the following points should be noted with regard to the parking demand projections that have come from the ULI Shared Parking Model:

- The assumptions used in our model are conservative. Very little patronage of the businesses on site by the office employees and residents is assumed when in fact such patronage is likely to occur and result in fewer customers of these businesses requiring parking spaces. No commuting to the site other than by single occupancy vehicles was assumed. All parking for employees and visitors is assumed to be free, consistent with the developer's current plans.

- Spikes in the demand for retail parking, such as "Black Friday" or the days around the Christmas holidays are likely to occur when office parking demand is low and spaces that typically serve office will be available to accommodate parking for other uses.

- Parking management policies for the New One Paseo Project's large parking supply will increase the efficiency of the system and reduce the number of spaces needed as such measures lead parkers more quickly to available spaces.

- Given that the square footage by land uses and residential bedroom count may be revised before the project is constructed, a set of parking ratios by land use has been developed to enable City staff to adjust the number of required shared parking spaces as necessary during the building permit process based on the results of the Walker/ULI shared parking analysis. These parking ratios are detailed below:

- Residential – the project plans to provide the City's LDC required number of parking spaces for residential land uses. If the number of units, or mix of bedrooms changes, the LDC required number of spaces will be recalculated and provided.
- Office – Based on the results of the Walker/ULI shared parking analysis, during the peak period of parking demand, the office land use generates a parking demand of 3.13 spaces per thousand square feet.
- Retail – Based on the results of the Walker/ULI shared paring analysis, during the peak period of parking demand, the retail land use generates a parking demand of 3.44 spaces per thousand square feet.
- Restaurant – Based on the results of the Walker/ULI shared paring analysis, during the peak period of parking demand, the restaurant land use generates a parking demand of 10.15 spaces per thousand square feet.

If square footages by land use are revised before the project is constructed, the ratios above could be used to adjust the planned parking supply as necessary. If large changes in retail/restaurant land uses occur, or if the amount of office space planned decreases, the shared parking analysis should be updated to ensure that the conclusions still hold.

The requirements needed to satisfy the City's shared parking code result in a higher number of spaces than that which ULI/ Model projects is necessary. However, based on our research and updated model we do not project that the New One Paseo Project will experience a need for more than the 2,587± spaces for other than atypical and infrequent circumstances.

It is likely the higher projected number based on the City LDC calculation of 2,850 parking spaces will result in an overbuilding of parking spaces that will not result in better service to drivers visiting the site.

DEVELOP A PARKING MANAGEMENT PLAN

Given the size of the parking supply to be provided, the accommodation of parking demand and development of a positive customer service experience for tenants and visitors can best be accomplished by establishing effective parking management policies. A parking management operation will be established on site, prior to the issuance of occupancy permits for the office/retail/restaurant section of the project. The responsibility of the parking management operation will be to manage the parking system, enforce management policies, and interact with the public in order to ensure that drivers find parking spaces and have a positive customer experience within the parking system. The parking management operations and implementation of the overall TDM plan will be the responsibility of the Community Association. Parking operations may be managed by a parking operator retained by the Community Association.

TANDEM PARKING

Of the total 2,754 parking spaces proposed for the New One Paseo project, the applicant proposes to provide a maximum of 100 tandem spaces (50 two-deep parking spaces meeting LDC design standards), dedicated to office employee parking only. LDC section 142.0555(b) states, "Tandem parking for commercial uses may be approved through a Neighborhood Development Permit provided the tandem parking is limited to the following purposes: (1) Assigned employee parking spaces; (2) Valet parking associated with restaurant use; and (3) Bed and breakfast establishments." Therefore, the use of tandem parking is permitted by the LDC, but if a Neighborhood Development Permit is not approved both spaces would not count toward meeting the minimum parking requirement; instead the two-deep tandem space would only count as one space and not two. Based on our analysis, this still provides a parking surplus; the model produces a peak parking demand of 2,587 versus a planned supply of 2,754. The analysis shows a 167-space surplus, but if up to a maximum of 50 of these spaces cannot count per the LDC, then a 117-space surplus still results.

The use of tandem parking spaces is a common practice that we recommend as an efficient method for maximizing office employee parking. Tandem parking can be administered utilizing an attendant-assist valet system of management whereby employees who park in any of the 50 "front" spaces hand their keys upon parking to an attendant who is present. The attendant, a staff member of the parking operation, holds the keys in case a vehicle in one of the "back" spaces needs to exit. Another management system that is available for employee parking applications is the use of a simple "buddy system," whereby the same two employee drivers consistently share a pair of tandem spaces and are therefore able to efficiently communicate with one another on those occasions where the "front" space vehicle needs to be moved. *The tandem spaces should be located in convenient locations near the elevators, making them an attractive employee parking option, as opposed to spaces located on the opposite end of the garage.*

WALKING DISTANCES

Every trip involving driving and parking begins and ends with a pedestrian trip. Typically the more popular the destination, the greater the walk that is required. Walker has done extensive research on walking distances and how far parkers can reasonably be expected to walk. The question is largely one of level of service. Customers and visitors require a higher level of service and usually should be required to walk less. Employees and other long-term parkers (with the exception of residents) can be provided with a lower level of service and be expected to walk greater distances. A summary of our general findings regarding walking distances is shown in the table below.

Table 14: Walking Distance Level of Service

	LOS A (feet)	LOS B (feet)	LOS C (feet)	LOS D (feet)
Maximum Walking Distance				
Within Parking Facilities				
Surface Lot	350	700	1,050	1,400
Structure	300	600	900	1,200
From Parking to Destination				
Climate Controlled	1,000	2,400	3,900	5,200
Outdoors, covered	500	1,000	1,500	2,000
Outdoors, uncovered	400	800	1,300	1,600

Source: Parking Structure, 3rd Edition, 2001

As shown earlier in our report, the parking supply within the site is well distributed according to where the demand for parking on the site will be generated. During the overall peak for the site (midday on a weekday), roughly all of the parking demand for each area can be accommodated within that area. When the demand for parking in Area B increases in the evenings and on weekends, more than 80% of the parking demand generated on these areas can be accommodated within the individual areas. Because the employee component of parking demand for retail or restaurant space typically represents roughly 20% of that demand, parking can be managed such that the employees will park in Area C.

We look forward to discussing our findings and recommendations with you at your earliest convenience.

Sincerely,

WALKER PARKING CONSULTANTS

Steffen Turoff, AICP
Department Head
Walker Parking Consultants

Jeff Weckstein
Parking Consultant
Walker Parking Consultants

ATTACHMENT A:
VALIDATION OF SHARED PARKING MODEL FOR PROJECTS SIMILAR TO THE ONE PASEO

The committee updating Shared Parking conducted a series of 13 case studies to verify that the shared parking model is reasonably accurate. These studies were conducted at a variety of shopping centers in California, Arizona, Ohio, Florida, and Virginia. The centers studied varied in size from 48,566 sf to 1,274,700 sf.

Eight of the thirteen case studies were on shopping centers in southern California. The size of these centers, their respective mix of land uses and the ratio of estimated demand/observed occupancy is shown in the following table. In most cases, the shared parking model estimated the parking demand within a few percent or in the case of the Long Beach Town Centre, over projected the number of spaces necessary. In two cases, the shared parking model under-projected the parking demand; however, in the case of The Block at Orange, the under projection did not occur during a peak month, and the committee believes that "the monthly variation at this center was significantly lower than normal . . . the 'valleys' in the monthly variation of parking demand seem less deep than those commonly seen."

Shared Parking Southern California Case Studies

								Estimated Demand/ Observed Occupancy			
		Size			Enter-			Weekday		Weekend	
Case	Name	(ksf)	Retail	Dining	tainment	Office	Other	Day	Evening	Day	Evening
1	Puente Hills Mall	1,190	87%	5%	7%	-	-	-	-	1.11	1.09
2	Fashion Island	1,174	88%	10%	2%	-	-	-	-	0.96	1.06
4	Long Beach Towne Center	832	77%	9%	15%	-	-	-	-	1.44	1.23
5	Covina Town Square	381	61%	10%	29%	-	-	-	-	-	1.06
6	Burbank Empire	614	92%	7%	-	1%	-	-	-	1.04	-
7	Westfield Promenade	546	81%	8%	10%	-	-	-	-	-	1.04
9	Irvine Spectrum, 2002	797	7%	13%	35%	45%	-	1.19	1.30	1.15	0.96
	Irvine Spectrum, 2003	1,274	24%	11%	20%	45%	-	1.19	1.46	0.92	0.82
12	Block at Orange[1]	1,175	40%	20%	20%	32%	3%	0.93	0.82	0.87	0.64
	SDCC	1,764	-	-	-	-	-				

1. Other is Health Club
2. Other includes Hotel (9%), Residential (32%) and Health Club (2%)

Source: Shared Parking, ULI, 2005.

Several of the case studies for centers that were near reasonable transit options were prepared with a uniform mode adjustment of 90%-95%, for all visitors and employees. The Block at Orange, for example, was initially prepared assuming a mode adjustment of 90%.

In planning for the parking demand at any facility, the parking demand ratios are obtained (where available) from data provided by the Institute of Transportation Engineers' Parking Generation (3rd edition, 2004.). Parking Generation provides the Average Peak Period Parking Demand, the 85th Percentile Parking Demand, and the 33rd Percentile Parking Demand. As with traffic, traffic engineers and parking consultants generally consider the 85th percentile demand to represent the target that will best serve communities and developers. As these parking ratios are based on statistical data, there will be some facilities that outperform others, resulting in higher parking demand. The committee responsible for the update to Shared Parking didn't consider the variations in parking demand to invalidate the parking model, but rather "are more indicative of the strength of tenants in a particular marketplace..."

Attachment B Table: Comparison of Factors – ULI/Walker Model and LDC Code

Sample Peak Demand Ratios - Weekday					
Land Use	Walker/ULI Model		LDC - Shared Parking		% LDC > ULI
Office (280 ksf)	3.13	/ksf	3.3	/ksf	5%
Retail	3.60	/ksf	3.6	/ksf	0
Fine/Casual Dining	18.00	/ksf	15	/ksf	-17%
Fast Casual/Fast Food	15.00	/ksf	15	/ksf	0
Residential including guest	1.67	/du blended	1.74	/du blended	4%

Sample Time Factors - 2:00 PM Weekday			
Land Use	Walker/ULI Model	LDC - Shared Parking	% LDC > ULI
Office	100%	90%	-10%
Retail	100%	85%	-15%
Fine/Casual Dining	65%	55%	-10%
Fast Casual/Fast Food	90%	55%	-35%

Sample Monthly Factors - December			
Land Use	Walker/ULI Model	LDC - Shared Parking	% LDC > ULI
Office	100%	100%	0%
Retail	100%	100%	0%
Fine/Casual Dining	100%	100%	0%
Fast Casual/Fast Food	100%	100%	0%

Sample Non Captive Factors			
Land Use	Walker/ULI Model	LDC - Shared Parking	% LDC > ULI
Retail	95%	100%	5%
Fine/Casual Dining	95%	100%	5%
Fast Casual/Fast Food	50%	100%	50%

Sources by land use:
Office: Data collected by Walker and other *Shared Parking* team members consisting of parking professionals nationwide.
Retail: Parking Requirements fo Shopping Center, Second Edition. Washington DC: ULI-The Urban Land Institute, 1999.
Restaurant: Parking Generation, Fourth Edition. Washington DC: Institute of Transportation Engineers, 2010

ATTACHMENT C SELECT PAGES FROM SHARED PARKING, 2ND EDITION, 2005

Foreword

Since the first edition of this book was published in 1983, the concept of shared parking has become well established as an important element of mixed-use developments, probably beyond the wildest dreams of its authors. That pioneering study demonstrated that when developments with complementary parking patterns were able to use the same parking, less was required. At the time, there was not even a generally accepted source of documented parking needs for individual land uses, so such data were developed as part of the original study. Over the subsequent two decades, shared parking has become a routine part of the design and approval of mixed-use developments. Parking needs have changed as a result of the evolution in mixed-use developments and changes in transportation, requiring a new look at the shared parking parameters advocated in 1983. With this publication, we are pleased both to validate the original study and to provide current data for a more complex mix of different potential land uses.

It is a tribute to the ground-breaking nature and thoroughness of the original shared parking study that it has taken so long to update it, and ULI could not have done it alone. Growing concerns from within and outside the ULI community made this project a priority for the Policy and Practice Committee. The publication of the third edition of *Parking Generation* by the Institute of Transportation Engineers provided a rich source of current parking data for single land uses that served as a foundation for an updated shared parking study. The International Council of Shopping Centers partnered with us to make the study a reality. A national study team of experts was established and a lead consultant selected to direct and manage the work.

This new publication provides up-to-date parking parameters that will be useful now and well in the future for many users, including local governments, developers, shopping center owners, and lenders. These new guidelines should help those users to integrate parking and development in the most responsible way.

Robert T. Dunphy
Project Director

Table 2-1 Land Use Changes between First and Second Editions of *Shared Parking*

Land Use[1] in Second Edition	Land Use in First Edition	Comment
Office (701) <25,000 sq. ft. Office (701) 25,000 to 100,000 sq. ft. Office (701) 100,000 to 500,000 sq. ft. Office (701) >500,000 sq. ft. Data Processing Center Medical/Dental Office (720) Bank with Drive-in (912)	Single category: Office	Per *Parking Generation*, separation is appropriate.
Retail Community Center <400,000 sq. ft. (820) Regional Center 400,000 to 600,000 sq. ft. (820) Super Regional Center >600,000 sq. ft. (820)	Retail (400,000 sq. ft.) Retail (600,000 sq. ft.)[2]	n/a
Fine/Casual Dining (Quality Restaurant, 931; High Turnover with Bar, 932) Family Restaurant (High Turnover with No Bar, 932) Fast Food (ITE Fast Food, 933)	Single category: Restaurant	Unpublished study by team member and *Parking Generation* indicated separation is appropriate.
Cineplex (444) (>10 screens)	Same	First-edition ratio was applicable for 1-5 screens.
Residential, Rented (221, 222, 224) Residential, Owned (230)	Single category: Residential	Per *Parking Generation*, separation is appropriate. Specific time of day and adjustment factors are provided for suburban and transit/CBD oriented locations.
Leisure Hotel (330)—Rooms Business Hotel (312)—Rooms Restaurant/Lounge Conference Center/Banquet (20 to 50 sq. ft./room) Convention (>50 sq. ft./room)	Guest Rooms Restaurant/Lounge Conference Rooms Convention Area	Per published references, separation is appropriate.
Convention Center (455)	Not covered	Common in shared parking situations, especially in central business districts.
Health Club (492)	Not covered	Common in shared parking situations.
Performing Arts Center (441)	Not covered	Common in shared parking situations.
Active Entertainment (400 series)	Not covered	Significant trend in retail development; due to wide variation in specific tenants, default values for parking ratios are not provided.
Nightclub	Not covered	Significant trend in retail development.
Arena	Not covered	Common in shared parking situations.
Baseball Stadium	Not covered	Common in shared parking situations.
Football Stadium	Not covered	Common in shared parking situations.

Notes

[1] The ITE *Parking Generation* land use code is provided in parenthesis.

[2] The text of the first edition of *Shared Parking* recommended that, between 400,000 and 600,000 sq. ft., the ratio should be linearly interpolated from 4.0 to 5.0 spaces per thousand sq. ft., which was consistent with the then-current ULI/ICSC publication on *Parking Requirements for Shopping Centers*. The table summarizing the parking ratios, however, identified retail as noted and thus was not completely clear regarding the ratio to be used between 400,000 and 600,000 sq. ft.

Table 2-2 Summary of Recommended Base Parking Ratios (Spaces per Unit Land Use)

Land Use	Weekday		Weekend		Unit	Source
	Visitor	Employee	Visitor	Employee		
Community Shopping Center (<400,000 sq. ft.)	2.9	0.7	3.2	0.8	/ksf[1] GLA	1
Regional Shopping Center (400,000 to 600,000 sq. ft.)	Sliding scale between 400,000 and 600,000 sq. ft.				/ksf GLA	1
Super Regional Shopping Center (>600,000 sq. ft.)	3.2	0.8	3.6	0.9	/ksf GLA	1
Fine/Casual Dining	15.25	2.75	17.0	3.0	/ksf GLA	2, 3
Family Restaurant	9.0	1.5	12.75	2.25	/ksf GLA	3
Fast-Food Restaurant	12.75	2.25	12.0	2.0	/ksf GLA	2
Nightclub	15.25	1.25	17.5	1.5	/ksf GLA	3
Active Entertainment	Custom to each tenant					
Cineplex	0.19	0.01	0.26	0.01	/seat	3, 2
Performing Arts Theater	0.3	0.07	0.33	0.07	/seat	2
Arena	0.27	0.03	0.3	0.03	/seat	3
Pro Football Stadium	0.3	0.01	0.3	0.01	/seat	3
Pro Baseball Stadium	0.31	0.01	0.34	0.01	/seat	3
Health Club	6.6	0.4	5.5	0.25	/ksf GFA	3, 4
Convention Center	5.5	0.5	5.5	0.5	/ksf GLA	3
Hotel—Business	1.0	0.25	0.9	0.18	/room	2, 3
Hotel—Leisure	0.9	0.25	1.0	0.18	/room	2, 3
Restaurant/Lounge	10.0	—	10.0	—	/ksf GLA	2, 3, 5
Conference Center/Banquet (20 to 50 sq. ft./guest room)	30.0	—	30.0	—	/ksf GLA	2, 3, 5
Convention Space (>50 sq. ft./guest room)	20.0	—	10.0	—	/ksf GLA	2, 3, 5
Residential, Rental	0.15	1.5[2]	0.15	1.5[2]	/unit	2
Residential, Owned	0.15	1.7[2]	0.15	1.7[2]	/unit	2
Office (<25,000 sq. ft.)	0.3	3.5	0.03	0.35	/ksf GFA	2
Office (25,000 to 100,000 sq. ft.) Sliding scale between					/ksf GFA	2
25,000 sq. ft.:	0.3	3.5	0.03	0.35		
100,000 sq. ft.:	0.25	3.15	0.03	0.32		
Office (100,000 to 500,000 sq. ft.) Sliding scale between					/ksf GFA	2
100,000 sq. ft.:	0.25	3.15	0.03	0.32		
500,000 sq. ft.:	0.2	2.6	0.02	0.26		
Office >500,000 sq. ft.	0.2	2.6	0.02	0.26	/ksf GFA	2
Data Processing Office	0.25	5.75	0.03	0.58	/ksf GFA	2, 3
Medical/Dental Office	3.0	1.5	3.0	1.5	/ksf GFA	2, 3
Bank, Branch with Drive-in	3.0	1.6	3.0	1.6	/ksf GFA	2

Notes

Ratios based on peak parking spaces required with virtually 100% auto use and typical ridesharing for suburban conditions.
[1]/ksf = per thousand sq. ft.
[2]1.0 spaces reserved for residents' sole use, 24 hours a day, remainder shared with visitors and other uses.

Sources:

1. *Parking Requirements for Shopping Centers*, 2nd ed. (Washington, D.C.: ULI–the Urban Land Institute, 1999).
2. *Parking Generation*, 3rd ed. (Washington, D.C.: Institute of Transportation Engineers, 2004).
3. Data collected by team members.
4. John W. Dorsett, "Parking Requirements for Health Clubs," *The Parking Professional*, April 2004.
5. Gerald Salzman, "Hotel Parking: How Much Is Enough?" *Urban Land*, January 1988.

Table 2-3 Recommended Monthly Adjustment Factors for Customer/Visitor Parking

Land Use	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Late DEC	Source
Shopping Center	56%	57%	64%	63%	66%	67%	64%	69%	64%	66%	72%	100%	80%	1, 3
Restaurant	85%	86%	95%	92%	96%	95%	98%	99%	91%	96%	93%	100%	95%	1
Fast Food	85%	86%	95%	92%	96%	95%	98%	99%	91%	96%	93%	100%	95%	1
Nightclub	84%	86%	98%	90%	90%	91%	94%	96%	92%	98%	96%	100%	95%	1
Cineplex Weekdays	27%	21%	20%	19%	27%	41%	55%	40%	15%	15%	25%	23%	100%	3
Cineplex Weekends	71%	59%	67%	58%	71%	82%	92%	75%	51%	62%	78%	67%	100%	3
Performing Arts Theater	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%	100%	100%	2
Arena	90%	100%	100%	100%	100%	75%	—	—	60%	65%	90%	95%	95%	2
Pro Football Stadium[1]	—	—	—	—	—	—	—	67%	—	—	—	100%	100%	2
Pro Baseball Stadium	—	—	—	100%	100%	100%	100%	100%	100%	100%	—	—	—	2
Health Club	100%	95%	85%	70%	65%	65%	65%	70%	80%	85%	85%	90%	95%	2, 4
Convention Center[2]	75%	100%	90%	55%	60%	50%	45%	75%	80%	85%	100%	60%	—	2
Hotel—Business	71%	85%	91%	90%	92%	100%	98%	92%	93%	93%	81%	67%	50%	5
Hotel—Leisure	90%	100%	100%	100%	90%	90%	100%	100%	75%	75%	75%	50%	100%	5
Restaurant/Lounge	85%	86%	95%	92%	96%	95%	98%	99%	91%	96%	93%	100%	95%	1
Meeting/Banquet (20 to 50 sq. ft./guest room)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	2
Convention (>50 sq. ft./guest room)	75%	100%	90%	55%	60%	50%	45%	75%	80%	85%	100%	60%	—	2
Residential	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	2
Office, Bank	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%	2, 6

Notes

December = December 1-24. Late December = December 25-31

[1]Because there is only one weeknight game and no Saturday games per NFL team September through November, and activity patterns are modified at adjacent uses due to the crowds expected, this category is not considered a "design day" for parking planning

[2]Many convention centers are completely dark between Christmas and New Year's Day

Sources:

1 U.S. Census Bureau, unadjusted estimates of monthly retail and food service sales, 1999-2002
2 Data collected by team members
3 Parking Generation, 3rd ed. (Washington, D.C.: Institute of Transportation Engineers, 2004)
4 John W. Dorsett, "Parking Requirements for Health Clubs," The Parking Professional, April 2004
5 Smith Travel Research, www.wwstar.com
6 Parking study conducted by Patton Harris Rust & Associates for the Peterson Companies, 2001

Table 2-4 Recommended Monthly Adjustment Factors for Employee Parking

Land Use	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Late DEC	Source
Shopping Center	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	90%	100%	90%	1, 2
Restaurant	95%	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	1, 2
Fast Food	95%	95%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	1, 2
Nightclub	90%	90%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	1, 2
Cineplex Weekdays	50%	50%	50%	50%	50%	75%	75%	75%	50%	50%	50%	50%	100%	3, 2
Cineplex Weekends	80%	80%	80%	80%	80%	100%	100%	90%	80%	80%	80%	80%	100%	3, 2
Performing Arts Theater	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	2
Arena	100%	100%	100%	100%	100%	75%	10%	10%	75%	75%	100%	100%	100%	2
Pro Football Stadium[1]	10%	10%	10%	10%	10%	10%	10%	100%	10%	10%	10%	100%	100%	2
Pro Baseball Stadium	10%	10%	10%	10%	100%	100%	100%	100%	100%	100%	10%	10%	10%	2
Health Club	100%	100%	95%	80%	75%	75%	75%	80%	90%	95%	95%	100%	100%	4, 2
Convention Center	85%	100%	100%	65%	70%	60%	55%	85%	90%	95%	100%	70%	10%	5, 2
Hotel	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	2
Residential	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	2
Office, Bank	100%	100%	100%	100%	100%	100%	95%	95%	100%	100%	100%	100%	80%	6

Notes

December = December 1-24, Late December = December 25-31

[1]Because there is only one weeknight game and no Saturday games per NFL team September through November and activity patterns are modified at adjacent uses due to the crowds expected, this category is not considered a "design day" for parking planning.

Sources:

1 U.S. Census Bureau, unadjusted estimates of monthly retail and food service sales, 1999-2002
2 Data adjusted by team members.
3 *Parking Generation*, 3rd ed. (Washington, D.C.: Institute of Transportation Engineers, 2004)
4 John W. Dorsett, "Parking Requirements for Health Clubs," *The Parking Professional*, April 2004
5 Smith Travel Research, www.wwstar.com
6 Parking study conducted by Patton Harris Rust & Associates for the Peterson Companies, 2001

Table 2-5 Recommended Time-of-Day Factors for Weekdays

Land Use	User	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon	1 p.m.	2 p.m.
Shopping Center—Typical	Customer	1%	5%	15%	35%	65%	85%	95%	100%	95%
Peak December	Customer	1%	5%	15%	30%	55%	75%	90%	100%	100%
Late December	Customer	1%	5%	10%	20%	40%	65%	90%	100%	100%
	Employee	10%	15%	40%	75%	85%	95%	100%	100%	100%
Fine/Casual Dining	Customer	—	—	—	—	15%	40%	75%	75%	65%
	Employee	—	20%	50%	75%	90%	90%	90%	90%	90%
Family Restaurant	Customer	25%	50%	60%	75%	85%	90%	100%	90%	50%
	Employee	50%	75%	90%	90%	100%	100%	100%	100%	100%
Fast Food	Customer	5%	10%	20%	30%	55%	85%	100%	100%	90%
	Employee	15%	20%	30%	40%	75%	100%	100%	100%	95%
Nightclub	Customer	—	—	—	—	—	—	—	—	—
	Employee	—	—	—	5%	5%	5%	5%	10%	10%
Cineplex—Typical	Customer	—	—	—	—	—	—	20%	45%	55%
Late December	Customer	—	—	—	—	—	—	35%	60%	75%
	Employee	—	—	—	—	—	—	50%	60%	60%
Performing Arts Theater	Customer	—	—	—	1%	1%	1%	1%	1%	1%
No matinee	Employee	—	10%	10%	20%	20%	20%	30%	30%	30%
Arena	Customer	—	—	—	1%	1%	1%	1%	1%	1%
No matinee	Employee	—	10%	10%	20%	20%	20%	30%	30%	30%
Stadium	Customer	—	—	—	1%	1%	1%	5%	5%	5%
8 p.m. start	Employee	—	10%	10%	20%	20%	20%	30%	30%	30%
Health Club	Customer	70%	40%	40%	70%	70%	80%	60%	70%	70%
	Employee	75%	75%	75%	75%	75%	75%	75%	75%	75%
Convention Center	Visitor	—	—	50%	100%	100%	100%	100%	100%	100%
	Employee	5%	30%	33%	33%	100%	100%	100%	100%	100%
Hotel—Business	Guest	95%	90%	80%	70%	60%	60%	55%	55%	60%
Hotel—Leisure	Guest	95%	95%	90%	80%	70%	70%	65%	65%	70%
Restaurant/Lounge	Customer	—	10%	30%	10%	10%	5%	100%	100%	33%
Conference/Banquet	Customer	—	—	30%	60%	60%	60%	65%	65%	65%
Convention	Customer	—	—	50%	100%	100%	100%	100%	100%	100%
	Employee	5%	30%	90%	90%	100%	100%	100%	100%	100%
Residential	Guest	—	10%	20%	20%	20%	20%	20%	20%	20%
Residential	Reserved	100%	100%	100%	100%	100%	100%	100%	100%	100%
Residential	Resident	100%	90%	85%	80%	75%	70%	65%	70%	70%
Office	Visitor	—	1%	20%	60%	100%	45%	15%	45%	100%
Office	Employee	3%	30%	75%	95%	100%	100%	90%	90%	100%
Medical/Dental Office	Visitor	—	—	90%	90%	100%	100%	30%	90%	100%
	Employee	—	—	60%	100%	100%	100%	100%	100%	100%
Bank	Customer	—	—	50%	90%	100%	50%	50%	50%	70%
	Employee	—	—	60%	100%	100%	100%	100%	100%	100%

3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.	Midnight	Source
90%	90%	95%	95%	95%	80%	50%	30%	10%	—	1
100%	95%	85%	80%	75%	65%	50%	30%	10%	—	1
100%	95%	85%	70%	55%	40%	25%	15%	5%	—	1
100%	100%	95%	95%	95%	90%	75%	40%	15%	—	2
40%	50%	75%	95%	100%	100%	100%	95%	75%	25%	2
75%	75%	100%	100%	100%	100%	100%	100%	85%	35%	2
45%	45%	75%	80%	80%	80%	60%	55%	50%	25%	2
75%	75%	95%	95%	95%	95%	80%	65%	65%	35%	2
60%	55%	60%	85%	80%	50%	30%	20%	10%	5%	3
70%	60%	70%	90%	90%	60%	40%	30%	20%	20%	2
—	—	—	25%	50%	75%	100%	100%	100%	100%	2
10%	20%	45%	70%	100%	100%	100%	100%	100%	100%	2
55%	55%	60%	60%	80%	100%	100%	80%	65%	40%	2, 6
80%	80%	80%	70%	80%	100%	100%	85%	70%	55%	2, 6
75%	75%	100%	100%	100%	100%	100%	100%	70%	50%	2
1%	1%	1%	1%	25%	100%	100%	—	—	—	2
30%	30%	30%	100%	100%	100%	100%	30%	10%	5%	2
1%	1%	1%	10%	25%	100%	100%	85%	—	—	2
30%	30%	30%	100%	100%	100%	100%	30%	10%	5%	2
5%	5%	5%	10%	50%	100%	100%	85%	25%	—	2
30%	30%	30%	100%	100%	100%	100%	100%	25%	10%	2
70%	80%	90%	100%	90%	80%	70%	35%	10%	—	2, 4
75%	75%	100%	100%	75%	50%	20%	20%	20%	—	2, 4
100%	100%	100%	50%	30%	30%	10%	—	—	—	2
100%	90%	70%	40%	25%	20%	20%	5%	—	—	2
60%	65%	70%	75%	75%	80%	85%	95%	100%	100%	5
70%	75%	80%	85%	85%	90%	95%	95%	100%	100%	2
10%	10%	30%	55%	60%	70%	67%	60%	40%	30%	5, 3
65%	65%	100%	100%	100%	100%	100%	50%	—	—	2
100%	100%	100%	50%	30%	30%	10%	—	—	—	2
100%	90%	70%	40%	20%	20%	20%	20%	10%	5%	2
20%	20%	40%	60%	100%	100%	100%	100%	80%	50%	2
100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	2
70%	75%	85%	90%	97%	98%	99%	100%	100%	100%	2
45%	15%	10%	5%	2%	1%	—	—	—	—	2
100%	90%	50%	25%	10%	7%	3%	1%	—	—	3
100%	90%	80%	67%	30%	15%	—	—	—	—	2
100%	100%	100%	67%	30%	15%	—	—	—	—	2
50%	80%	100%	—	—	—	—	—	—	—	3
100%	100%	100%	—	—	—	—	—	—	—	2

Sources:

1 Confidential data provided by shopping center managers
2 Developed by team members
3 *Parking Generation*, 3rd ed. (Washington, D.C.: Institute of Transportation Engineers, 2004).
4 John W. Dorsett, "Parking Requirements for Health Clubs," *The Parking Professional*, April 2004.
5 Gerald Salzman, "Hotel Parking: How Much Is Enough?" *Urban Land*, January 1988.
6 Parking study conducted by Patton Harris Rust & Associates for the Peterson Companies, 2001.

Table 2-6 Recommended Time-of-Day Factors for Weekends

Land Use	User	6 a.m.	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon	1 p.m.	2 p.m.
Shopping Center—Typical	Customer	1%	5%	10%	30%	50%	65%	80%	90%	100%
Peak December	Customer	1%	5%	10%	35%	60%	70%	85%	95%	100%
Late December	Customer	1%	5%	10%	20%	40%	60%	80%	95%	100%
	Employee	10%	15%	40%	75%	85%	95%	100%	100%	100%
Fine/Casual Dining	Customer	—	—	—	—	—	15%	50%	55%	45%
	Employee	—	20%	30%	60%	75%	75%	75%	75%	75%
Family Restaurant	Customer	10%	25%	45%	70%	90%	90%	100%	85%	65%
	Employee	50%	75%	90%	90%	100%	100%	100%	100%	100%
Fast Food	Customer	5%	10%	20%	30%	55%	85%	100%	100%	90%
	Employee	15%	20%	30%	40%	75%	100%	100%	100%	95%
Nightclub	Customer	—	—	—	—	—	—	—	—	—
	Employee	—	—	—	5%	5%	5%	5%	10%	10%
Cineplex—Typical	Customer	—	—	—	—	—	—	20%	45%	55%
Late December	Customer	—	—	—	—	—	—	35%	60%	75%
	Employee	—	—	—	—	—	—	50%	60%	60%
Performing Arts Theater	Customer	—	—	—	1%	1%	1%	1%	17%	67%
With matinee	Employee	—	10%	10%	20%	20%	20%	30%	100%	100%
Arena (two shows)	Customer	—	—	—	1%	1%	1%	1%	25%	95%
	Employee	—	10%	10%	20%	20%	20%	30%	100%	100%
Stadium (1 p.m. start; see weekday for evening game)	Customer	—	—	1%	1%	5%	5%	50%	100%	100%
	Employee	—	5%	10%	20%	30%	30%	100%	100%	100%
Health Club	Customer	80%	45%	35%	50%	35%	50%	50%	30%	25%
	Employee	50%	50%	50%	50%	50%	50%	50%	50%	50%
Convention Center	Visitor	—	—	50%	100%	100%	100%	100%	100%	100%
	Employee	5%	30%	33%	33%	100%	100%	100%	100%	100%
Hotel—Business	Guest	95%	90%	80%	70%	60%	60%	55%	55%	60%
Hotel—Leisure	Guest	95%	95%	90%	80%	70%	70%	65%	65%	70%
Restaurant/Lounge	Customer	—	10%	30%	10%	10%	5%	100%	100%	33%
Conference/Banquet	Customer	—	—	30%	60%	60%	60%	65%	65%	65%
Convention	Customer	—	—	50%	100%	100%	100%	100%	100%	100%
	Employee	5%	30%	90%	90%	100%	100%	100%	100%	100%
Residential	Guest	—	20%	20%	20%	20%	20%	20%	20%	20%
Residential	Reserved	100%	100%	100%	100%	100%	100%	100%	100%	100%
Residential	Resident	100%	90%	85%	80%	75%	70%	65%	70%	70%
Office	Visitor	—	20%	60%	80%	90%	100%	90%	80%	60%
Office	Employee	—	20%	60%	80%	90%	100%	90%	80%	60%
Medical/Dental Office	Visitor	—	—	90%	90%	100%	100%	30%	—	—
	Employee	—	—	60%	100%	100%	100%	100%	—	—
Bank	Customer	—	—	25%	40%	75%	100%	90%	—	—
	Employee	—	—	90%	100%	100%	100%	100%	—	—

3 p.m.	4 p.m.	5 p.m.	6 p.m.	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.	Midnight	Source
100%	95%	90%	80%	75%	65%	50%	35%	15%	—	1
100%	95%	90%	80%	75%	65%	50%	35%	15%	—	1
100%	95%	85%	70%	60%	50%	30%	20%	10%	—	1
100%	100%	95%	85%	80%	75%	65%	45%	15%	—	2
45%	45%	60%	90%	95%	100%	90%	90%	90%	50%	2
75%	75%	100%	100%	100%	100%	100%	100%	85%	50%	2
40%	45%	60%	70%	70%	65%	30%	25%	15%	10%	2
75%	75%	95%	95%	95%	95%	80%	65%	65%	35%	2
60%	55%	60%	85%	80%	50%	30%	20%	10%	5%	3
70%	60%	70%	90%	90%	60%	40%	30%	20%	20%	2
—	—	—	25%	50%	75%	100%	100%	100%	100%	2
10%	20%	45%	70%	100%	100%	100%	100%	100%	100%	2
55%	55%	60%	60%	80%	100%	100%	100%	80%	50%	2, 6
80%	80%	80%	70%	80%	100%	100%	100%	85%	70%	2, 6
75%	75%	100%	100%	100%	100%	100%	100%	70%	50%	2
67%	1%	1%	1%	25%	100%	100%	—	—	—	2
100%	30%	30%	100%	100%	100%	100%	30%	10%	5%	2
95%	81%	1%	1%	25%	100%	100%	—	—	—	2
100%	100%	30%	100%	100%	100%	100%	30%	10%	5%	2
85%	25%	—	—	—	—	—	—	—	—	2
100%	25%	10%	5%	5%	—	—	—	—	—	2
30%	55%	100%	95%	60%	30%	10%	1%	1%	—	2, 4
50%	75%	100%	100%	75%	50%	20%	20%	20%	—	2, 4
100%	100%	100%	50%	30%	30%	10%	—	—	—	2
100%	90%	70%	40%	25%	20%	20%	5%	—	—	2
60%	65%	70%	75%	75%	80%	85%	95%	100%	100%	5
70%	75%	80%	85%	85%	90%	95%	95%	100%	100%	2
10%	10%	30%	55%	60%	70%	67%	60%	40%	30%	5
65%	65%	100%	100%	100%	100%	100%	50%	—	—	5
100%	100%	100%	50%	30%	30%	10%	—	—	—	2
100%	90%	75%	60%	55%	55%	55%	45%	45%	30%	5
20%	20%	40%	60%	100%	100%	100%	100%	80%	50%	2
100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	2
70%	75%	85%	90%	97%	98%	99%	100%	100%	100%	2
40%	20%	10%	5%	—	—	—	—	—	—	2
40%	20%	10%	5%	—	—	—	—	—	—	3
—	—	—	—	—	—	—	—	—	—	2
—	—	—	—	—	—	—	—	—	—	2
—	—	—	—	—	—	—	—	—	—	3
—	—	—	—	—	—	—	—	—	—	2

Sources:

1 Confidential data provided by shopping center managers.
2 Developed by team members.
3 *Parking Generation*, 3rd ed. (Washington, D.C.: Institute of Transportation Engineers, 2004).
4 John W. Dorsett, "Parking Requirements for Health Clubs," *The Parking Professional*, April 2004.
5 Gerald Salzman, "Hotel Parking: How Much is Enough?" *Urban Land*, January 1988.
6 Parking study conducted by Patton Harris Rust & Associates for the Peterson Companies, 2001.

planned parking, proximity to transportation, and so on) and functional design (user friendliness). Even though multiple uses may be located at a single development site, if there is a sea of asphalt for surface parking surrounding each use, it may be difficult to get those bound for a retail/dining/entertainment complex to park at a nearby office building and walk to the destination. It may be necessary to use management strategies such as valet parking or to run a shuttle to more distant parking areas when it is required to meet demand. Chapter 6 includes further exploration of these issues.

Step 2: Select Parking Ratios

The methodology requires the selection for each significant land use of a parking ratio, which is the number of spaces that would be needed if the land use were located by itself in an area with little or no transit and weak pedestrian connections with other uses (the so-called cornfield development). This book recommends parking ratios for a variety of land uses often found in shared parking situations. Where uses not discussed here are included in a shared parking situation, appropriate parking ratios must be developed.

Note that this second edition includes more land uses than the first edition and features more stratification of land uses within broad categories. Individual changes will be further discussed in the section on the development of factors for each land use; the changes and additions are also summarized in Table 2-1.

This book's recommended parking ratios aim to represent the peak accumulation of vehicles at the peak hour on a design day for that land use, as those terms have been defined in chapter 1. Unless otherwise noted in the discussion of a particular land use, the 85th percentile of observed peak-hour accumulations (ignoring seasonality) was employed in determining the parking ratios. The first edition of *Shared Parking* employed the 90th percentile of the peak-hour occupancies observed. In a 1990 article, an Institute of Transportation Engineers (ITE) committee recommended use of the 85th percentile as an appropriate design standard.[1] Weant and Levinson[2] and Smith[3] generally recommended the 85th percentile, as did the Parking Consultants Council.[4] The third edition of *Parking Generation* presents 33rd and 85th percentile values as well as the average values for each land use, to frame the variation in parking ratios and for determining appropriate parking ratios from the data set.

The issue of the appropriate design day/hour for parking has become more of a controversy in recent years as smart growth principles have become more widely accepted. Some planners argue that parking supplies should be based on the average of the peak-hour occupancies observed in order to avoid underused spaces. Others believe that "more is better" and that communities should be protected from the negative impacts of parking shortages with an effective supply factor over and above expected accumulations on most if not all days.

As noted previously, designing a parking system so that every space is occupied at a regularly occurring peak hour will result in a conclusion by owners and users, if not the community at large, that the parking is inadequate. Some have argued that recommended parking ratios should be based on the 85th percentile observation plus an additional effective supply factor of 5–10 percent. Those disagreeing point out that in many cases a system may then have enough spaces to accommodate the 100th percentile accumulation, albeit inefficiently due to increased search time for available spaces.

After considerable debate, the study team for this second edition of *Shared Parking* adopted the 85th percentile of peak-hour observations in developing recommended parking ratios. However, it should be noted that relatively few land uses in *Parking Generation* have a large enough sample size that the 85th percentile value as published was deemed reliable enough to be used directly, without further consideration. In the majority of land uses, the judgment of the *Shared*

Parking team was required to finalize the ratios. Individual considerations for each land use are discussed in chapter 4.

The *Shared Parking* team believes that using the 85th percentile will provide an adequate supply cushion in most locations. But a parking supply based on this ratio will be inadequate for a certain number of locations that perform above the average. For example, some new commercial developments have a "honeymoon" period of high activity after opening, only to settle into a more typical pattern after locals have had a chance to patronize the site. Conversely, there may be a period of time as long as three years during which patronage gradually climbs to a stabilized level. Competitive factors in a local marketplace may also affect whether or not a particular destination will perform above the 85th percentile of all the comparable destinations nationwide. The first entry into a marketplace that satisfies unmet consumer demand will often perform better than average. If exceptional performance by one venue is sustained, competitors will usually enter the marketplace and performance may subsequently become more typical or average.

When a proposed new concept does not quite fit established land use categories and perhaps is being beta tested at a particular development, adjustment from parking ratios for the most closely related land use may be required. While the owners of such venues may be loathe to reveal their business plan, a special parking ratio can be developed by combining likely peak-hour density of patrons and employees with assumptions for modal split and persons per car.

Customizing parking ratios for a particular tenant, however, particularly when it lowers the ratio, is usually not advisable from a longer-term perspective. One of the truisms of almost any business catering to consumer demand is that what is fashionable today can be forgotten tomorrow.

Separate parking ratios should be employed for weekends and weekdays, and thus they are provided here for the land uses included in this report. Weekdays are typically defined as the period of Monday through Friday, and weekends are typically defined as Saturday and Sunday. However, many entertainment venues are as busy on Friday nights as on Saturday nights, while few land uses generate parking needs on Sundays similar to that on Saturdays. Among the land uses that consistently do have peak activity on Sundays are places of worship and professional football stadiums. The parking for either of those uses usually overwhelms the demand from any other use at the peak hours, and thus shared parking is not generally a critical issue for Sunday conditions and there is little published data on Sunday parking needs. Therefore no recommendations are made for Sunday parking demand in this book. For the purposes of this report, "weekday" is defined to be the period from midnight Monday morning to 5 p.m. Friday afternoon. "Weekend" includes Friday evening and all day Saturday.

The adjustment of parking needs for combinations of uses is easier to understand and more reliably predicted if the parking ratios are broken into the components of visitor/customer and employee/resident demand. Other analysts have termed this long-term and short-term demand. Technically speaking, however, some customers (such as hotel guests) park as long or longer than employees, and part-time employees often qualify as short-term parkers (by most definitions, those who stay less than three or four hours). Therefore, this report's recommended parking ratios are broken into visitor/customer and employee/resident components.

The modal splits to private auto for customers and employees are likely to be somewhat different in areas where there is good public transportation. Employees of tenants in an office complex are more likely to use public transportation or to carpool than visitors to those same tenants. There are also some differences in the time-of-day adjustments, depending on whether the user is an employee/tenant. The employees, performers, and staff at a performing arts center will arrive several hours before a scheduled performance, and

If one does not have reliable data for a similarly sited project, one must make some assumptions. Let us consider a hypothetical large office building in Schaumburg, Illinois, which has reasonably good bus transit service. Many commuters, however, will have to transfer between buses in downtown Schaumburg to reach this location. While the census data indicate that 95.2 percent of employees working in this community commute by private auto, that percentage reflects those who take bus and commuter rail service to employment downtown. The local government is requiring the developer to institute transportation demand management measures in this particular activity center, but no data on modal split or ridesharing are yet available. Thus, the modal split to private auto at the project site will be lower than for commuters to areas without such programs, but higher than for commuters to the regional central business district served by transit. It would then be reasonable to assume that this location will be in the middle of the range of percentage using transit. A projection of 95 percent of the employees at the office building commuting by private auto would appear to be a reasonable starting point, equivalent to the percentage currently commuting to downtown Schaumburg by private auto. It is somewhat more difficult to adjust the workers-per-car ratio, but if 10 percent of the 95 percent commuting by private auto will arrive as passengers due to the ridesharing programs, that leaves 85 percent among all employees as drivers. Because the parking ratios assume a nearly 100 percent modal split to private auto and very little ridesharing, or nearly 100 percent drivership, the overall reduction in parking needs due to modal split and persons per car would then be achieved by multiplying the employee parking ratio by 0.85. The equivalent persons per auto of this assumption is 95%/85% or 1.12, somewhat higher than the locality's average ratio of 1.06 persons per auto for all commuters, which seems reasonable for a project that will have a coordinated ridesharing program. For the visitor component, a much lower adjustment for transit usage would be expected: perhaps 0.95 (a 5 percent reduction of parking needs as compared with a more typical "cornfield" site).

Understanding the types of employees generally associated with a land use is also important in adjusting such ratios. For example, hotel and retail employees are more likely to use transit, to carpool, or to be picked up and dropped off than office employees at the same location. However, the parking ratios already reflect the typical modal splits for a particular type of use, even though the setting is assumed to be a suburban location with little or no transit. Adjustments should be made only when the auto occupancy for that use would be unusually affected.

Step 6: Apply Noncaptive Adjustments

Both formal studies and general experience have proven that some reduction of customer parking needs occurs in a mixed-use project due to patronage of multiple land uses. The term "captive market" has been borrowed from market researchers to describe people who are already present in the immediate vicinity and are likely patrons of a second use. For example, a parking demand analysis may consider that employees in a complex or district may already have parked at another land use and thus will not generate any parking demand when they patronize a coffee store or shop for a few minutes while on a break. If an office is located on a "cornfield" site, most employees will not leave the property during breaks, and therefore the office parking ratio at lunchtime and other breaks already reflects the use of that parking space by that employee.

Determining appropriate noncaptive factors is the step that requires the greatest professional judgment and experience. It is important to understand the difference between sequential and simultaneous trips when estimating the effects of captive market influences on the parking supply.

The development community uses the term "captive" for patrons who are already nearby and may be more easily attracted to a land use. The traffic engineer similarly uses "captive" for patrons who are already present for another purpose and thus do not generate another vehicle trip to the site. The parking planner must therefore determine for each time period whether the captive patrons are already counted as parked for another land use and thus do not generate the need for additional parking spaces at that particular hour. The following examples further explain these issues.

- When a traffic engineer estimates that 20 percent of a cinema's patrons are also going to eat at the restaurants in a retail/entertainment center, it is clearly legitimate to reduce the number of inbound and outbound trips to the project to reflect the fact that new trips to the restaurants will not be made via automobile (but rather are already accounted for in the trip generation estimates for the cinema). However, if a family goes to a movie and then goes to dinner (i.e., a sequential trip), the overall parking demand for the project is not reduced either during the movie or while they dine. The car is parked in the project's parking supply for 90–120 minutes for the movie and for 60 minutes or more for dinner.
- With this same trip combination, if the parents have a leisurely dinner while the children go to a movie, this simultaneous trip to two destinations within the center would indeed result in reductions in both trip generation and parking demand. In this case, the car would be counted as parked at the restaurant, and a reduction in the parking demand would be applied to the cinema.
- The employee who stays to dine and attend a movie after work would not be captive from a parking perspective. That employee may be more likely to patronize the on-site restaurant and cinema than to stop at a restaurant or cinema somewhere else on the way home (thus reducing automobile trips to and from the project); however, the time-of-day factors in this book assume that an employee leaves after the end of normal working hours. Thus, a parking space is needed to serve an employee's visit to the restaurant and the cineplex in the evening. During the daytime, an employee patronizing a restaurant may be considered captive, as 90 percent of employees are assumed to stay on site during the lunch hour in the time-of-day factors for employee parking at office buildings.

The key then is to evaluate what percentage of the users at one land use are already counted as being parked for another land use at that particular hour.

Market studies documenting visits to multiple destinations within an existing project can be helpful in determining the noncaptive adjustments for parking needs at a project. Normally, such market studies are not designed to distinguish between sequential and simultaneous visits. The responder is usually asked simply to name all the venues visited on a particular trip to the center. To quantify sequential trips, the questioner must ask where each person arriving in a vehicle is or was at specific times, which is significantly more time-consuming for both questioner and respondent.

When the study team calibrated the shared parking model to actual conditions at one successful retail/entertainment complex, detailed market studies and customer interviews were available identifying the percentage of patrons that visited multiple venues in the complex. When these percentages were entered directly into the shared parking model as estimates of the captive market, the model seriously underestimated the parking demand revealed by actual occupancy counts. The interview percentages thus had to be reduced by 50 percent when used as noncaptive estimates, to get the model to correctly predict parking demand at the center. This complication illustrated the effects of sequential versus simultaneous trips and the need for caution in estimating high levels of captive market even when survey data are available.

Because captive market effects typically reduce the parking needs, the factor employed to adjust the parking ratio is actually the percentage of customers who are not considered captive, or the noncaptive ratio. For example, if 10 percent of the patrons for a food court are expected to be employees of other land uses, the noncaptive ratio is 90 percent.

In addition to evaluation of simultaneous versus sequential visits to destinations, the magnitude of noncaptive adjustments is affected significantly by the combinations of land uses and more specifically the relative quantities. For example, the noncaptive adjustments for a 10,000-square-foot restaurant in a 40,000-square-foot strip shopping center will be distinctly different from the adjustments for the same size restaurant in a mixed-use project with significant office space or hotel rooms. Even then, one must carefully evaluate the potential for patronage of one use by another. With a 10,000-square-foot restaurant in a complex with 100,000 square feet of office space and 30,000 square feet of retail, one would expect there to be no more than 350 employees at the office (estimated from 3.15 employee parking spaces per 1,000 square feet with 1.08 persons per car) and 25 employees at the retail stores (estimated from the weekday parking ratio of 0.70 employee spaces per 1,000 square feet of retail). Any visitor to either land use who eats lunch will be present in a sit-down restaurant for nearly an hour and therefore should be considered to be parked at the restaurant at the noon hour. The restaurant would have about 250 seats (at an estimated 25 seats per thousand square feet). If a noncaptive adjustment of 30 percent is assumed, it is effectively stating that 75 of the 375 employees, or about 20 percent, from the complex eat at the restaurant every day of the week. A 90 percent noncaptive ratio at the restaurant (25 or 10 percent of the 250 seats filled by employees from the complex at lunchtime) would be much more reasonable for this combination. If, instead, the restaurant is a 1,000-square-foot deli with seating for less than 50 people and provides carryout service as well, 75 percent or more of the patrons could be employees of the complex. If the deli is located in a 100,000-square-foot suburban office building without any retail, virtually 100 percent of the patrons may be captive office employees.

Thus, using ranges of noncaptive factors for each land use would be misleading; in fact, they would be meaningless, since the ranges could be extremely broad: zero to 100 percent of the patrons of a restaurant may be noncaptive on daytime weekdays, as demonstrated above. Therefore, suggested ranges of noncaptive factors are not tabulated in this book. Instead, the analyst must evaluate the reasonableness of the captive market estimates for each development by comparing potential patronage from other uses with the expected patronage at peak hours.

There is sometimes confusion regarding whether a patron is captive or simply uses the mode of walking. These distinctions are far easier to understand in self-contained developments, as those who walk from other uses within the project would be considered captive, while those who walked from uses outside the project would be considered to affect the mode adjustment. The issue is considerably more murky in a downtown area; some visitors to a land use may walk from offices, residences, and other land uses and thus could be considered either as captive patrons or as customers who walked to the complex. The important thing is not to double count such patrons both as captive and as noncaptive customers who do not drive and park.

The need to carefully apply such factors to the specific peak hours being modeled necessarily makes shared parking analysis a complex undertaking, often requiring that multiple hours be individually evaluated to determine the overall peak accumulation of demand. It is for this reason that the methodology for shared parking analysis recommended in this edition has been slightly modified to clearly indicate that noncaptive adjustments should be made after time-of-day

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Addendum to Sight Visibility Report

Introduction

This Addendum addresses a revised development proposal for the One Paseo project, which was approved in February 2015. This project is referred to as the "Approved Project". The City Council subsequently rescinded some of the project approvals at the request of Kilroy to provide an opportunity to address local community concerns. The redesigned project is referred to as "New One Paseo Project". The focus of this Addendum is to determine whether the analysis and conclusions contained in the original report (Appendix E of the Final Environmental Impact Report [FEIR]) for the One Paseo Project remain applicable to the New One Paseo Project.

Background

The original report evaluated a development proposal consisting of 1,857,444 gross square feet (gsf) including residential, retail, office and hotel uses. For purposes of this Addendum, this development proposal is referred to the "Originally Proposed Project". Subsequent to the preparation of the original report, Kilroy redesigned the project to reduce the development to 1,454,069 gsf. The major changes included elimination of the hotel, reduction in square footage of residential, retail and office uses, and the addition of a green space. An analysis of this redesigned project was included in the EIR as the "Reduced Main Street Alternative" (also referred to as the "Approved Project"). An Addendum, dated December 17, 2012, to the original Report was prepared to address the Approved Project; that Addendum is included in the Final EIR (FEIR) as Appendix E.1.

Subsequent to the approval of the Approved Project, Kilroy has redesigned the development proposal to further reduce the total size of the project to 1,175,871 gsf. More information on the New One Paseo Project is included in the project description section of this Addendum.

Project Description

The New One Paseo Project retains the residential, retail and office uses, but eliminates the green space that was included in the Approved Project. The total number of residential units would remain 608. However, the square footage of retail and office uses would be reduced from both the Originally Proposed Project and the Approved Project. Table 1 and Figure 1 illustrate the land uses included in the New One Paseo Project.

Table 1. Land Uses

Land Use	Gross Square Footage	Number of Units
Office (Multi-tenant)	280,000	--
Retail	95,871	--
Residential	800,000	608
Total	**1,175,871**	**608**

A comparison of the land uses included in the New One Paseo Project with the Approved Project and the Originally Proposed Project is included in Table 2. With respect to the Originally Proposed Project, the New One Paseo Project would result in a 50 percent reduction in the amount of office space, and a 64 percent reduction in the amount of retail space. The number of residential units would remain unchanged. The hotel would be eliminated. The overall square footage would decrease by 37 percent from 1,857,440 to 1,175,871 gsf.

When compared with the Approved Project, the New One Paseo Project would reduce the office space by 44 percent. The retail component would be reduced by 61 percent. The green space would be eliminated. Overall the total square footage of the development would be reduced by 19 percent from 1,454,069 to 1,175,871 gsf. The number of residential units would remain unchanged.

Analysis

A review of the New One Paseo project shows there are four driveways along the west side of El Camino Real. An analysis of sight distance at three driveways influenced by their locations along the inside of a 1,000 foot radius centerline curve on El Camino Real was completed for the Originally Proposed Project, based on the 85th percentile speed and methodology described in the Sight Visibility Report in Appendix E of the FEIR, it was concluded that adequate sight distance for motorists would exist at all three driveways with the dedication of sight visibility easements. A review of the New One Paseo Project indicates that the driveway located at Station 121+72.52 on El Camino Real, as shown on the attached Exhibit B, would be at the same location as with the Originally Proposed Project and thus, would have adequate sight distance with the previously proposed sight visibility easement. With the New One Paseo Project, the driveways located at Station 125+40 and at Station 117+22.40 have been relocated to Station 124+51.50 and Station 116+73.24, respectively. The new position of the driveway at Station 124+51.50 is 88.5 feet further south along the inside of the 1,000-foot centerline curve than the location identified in the Originally Proposed Project. This change in the location requires the adjustment of the sight visibility easement, as shown on the attached Exhibit A, and would not affect the conclusion of the earlier analysis that sufficient sight distance would exist at this driveway. The new position of the driveway at Station 116+73.24 shows the sight line is now contained entirely within the public right of way, as shown on the attached Exhibit C, and no sight visibility easement is now required for this driveway. The southernmost driveway located at Station 114+11.58 is on the outside of a 1,800 foot radius centerline curve, and was concluded by inspection that no further analysis was required. The sight line is contained entirely within the proposed right of way, as shown on the attached Exhibit D, and confirms that no sight visibility easement is required for this driveway.

Conclusion

As discussed above, we conclude that the New One Paseo Project would not result in any new impacts related to sight distance issues at the proposed project driveways to El Camino Real, with the minor adjustment made to the sight visibility easements for the revised driveway locations. Nor, would the New One Paseo Project result in an increase severity in the sight distance impacts identified in our original report.

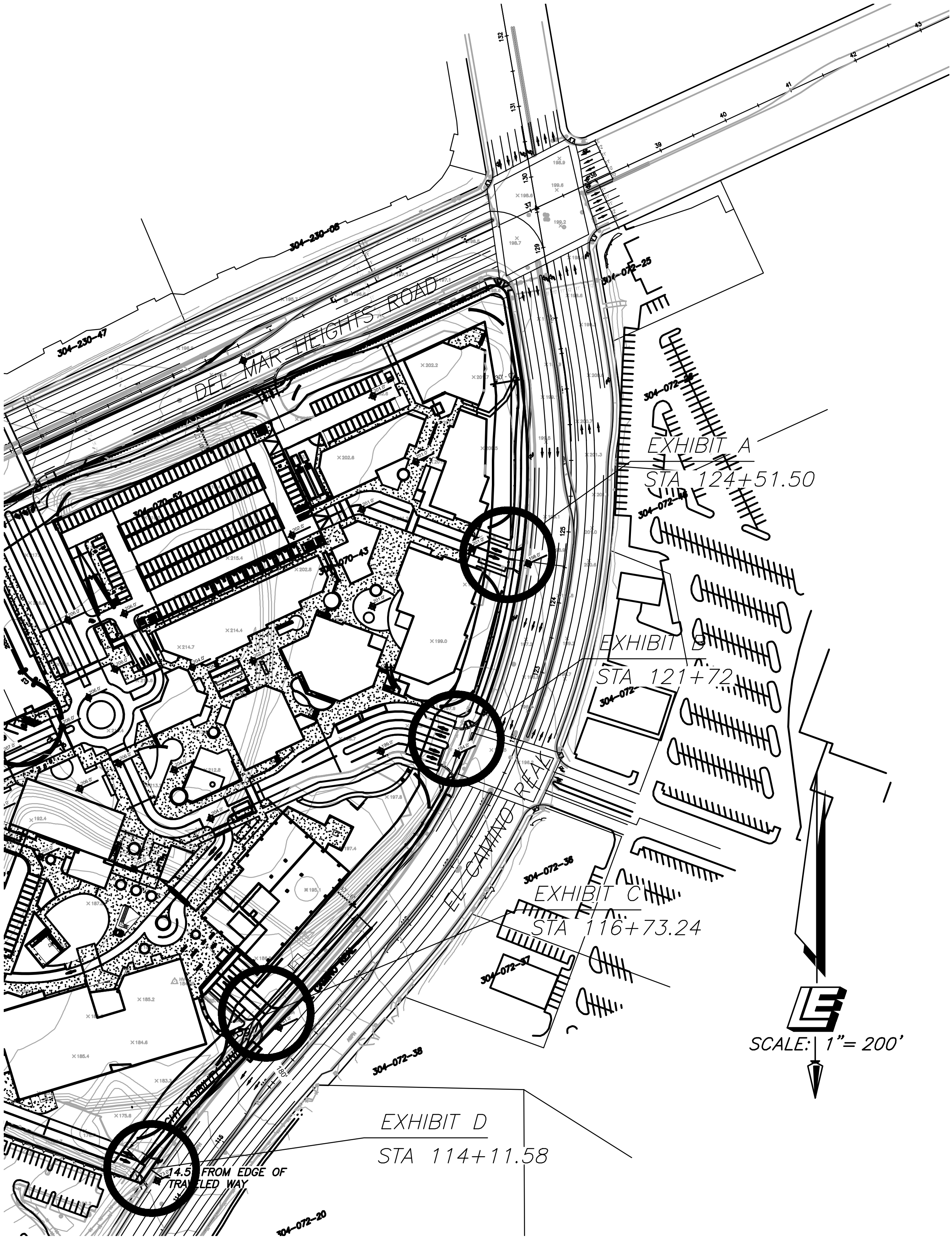
Respectfully submitted,

LEPPERT ENGINEERING CORPORATION,

Anthony M. Dieli

Anthony M. Dieli, P.E.
RCE 31615

LOCATION MAP -- SIGHT VISIBILITY ANALYSIS



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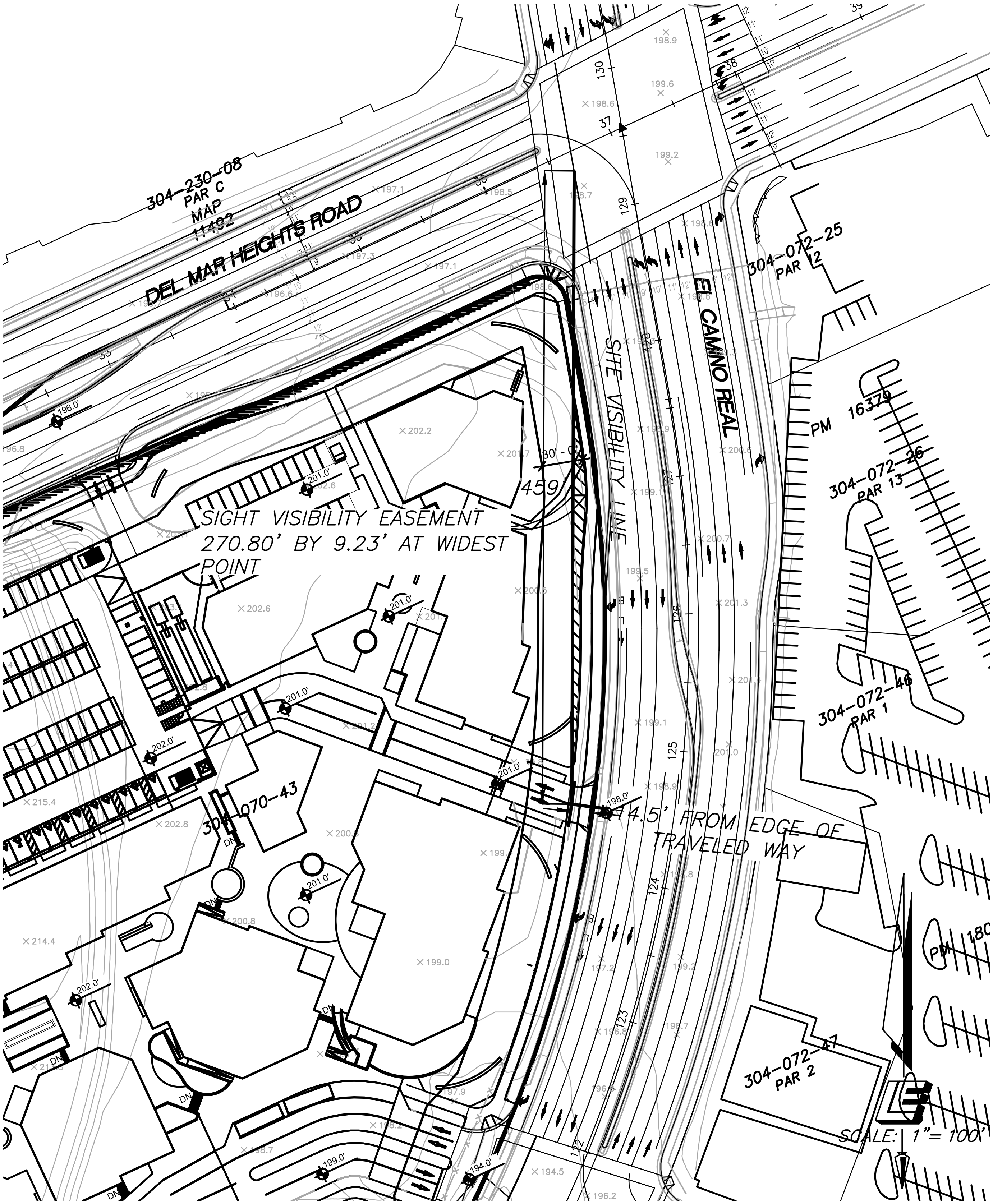
Phone: (619) 597-2001 Fax: (619) 597-2009

EXHIBIT A ~ SIGHT VISIBILITY AT DRIVEWAY 124+51.50



SIGHT VISIBILITY EASEMENT

Leppert
Engineering
CORPORATION

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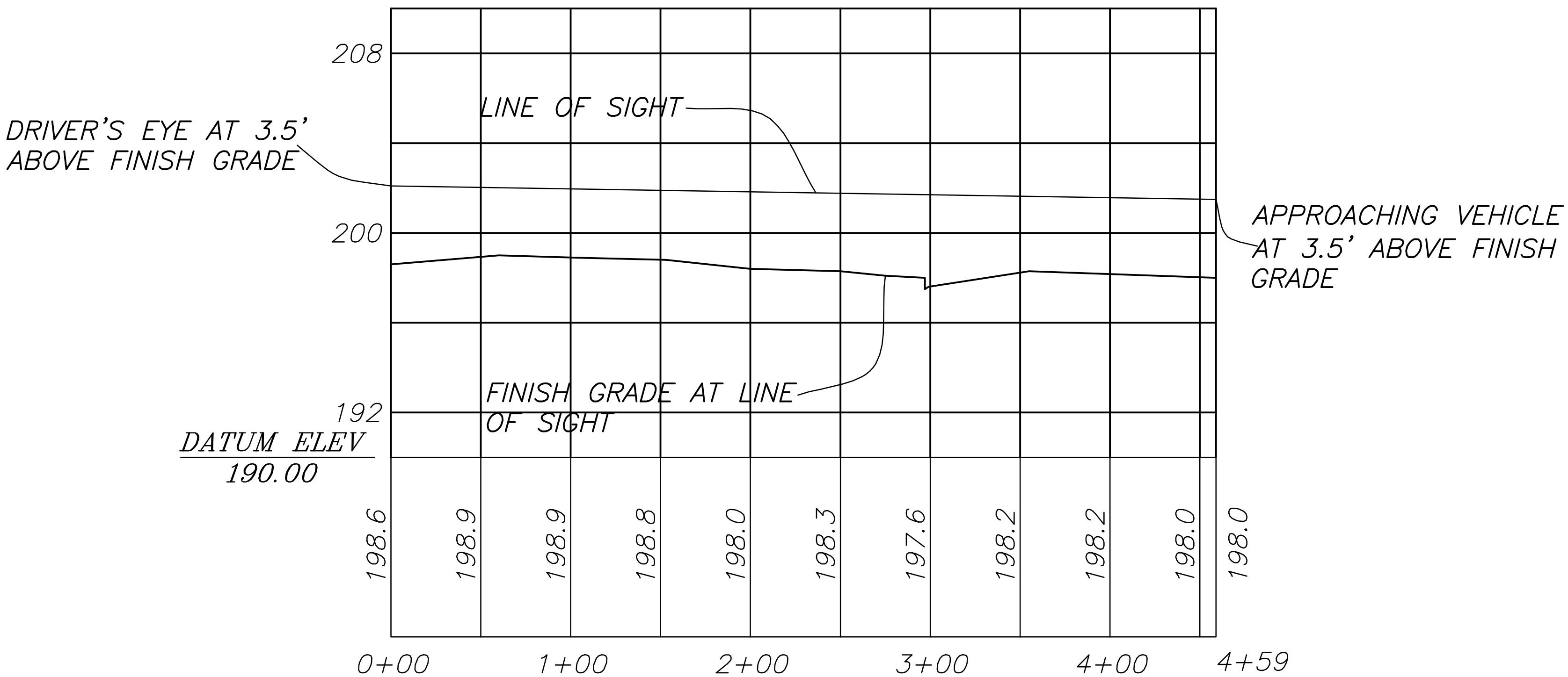
Phone: (619) 597-2001 Fax: (619) 597-2009

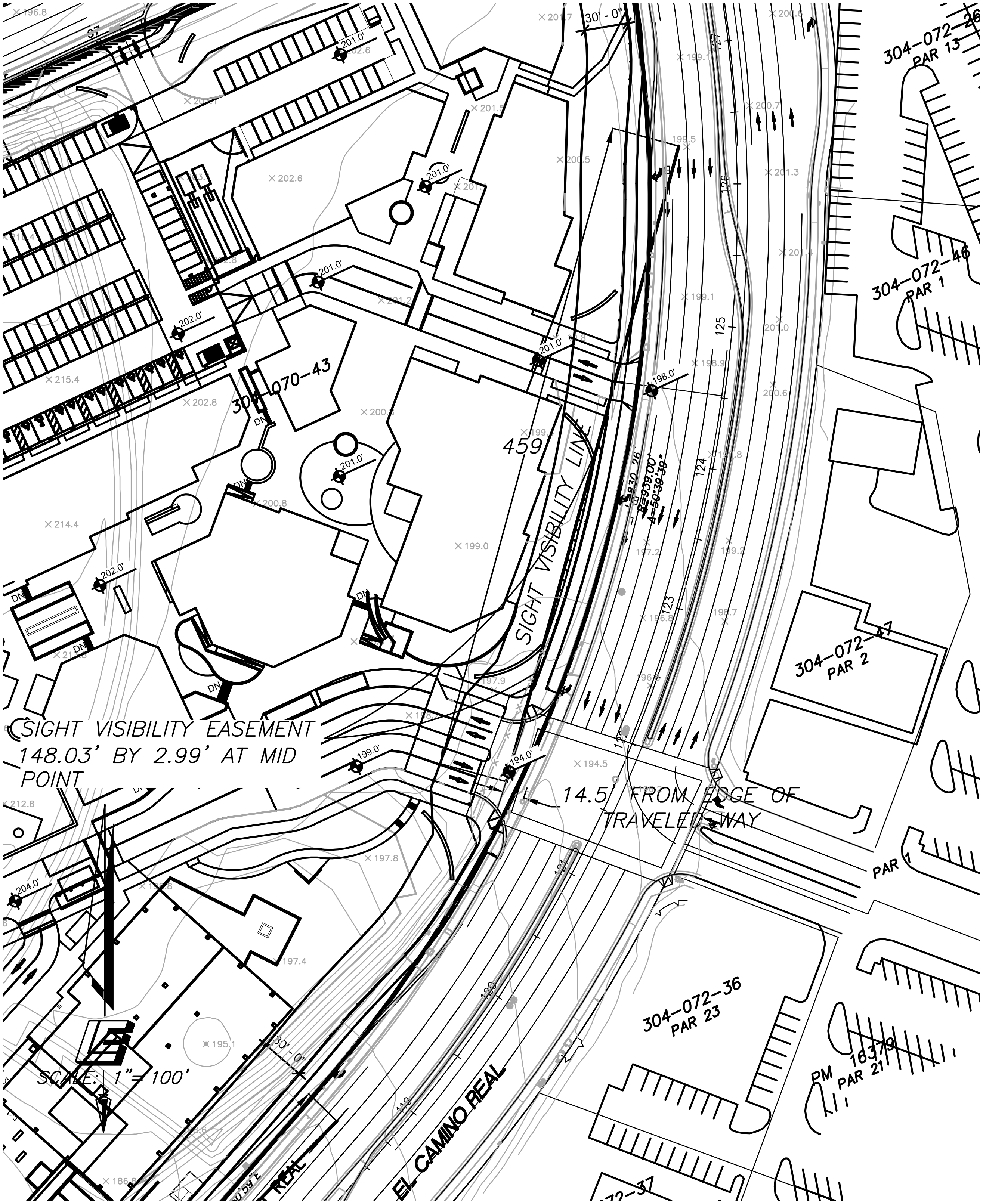
EXHIBIT A ~ SIGHT VISIBILITY AT DRIVEWAY 124+51.50



SCALE: HORIZONTAL 1" = 100'
VERTICAL 1" = 8'

Leppert Engineering CORPORATION
5190 Governor Drive, Suite 205, San Diego, Ca. 92122-2848
Phone: (619) 597-2001 Fax: (619) 597-2009

EXHIBIT B ~ SIGHT VISIBILITY AT DRIVEWAY 121+72.52



SIGHT VISIBILITY EASEMENT

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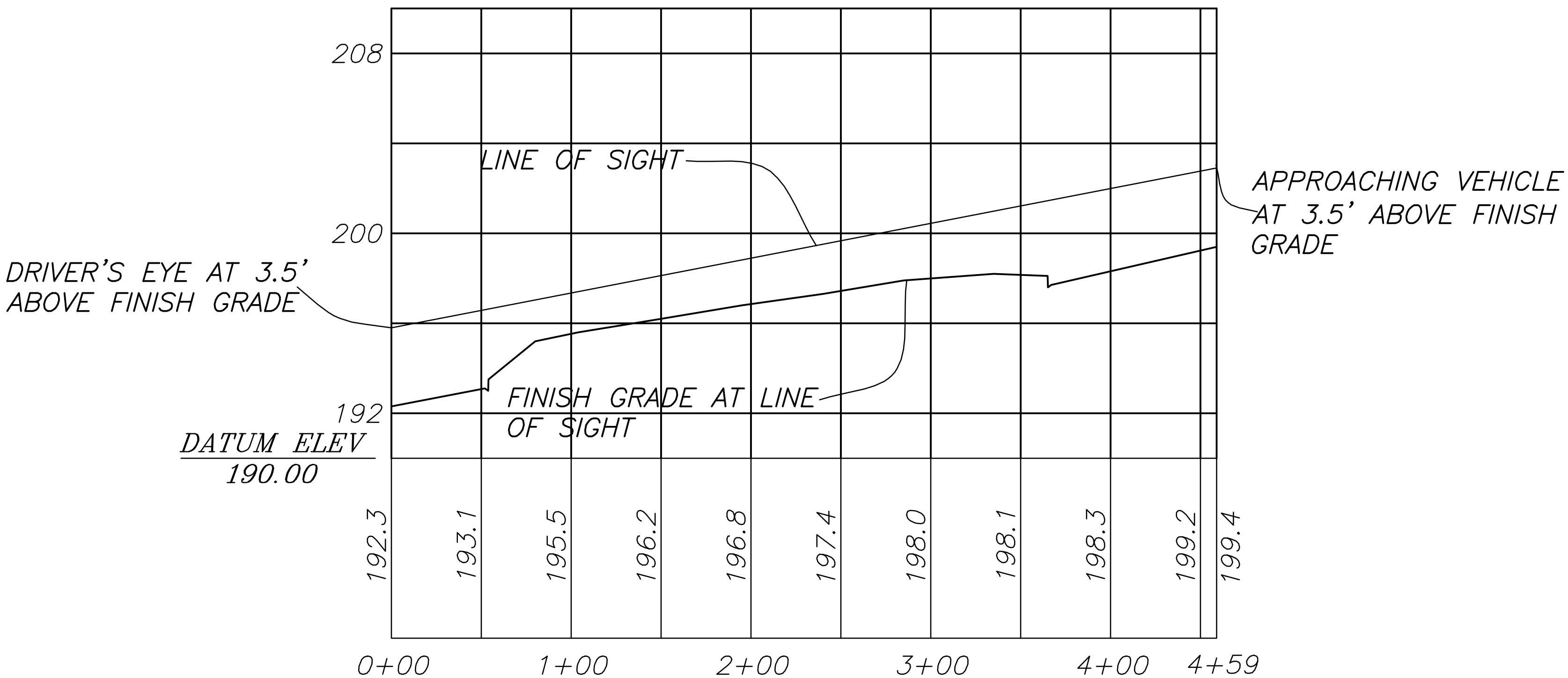
Phone: (619) 597-2001 Fax: (619) 597-2009

EXHIBIT B ~ SIGHT VISIBILITY AT DRIVEWAY 121+72.52



SCALE: HORIZONTAL1" = 100'
VERTICAL 1" = 8'

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EXHIBIT C ~ SIGHT VISIBILITY AT DRIVEWAY 116+73.24

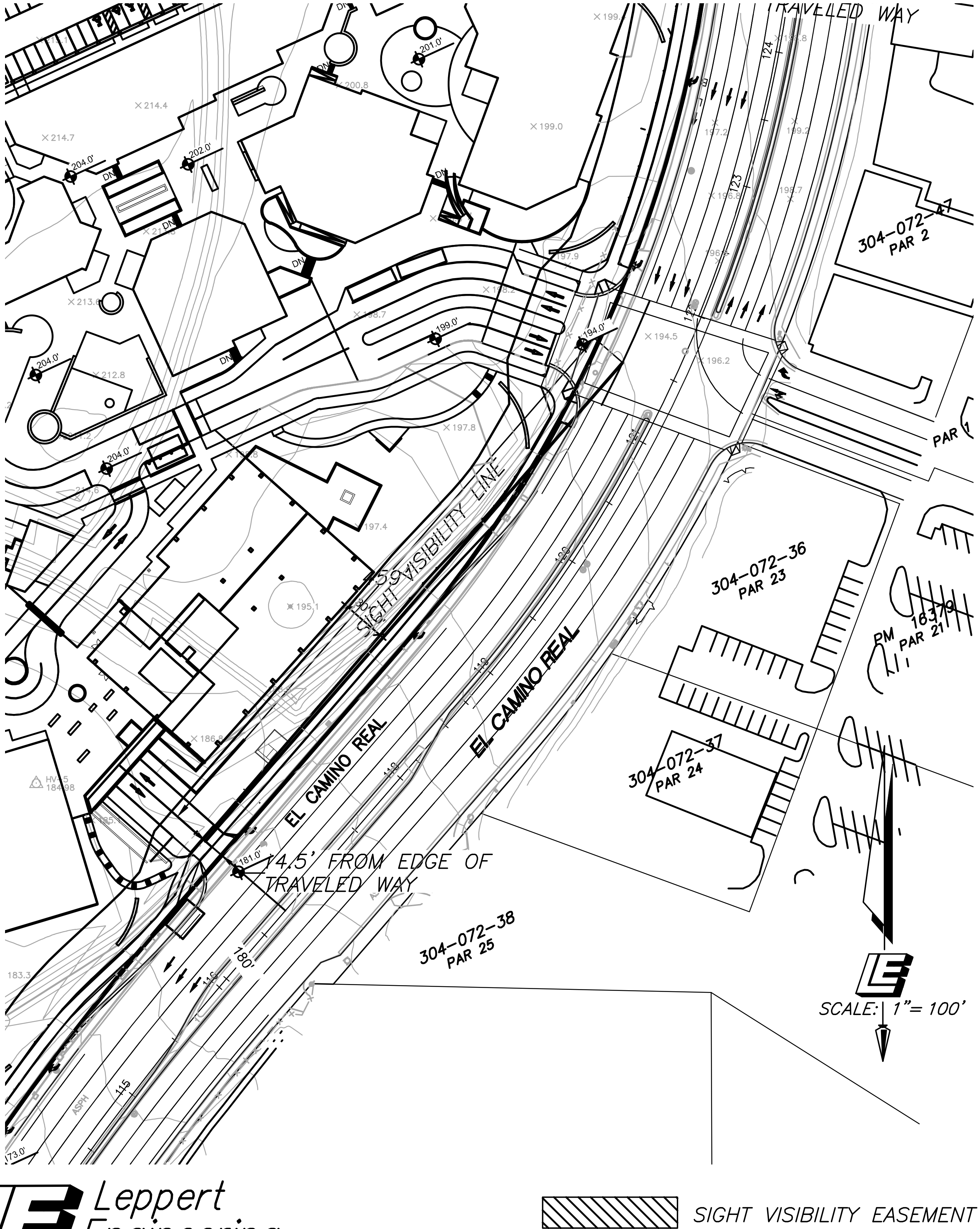

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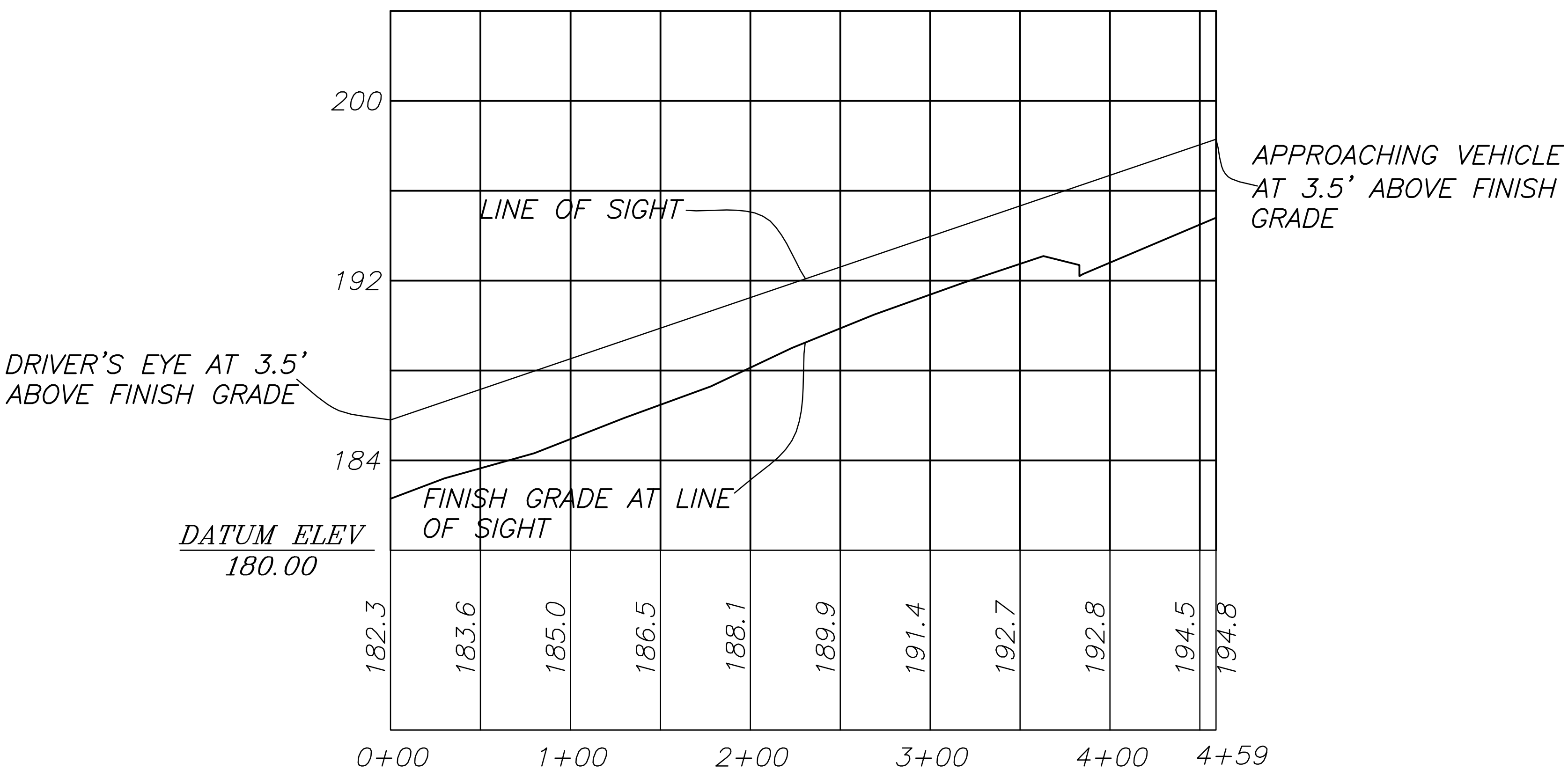
EXHIBIT C ~ SIGHT VISIBILITY AT DRIVEWAY 116+73.24



SCALE: HORIZONTAL 1" = 100'
VERTICAL 1" = 8'

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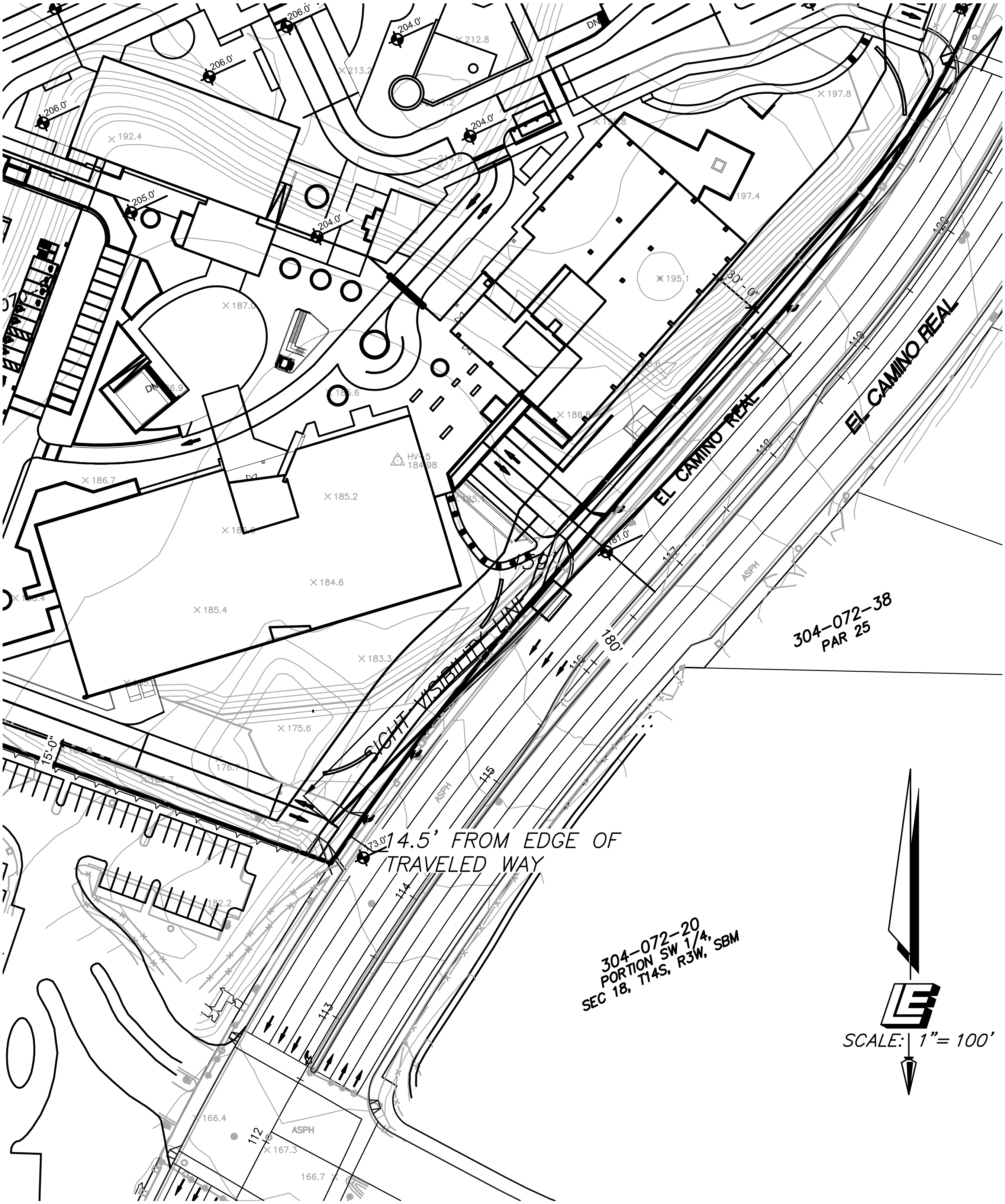
EXHIBIT D ~ SIGHT VISIBILITY AT DRIVEWAY 114+11.58



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SIGHT VISIBILITY EASEMENT

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December 2, 2015 KIL-03

Martha Blake
Development Services Department
City of San Diego
1223 First Avenue
San Diego, CA 92101

Subject: Addendum #2 to the Acoustical Analysis included in the Final Environmental Impact Report for the One Paseo Project

Dear Ms. Blake:

This Addendum has been prepared to discuss how the changes included in the New One Paseo Project relate to the results and conclusions made in the Acoustical Report prepared for the Originally Proposed Project, dated March 2012, and the subsequent Addendum dated February 2013 prepared for Reduced Main Street Alternative included as Appendices F and F.1, respectively, in the Final Environmental Impact Report (FEIR). . In addition, this Addendum evaluates the noise mitigation measures included in the adopted Mitigation Monitoring and Reporting Program (MMRP) to confirm their applicability to the current development proposal.

INTRODUCTION

In February 2015, the City Council approved a development proposal that reflected the Reduced Main Street Alternative included in the FEIR. The City Council subsequently rescinded some of the project approvals at the request of Kilroy to provide an opportunity to address local community concerns. Kilroy has revised the development proposal to reduce the scale of the project. The redesigned project is referred to as the “New One Paseo Project”. The focus of this Addendum is to confirm that the analysis and conclusions contained in the original report (Appendix G of the FEIR) for the One Paseo Project remain applicable to the New One Paseo Project.

BACKGROUND

The original report evaluated a development proposal consisting of 1,857,444 gross square feet (gsf) including residential, retail, office and hotel uses. For purposes of this Addendum, this development proposal is referred to as the "Originally Proposed Project". Subsequent to the preparation of the Draft EIR (DEIR), Kilroy redesigned the project to reduce the development to 1,454,069 gsf. The major changes included elimination of the hotel, reduction in square footage of residential, retail and office uses, and the addition of a green space. An analysis of this redesigned project was included in the EIR as the "Reduced Main Street Alternative", which was ultimately approved by the City; this project is referred to as the "Approved Project". An Addendum, dated May 5, 2014, to the original Air Quality/GHG report was prepared to address the Reduced Main Street Alternative; that Addendum is included in the Final EIR (FEIR) as Appendix G.1.

Subsequent to the approval of the Approved Project, Kilroy has redesigned the development proposal to further reduce the total size of the project to 1,175,871 gsf. More information on the New One Paseo Project is included in the project description section which follows.

PROJECT DESCRIPTION

The New One Paseo Project retains the residential, retail and office uses, but eliminates the cinema and green space that was included in the Approved Project. The total number of residential units would remain 608. However, the square footage of retail and office uses would be reduced from both the Originally Proposed Project and the Approved Project. Table 1 and Figure 1 illustrate the land uses included in the New One Paseo Project.

Table 1
NEW ONE PASEO LAND USES

Land Use	Gross Square Footage	Number of Units
Office (Multi-tenant)	280,000	--
Retail	95,871	--
Residential	800,000	608
TOTAL	**1,175,871**	**608**

A comparison of the land uses included in the New One Paseo Project with the Approved Project and the Original Project is included in Table 2. With respect to the Originally Proposed Project, the New One Paseo Project would result in a 50 percent reduction in the amount of office space, and a 64 percent reduction in the amount of retail space. The number of residential units would remain unchanged. The hotel would be eliminated. The overall square footage would decrease by 37 percent from 1,857,440 to 1,175,871 gsf.

When compared with the Approved Project, the New One Paseo Project would reduce the office space by 43 percent. The retail component would be reduced by 61 percent. The green space would be eliminated. Overall the total square footage of the development would be reduced by 19 percent from 1,454,069 to 1,175,871 gsf. The number of residential units would be unchanged.

Table 2
LAND USE COMPARISON OF THE NEW ONE PASEO PROJECT WITH THE ORIGINALLY PROPOSED PROJECT AND REVISED PROJECT
(Gross Square Feet)

Project	Commercial Retail (Square Feet)		Commercial Office (Square Feet)			Hotel (Square Feet)	Green space (Square Feet)	Multi-Family Residential (Dwelling Units)		Total
	Retail	Cinema	Corporate[1]	Professional[2]	Multi-tenant			Units	Square Feet	Square Feet
Originally Proposed Project	220,000	50,000	535,600	21,840	0	100,000	0	608	930,000	1,857,440
Approved Project	198,500	48,000	471,000	21,840	0	0	47,916	608	714,729	1,454,069
New One Paseo Project	95,871	0	0	0	280,000	0	0	608	800,000	1,175,871
Net Change from Originally Proposed Project	**-124,129**	**-50,000**	**-535,600**	**-21,840**	**+280,000**	**-100,000**	**0**	**0**	**-130,000**	**-681,569**
Net Change from Approved Project	**-102,629**	**-48,000**	**-471,000**	**-21,840**	**+280,000**	**0**	**-47,916**	**0**	**+85,271**	**-278,198**

[1] Corporate office category includes multi-tenant as well as corporate office uses.
[2] Professional office category was applied to multi-tenant office associated with Main Street.

IMPACT ANALYSIS

Project Noise

FEIR

The acoustical analysis in the FEIR concluded that the Originally Proposed and Approved Projects would result in potentially significant impacts on land uses within the proposed development, including noise sensitive receptors associated with the proposed hotel, office and residential uses. The specific noise-generators included refrigeration and freezer condensers (associated with markets and restaurants), trash compactors, forklifts, delivery trucks, amplification systems (nighttime entertainment), restaurant kitchen fans, heating, ventilation and air conditioning equipment, and parking lot traffic. Impacts on adjacent land uses were determined not to be significant.

The FEIR identified mitigation measures that would reduce significant impacts on noise sensitive receptors to less than significant. Mitigation Measure 5.4-1 requires a noise analysis prior to issuance of building permits to assure that stationary noise sources would be equipped with noise attenuation measures to keep noise to within the property line limits established by the Noise Control Ordinance. Mitigation Measure 5.4-2 requires a noise analysis prior to issuance of building permits to assess off-site noise sources to assure that noise attenuation measures are undertaken to achieve acceptable noise levels. Mitigation Measure 5.4-3 requires a noise analysis prior to issuance of building permits to assess on-site noise sources to assure that noise attenuation measures are undertaken to achieve acceptable noise levels.

New One Paseo Project

The New One Paseo Project would have similar stationary noise sources as the Originally Proposed Project and the Approved Project. Similar to the Originally Proposed and Approved Projects, implementation of Mitigation Measures 5.4-1 through 5.4-3 would reduce potential impacts for the New One Paseo Project to less than significant levels. Thus, the conclusion of the FEIR that stationary noise source impacts would be less than significant with mitigations incorporated would also apply to the New One Paseo Project.

Traffic Noise

FEIR

The FEIR concluded that future traffic noise along Del Mar Heights Road and El Camino Real would cause exterior noise levels on the project site along these roadways to exceed 65 dBA. Noise levels over 65 dBA are considered incompatible with outdoor common areas associated with multi-family residential uses. In addition exterior noise levels over 65 dBA result in interior noise levels in excess of the 45 dBA standard established by the City's General Plan without additional attenuation. With respect to the Approved Project, the analysis concluded that the green space associated with the Approved Project would also experience unacceptable traffic noise levels. As a result, traffic noise impacts were found to be significant for both the Originally Proposed and Approved Projects.

The FEIR concluded that implementation of Mitigation Measure 5.4-2 would reduce traffic noise impacts associated with both the Originally Propose and the Approved Projects to less than significant. Implementation of Mitigation Measure 12.9-1 would reduce the traffic noise impacts on the green space proposed in the Approved Project to less than significant levels.

<u>New One Paseo Project</u>

Although the New One Paseo Project would contribute less traffic to Del Mar Heights Road and El Camino Real, traffic noise from these roadways would still have a potentially significant impact on adjacent residential and office uses within the Project. However, with the elimination of the green space, impacts on recreational areas would be avoided. As such, due to the project design changes in the New One Paseo Project removing the green space, Mitigation Measure 12.9-1 would no longer be necessary, and should be removed from the adopted MMRP. Thus, the conclusion of the FEIR that traffic noise impacts would be less than significant with mitigation incorporated would also apply to the New One Paseo Project.

Construction Noise

<u>FEIR</u>

The FEIR concluded that construction noise generated during Phase 3 of the Originally Proposed and Approved Projects would significantly impact on-site residential uses constructed in previous phases. Off-site uses were determined not to be impacted.

Mitigation Measure 5.4-4, included in the FEIR, requires noise attenuation for construction in Phase 3 including modifications to construction equipment and/or construction of temporary barriers. With implementation of this mitigation measure, the FEIR concluded that the impacts of Phase 3 construction noise associated with both the Originally Proposed Project and the Approved Project would be less than significant with mitigation incorporated.

<u>New One Paseo Project</u>

As the potential exists for grading to occur adjacent to occupied residential units within the project area, construction noise could adversely impact noise sensitive uses on-site. As with the Originally Proposed and Approved Projects, implementation of Mitigation Measure 5.4.4, as appropriate, would reduce the impact to less than significant.

CONCLUSION

Overall, the New One Paseo project would result in reduction of the square footage and ADT in comparison with the Originally Proposed Project and the Approved Project, and change in project design to remove the green space proposed in the Approved Project. As such, with implementation of Mitigation Measures 5.4-1, 5.4-2, 5.4-3 and 5.4-4 that were proposed in the FEIR, the New One Paseo project will not create new significant environmental effects from noise, or a substantial increase in the severity of a previously identified impacts; and therefore, the previous analysis and conclusions remain valid. Additionally, due to removal of the green space from project design elements, Mitigation Measure 12.9-1, which mitigated unacceptable noise levels in the green space, is no longer necessary for the New One Paseo Project and should be removed from the adopted MMRP.

CERTIFICATION

This addendum is based on the related project information received and represents a true and factual analysis of the acoustical impact issues associated with the New One Paseo Project.

Sincerely,

Charles Terry
Senior Noise Specialist

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December 2, 2015 KIL-03

Martha Blake
Development Services Department
City of San Diego
1223 First Avenue
San Diego, CA 92101

Subject: Addendum #2 to the Air Quality and Greenhouse Gas Analysis included in the Final Environmental Impact Report for the One Paseo Project

Dear Ms. Blake:

This Addendum has been prepared to discuss how the changes included in the New One Paseo Project relate to the results and conclusions made in the Air Quality and Greenhouse Gas Report prepared for the Originally Proposed Project, dated March 2012, and the subsequent Addendum dated May 5, 2014 prepared for Reduced Main Street Alternative included as Appendices G and G.1, respectively, in the Final Environmental Impact Report (FEIR).

INTRODUCTION

In February 2015, the City Council approved a development proposal that reflected the Reduced Main Street Alternative included in the FEIR. The City Council subsequently rescinded some of the project approvals at the request of Kilroy to provide an opportunity to address local community concerns. Kilroy has revised the development proposal to reduce the scale of the project. The redesigned project is referred to as the "New One Paseo Project". The focus of this Addendum is to confirm that the analysis and conclusions contained in the original report (Appendix G of the FEIR) for the One Paseo Project remain applicable to the New One Paseo Project.

BACKGROUND

The original report evaluated a development proposal consisting of 1,857,444 gross square feet (gsf) including residential, retail, office and hotel uses. For purposes of this Addendum, this development proposal is referred to as the "Originally Proposed Project". Subsequent to the preparation of the Draft EIR (DEIR), Kilroy redesigned the project to reduce the development to 1,454,069 gsf. The major changes included elimination of the hotel, reduction in square footage of residential, retail and office uses, and the addition of a green space. An analysis of this redesigned project was included in the EIR as the “Reduced Main Street Alternative”, which was ultimately approved by the City; this project is referred to as the “Approved Project”. An Addendum, dated May 5, 2014, to the original Air Quality/GHG report was prepared to address the Reduced Main Street Alternative; that Addendum is included in the Final EIR (FEIR) as Appendix G.1.

Subsequent to the approval of the Approved Project, Kilroy has redesigned the development proposal to further reduce the total size of the project to 1,175,871 gsf. More information on the New One Paseo Project is included in the project description section which follows.

PROJECT DESCRIPTION

The New One Paseo Project retains the residential, retail and office uses, but eliminates the green space that was included in the Approved Project. The total number of residential units would remain 608. However, the square footage of retail and office uses would be reduced from both the Originally Proposed Project and the Approved Project. Table 1 and Figure 1 illustrate the land uses included in the New One Paseo Project.

Table 1. New One Paseo Land Uses

Land Use	Gross Square Footage	Number of Units
Office (Multi-tenant)	280,000	--
Retail	95,871	--
Residential	800,000	608
Total	**1,175,871**	**608**

A comparison of the land uses included in the New One Paseo Project with the Approved Project and the Originally Proposed Project is included in Table 2. With respect to the Originally Proposed Project, the New One Paseo Project would result in a 50 percent reduction in the amount of office space, and a 64 percent reduction in the amount of retail space. The number of residential units would remain unchanged. The hotel would be eliminated. The overall square footage would decrease by 37 percent from 1,857,440 to 1,175,871 gsf.

When compared with the Approved Project, the New One Paseo Project would reduce the office space by 43 percent. The retail component would be reduced by 61 percent. The green space would be eliminated. Overall the total square footage of the development would be reduced by 19 percent from 1,454,069 to 1,175,871 gsf. The number of residential units would remain unchanged.

Table 2
Land Use Comparison of the New One Paseo Project with the Originally Proposed Project and Revised Project (Gross Square Feet)

Project	Commercial Retail (Square Feet)		Commercial Office (Square Feet)			Hotel (Square Feet)	Green Space (Square Feet)	Multi-Family Residential (Dwelling Units)		Total
	Retail	Cinema	Corporate[1]	Professional[2]	Multi-tenant			Units	Square Feet	Square Feet
Originally Proposed Project	220,000	50,000	535,600	21,840	0	100,000	0	608	930,000	1,857,440
Approved Project	198,500	48,000	471,000	21,840	0	0	47,916	608	714,729	1,454,069
New One Paseo Project	95,871	0	0	0	280,000	0	0	608	800,000	1,175,871
Net Change from Originally Proposed Project)	**-124,129**	**-50,000**	**-535,600**	**-21,840**	**+280,000**	**-100,000**	**0**	**0**	**-130,000**	**-681,569**
Net Change from Approved Project	**-102,629**	**-48,000**	**-471,000**	**-21,840**	**+280,000**	**0**	**-47,916**	**0**	**+85,271**	**-278,198**

[1] Corporate office category includes multi-tenant as well as corporate office uses.

[2] Professional office category was applied to multi-tenant office associated with Main Street.

IMPACT ANALYSIS

Air Quality Planning

FEIR

The analysis for the Originally Proposed Project and the Approved Project determined that although the project would require a Community Plan Amendment (CPA) and Precise Plan Amendment (PPA) to allow for the proposed land uses, construction and operational air emissions generated by the project would not exceed applicable significance thresholds for ozone precursors or particulate matter. Project design features were proposed to reduce project emissions in compliance with the strategies in the Regional Air Quality Strategy (RAQS) and State Implementation Plan (SIP) for attaining and maintaining air quality standards. As a result the air quality analysis concluded the impact of the Originally Proposed or Approved Project on regional air quality planning would be less than significant.

New One Paseo Project

The RAQS relies on information from the California Air Resources Board (CARB) and San Diego Association of Governments (SANDAG), including projected growth in the County, mobile, area and all other source emissions in order to project future emissions and determine from that the strategies necessary for the reduction of stationary source emissions through regulatory controls. The CARB mobile source emission projections and SANDAG growth projections are based on population and vehicle trends and land use plans developed by the cities and by the County. As such, projects that propose development that is consistent with the growth anticipated by the general plans would be consistent with the RAQS. In the event that a project proposes development which is less dense than anticipated within the General Plan, the project would likewise be consistent with the RAQS. As illustrated previously in Table 2, the New One Paseo Project would result in a 37 percent decrease in overall gsf when compared to the Originally Proposed Project and a 19 percent decrease when compared to the Approved Project. As such, the New One Paseo Project proposes development that is less dense than the previously analyzed projects. As a result the FEIR conclusion that the impact of development of the Originally Proposed or Approved Projects on regional air quality planning would be less than significant would also be applicable to the New One Paseo Project.

Criteria Pollutants

FEIR

Construction

The analysis for the Originally Proposed Project, included as Appendix G to the FEIR, concluded that construction activities associated with the Originally Proposed Project would not result in significant air quality impacts related to criteria pollutants. The analysis for the Approved Project, included as Appendix G.1 to the FEIR, concluded that the generation of criteria pollutants, GHGs, and diesel particulates during construction from the Approved Project would be comparable to that of the Originally Proposed Project because the emission levels are based on the surface area to be graded and the number of pieces of construction equipment operating at any given time. The construction impacts with respect to criteria pollutants of both projects was determined to be less than significant.

Operation

The analysis for the Originally Proposed Project concluded that operations would not result in significant air quality impacts related to criteria pollutants. The analysis for the Approved Project concluded that due to the reduced square footage, the Approved Project would reduce average daily vehicle trips (ADT) by approximately 13 percent when compared to the Originally Proposed Project, as well as reduce the demand for energy. As such, it was determined that the Approved Project would result in lower emissions of criteria pollutants than the Originally Proposed Project. The operation impacts with respect to criteria pollutants of both projects was determined to be less than significant.

<u>New One Paseo Project</u>

Construction

As the construction area and activity associated with the New One Paseo Project would be similar or less than the Originally Proposed and Approved Projects, the conclusion of the FEIR air quality analysis that construction impacts on air quality would be less than significant would also be applicable to the New One Paseo Project.

Operation

As detailed in the Traffic Analysis Addendum for the New One Paseo Project, the New One Paseo Project would further reduce ADT by approximately 43 percent when compared to the Approved Project. This equates to an overall ADT reduction of approximately 50 percent when compared to the Originally Proposed Project. Furthermore, the New One Paseo Project would result in reduced energy demand due to the reduced square footage detailed in Table 2. As such, the New One Paseo Project would result in lower emissions of criteria pollutants than either the Originally Proposed Project or Approved Project. Therefore, the conclusions of the FEIR air quality analysis that operational impacts would be less than significant would also be applicable to the New One Paseo Project.

Sensitive Receptors

FEIR

Construction

The analysis for the Originally Proposed Project concluded that construction activities would not result in significant air quality impacts related to diesel particulates. As with criteria pollutants, the similar construction equipment usage was assumed for the Approved Project which was also determined to have a less than significant impact on sensitive receptors.

Operation

The analysis for the Originally Proposed Project concluded that operations would not result in significant levels of toxic air contaminants (TACs) related to diesel particulates and heating and ventilation associated with operations of the proposed development. The analysis for the Approved Project concluded that the reduced square footage of buildings requiring heating and ventilation would result in a proportional reduction in TACs associated with this source when compared to the Originally Proposed Project. Additionally, the reduction in retail development associated with the Approved Project would reduce the number of trucks providing deliveries, which would proportionately reduce diesel particulate emissions.

New One Paseo Project

Construction

As the construction area and activity associated with the New One Paseo Project would be similar or less than the Originally Proposed and Approved Projects, the FEIR conclusion that the impact of development on sensitive receptors would be less than significant would also be applicable to the New One Paseo Project.

Operation

The reduced square footage of development for the New One Paseo Project would result in a proportional reduction in TACs and diesel particulate emissions. Therefore, the FEIR conclusion that operations related to development of the property would have a less than significant impact on sensitive receptors would remain applicable to the New One Paseo Project.

Odors

FEIR

Construction Odors

The analysis for the Originally Proposed Project stated that project construction would not cause a long-term odor nuisance, and associated odor impacts during project construction would be less than significant. As with previous issues, the similar construction equipment usage under the Approved Project would generate odors comparable to the Originally Proposed Project. Odor impacts were determined to be less than significant for both projects.

Operational Odor Impacts

The analysis concluded that land uses associated with the Originally Proposed and Approved Projects would not result in objectionable odors and that odor impacts would be less than significant.

New One Paseo Project

Construction Odors

Construction associated with the New One Paseo Project would be comparable to the Originally Proposed and Approved Projects. Thus, the FEIR conclusion that construction odors would be less than significant would also be applicable to the New One Paseo Project.

Operational Odors

As land uses would be comparable to the Originally Proposed and Approved Projects, the FEIR conclusion that operational odors would be less than significant would also be applicable to the New One Paseo Project.

Greenhouse Gas Emissions

FEIR

Construction

The analysis for the Originally Proposed Project, included as Appendix G to the FEIR, concluded that construction activities associated with the Originally Proposed Project would not result in significant GHG emissions. The analysis for the Approved Project, included as Appendix G.1 to the FEIR, concluded that the generation of GHGs during construction would be comparable to that of the Originally Proposed Project because the emission levels are based on the surface area to be graded and the number of pieces of construction equipment operating at

any given time. As result, the analysis concluded that the GHG impacts associated with construction for the Originally Proposed and Approved Project would be less than significant.
Operation

The analysis for the Originally Proposed Project concluded that operations would not result in significant GHG emissions. The analysis for the Approved Project concluded that due to the reduced square footage, the Approved Project would reduce ADT by approximately 13 percent when compared to the Originally Proposed Project, as well as reduce the demand for energy. As such, it was determined that the Approved Project would result in lower GHG emissions than the Originally Proposed Project. As a result, the analysis concluded that the GHG impacts associated with operations for the Originally Proposed and Approved Project would be less than significant.

New One Paseo Project

Construction

The construction associated with the New One Paseo Project would be comparable or less than that associated with the Originally Proposed and Approved Projects. Thus, the conclusion that GHG emissions related to construction would be less than significant would be applicable to the New One Paseo Project.

Operations

As detailed in the Traffic Analysis Addendum for the New One Paseo Project, the New One Paseo Project would further reduce ADT by approximately 43 percent when compared to the Approved Project. This equates to an overall ADT reduction of approximately 50 percent when compared to the Originally Proposed Project. Furthermore, the New One Paseo Project would result in reduced energy demand due to the reduced square footage detailed in Table 2. As such, the New One Paseo Project would result in lower GHG emissions than either the Originally Proposed Project or Approved Project. Thus, the FEIR conclusion that GHG emissions related to operations would be less than significant would also be applicable to the New One Paseo Project.

Greenhouse Gas Planning

FEIR

The analysis for the Originally Proposed Project determined that because the Project is expected to include project features that are encouraged by the Conservation Element policies in the City's General Plan, there would be no conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. This was also determined to be true for the Approved Project which also incorporated energy conservation features.

<u>New One Paseo Project</u>

The New One Paseo Project would also include energy conservation features. Therefore, the FEIR conclusion that the impact of development GHG reduction policies would be less than significant would also be applicable to the New One Paseo Project.

CONCLUSION

Overall, the New One Paseo project would result in reduction of the square footage of the project and ADT in comparison with the Originally Proposed Project and the Approved Project analyzed in the FEIR. As such, the New One Paseo project will not create new significant environmental effects for air quality and GHG, or a substantial increase in the severity of a previously identified impact; and therefore, the previous analysis and conclusions remain valid.

CERTIFICATION

This addendum is based on the related project information received and represents a true and factual analysis of the air quality and greenhouse gas impact issues associated with the New One Paseo Project.

Sincerely,

Victor Ortiz
Air Quality Specialist

DRAINAGE STUDY
FOR
One Paseo

PTS No. 451328, I.O. No. 24000155
October 16, 2015

Prepared By:
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C 26283
CIVIL
STATE OF CALIFORNIA

12/3/2015
Date

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Exhibits

Appendices

Introduction

This Addendum addresses a revised development proposal for the One Paseo project, which was approved in February 2015. This project is referred to as the "Approved Project". The City Council subsequently rescinded some of the project approvals at the request of Kilroy to provide an opportunity to address local community concerns. The redesigned project is referred to as "New One Paseo Project". The focus of this Addendum is to determine whether the analysis and conclusions contained in the original report (Appendix H of the Final Environmental Impact Report [FEIR]) for the One Paseo Project remain applicable to the New One Paseo Project.

Background

The original report evaluated a development proposal consisting of 1,857,444 gross square feet (gsf) including residential, retail, office and hotel uses. For purposes of this Addendum, this development proposal is referred to the "Originally Proposed Project". Subsequent to the preparation of the original report, Kilroy redesigned the project to reduce the development to 1,454,069 gsf. The major changes included elimination of the hotel, reduction in square footage of residential, retail and office uses, and the addition of a green space. An analysis of this redesigned project was included in the EIR as the "Reduced Main Street Alternative" (also referred to as the "Approved Project").

Subsequent to the approval of the Approved Project, Kilroy has redesigned the development proposal to further reduce the total size of the project to 1,175,871 gsf. More information on the New One Paseo Project is included in the project description section of this Addendum.

Project Description

The New One Paseo Project retains the residential, retail and office uses, but eliminates the green space that was included in the Approved Project. The total number of residential units would remain 608. However, the square footage of retail and office uses would be reduced from both the Originally Proposed Project and the Approved Project. Table 1 and Figure 1 illustrate the land uses included in the New One Paseo Project.

Table 1. Land Uses

Land Use	Gross Square Footage	Number of Units
Office (Multi-tenant)	280,000	--
Retail	95,871	--
Residential	800,000	608
Total	**1,175,871**	**608**

A comparison of the land uses included in the New One Paseo Project with the Approved Project and the Originally Proposed Project is included in Table 2. With respect to the Originally Proposed Project, the New One Paseo Project would result in a 50 percent reduction in the amount of office space, and a 64 percent reduction in the amount of retail space. The number of residential units would remain unchanged. The hotel would be eliminated. The overall square footage would decrease by 37 percent from 1,857,440 to 1,175,871 gsf.

When compared with the Approved Project, the New One Paseo Project would reduce the office space by 43 percent. The retail component would be reduced by 61 percent. The green space would be eliminated. Overall the total square footage of the development would be reduced by 19 percent from 1,454,069 to 1,175,871 gsf. The number of residential units would remain unchanged.

Purpose

The purpose of this drainage study is to reanalyze the drainage design based upon the New One Paseo project. We will determine the sizing of proposed storm drains, and confirm adequacy of existing storm drains.

Project Location

The proposed project is located in the Carmel Valley area of the City of San Diego, which falls under the Miramar Reservoir Hydrologic Area (Hydrologic Sub-area 906.10) of the Peñasquitos Hydrologic unit. The project site is on the southwest corner of the intersection of El Camino Real and Del Mar Heights Road, just east of interstate 5, in the City of San Diego (see Exhibit A).

Method of Calculation

This study calculates the total runoff from the site using the guidelines set forth in the City of San Diego's Drainage Design Manual, dated April 1984 (see Appendix I – Rational Method: City of San Diego Drainage Design Manual). The specific method used is the Rational Formula for watersheds under 0.5 square miles. A 100 year storm event was used for the analysis. Per the City of San Diego Drainage Design Manual, for tributary areas less than one square mile the storm drain system shall be designed so that the combination of storm drain system capacity and overflow will be able to carry the 100-year frequency storm without damage to or flooding of adjacent existing buildings or potential building sites, and Type D soil shall be used for all areas (see Appendix II– Runoff Coefficients: City of San Diego Drainage Design Manual).

Autodesk Storm and Sanitary Analysis was used for the storm analysis. Autodesk Storm and Sanitary Analysis is a link-node based model that performs hydrology, hydraulic, and water quality analysis of storm water and wastewater drainage systems, including sewage treatment plants and water quality control devices. A link represents a hydraulic element (i.e., a pipe, channel, pump, standpipe, culvert, or weir) that transports flow and constituents. A node can represent the junction of two or more links, a storm drain catch basin inlet, the location of a flow or pollutant input into the system, or a storage element (such as a detention pond, retention pond, settling pond, or lake).

Drainage basin boundaries, flow patterns, and topographic elevations are shown on the drainage basin maps located in the map pockets (see Exhibit B – Existing Condition Drainage Basin Map & Exhibit D – Proposed Condition Basin Map).

Existing Condition

The project site located on the southwest corner of El Camino Real and Del Mar Heights Road on a previously mass graded 23.7 acre site (see Appendix VI) designated by APNs 304-070-49-00, 304-070-43-00, 304-070-52-00 & 304-070-57-00. The site is bound by High Bluff Drive to the west, Del Mar Heights Road to the north and El Camino Real to the east. All of the surrounding parcels are previously developed.

A total of eight sub-basins were analyzed. The sub-basin summary below describes each of the sub-basins and Exhibit B – Existing Condition Drainage Basin Map shows the basin boundaries.

Sub-basin A:
This area is a 2.0 acre offsite basin consisting of the westerly portion of Del Mar Heights Road fronting the project and the onsite slope adjacent to it. Drainage from this basin surface flows via gutter to the existing curb inlet located along Del Mar Heights Road just before El Camino Real.

Sub-basin B:
This area is a 1.2 acre offsite basin consisting of the easterly portion of Del Mar Heights Road fronting the project and the onsite slope adjacent to it. Drainage from this basin surface flows via gutter to the existing curb inlet located along Del Mar Heights Road just before El Camino Real.

Sub-basin C:
This area is a 8.1 acre onsite basin consisting of a previously pad graded area on the northwest corner of the site. Drainage from this basin surface flows to an existing onsite sediment basin with a 30" CMP riser.

Sub-basin D:
This area is a 3.9 acre onsite basin consisting of a previously pad graded area centered along the northerly property line of the site. Drainage from this basin surface flows to an existing onsite sediment basin with a 30" CMP riser.

Sub-basin E:
This area is a 5.8 acre onsite basin consisting of a previously pad graded area on the northeast corner of the site. Drainage from this basin surface flows to an existing onsite sediment basin with a 30" CMP riser.

Sub-basin F:
This area is a 0.4 acre offsite basin consisting of the northerly portion of El Camino Real fronting the project and the onsite slope adjacent to it. Drainage from this basin surface flows via gutter to the existing curb inlet located along El Camino Real at the intersection of Del Mar Heights Road.

Sub-basin- G:
This area is a 4.7 acre onsite basin consisting of a previously pad graded area on the southerly corner of the site. Drainage from this basin surface flows to an existing onsite sediment basin with a 30" CMP riser.

Sub-basin- H:
This area is a 2.1 acre offsite basin consisting of the southerly portion of El Camino Real fronting the project and the onsite slope adjacent to it. Drainage from this basin surface flows via gutter to the existing curb inlet located along El Camino Real just prior to the southerly property line of the project.

All the identified sub-basins enter an existing storm drain system of various sizes of RCP. The system runs from the intersection of Del Mar Heights Road and High Bluff Drive east to El Camino Real, then south down El Camino Real past the project's southern property line. The existing public storm drain system within El Camino Real was designed for the ultimate build-out of the project as described in "Drainage Study, North City West Employment Center, Entire Precise Plan Area, dated February, 1984 by Rick Engineering Company". Based on this, pre-project hydrology calculations have been performed for the project site area in order to evaluate the overall increase in runoff from the site, but not the total flow due to all upstream basin areas. A pre-project basin map has been included to identify existing watershed boundaries in Exhibit B.

Proposed Condition

The proposed condition analysis analyzes 51 sub basins as shown on Exhibit D-Proposed Condition Basin Map. The impervious percentage of the previously approved project was conservatively estimated at 90% and utilized a C value of 0.95. Per the analysis included in "Water Quality Technical Report for One Paseo", prepared by Leppert Engineering Corporation, dated October 16, 2015, the New One Paseo project site is 80% impervious. Per the City of San Diego Drainage Design Manual (see Appendix III), a land use that is 80% impervious has a C value of 0.85, so for the project site that is 80% impervious, the C value used is 0.85. This value also corresponds to a commercial use, which is appropriate considering the overall density of the proposed structures.

For all sub-basins within the site the time of concentration is assumed to be less than 5 minutes due to onsite area drains and roof drains, so the minimum time of concentration of 5 minutes was used. Intensity values were determined using the City of San Diego Drainage Design Manual Rainfall Intensity Duration Frequency Curves (see Appendix IV).

Results from the analysis can be found in Exhibit E-Proposed Condition SSA Analysis Results.

Conclusions

As compared to the existing condition, the proposed project increases the peak runoff from the site. The total peak runoff for the site is 71.31 cfs vs the existing condition 23.76 cfs, an increase of 47.55 cfs from the existing condition. Since the public storm drain within El Camino Real was designed for ultimate build-out, the results provided will be utilized to size the on-site system and points of connection into the existing 66-inch system in El Camino Real.

As compared to the previous approval, the New One Paseo project decreases the peak runoff from the site. The total peak runoff for the site is 71.31 cfs vs the previous 82.68 cfs, a decrease of 11.37 cfs from the previous approval. This can be attributed to revising the runoff coefficient from 0.95 to 0.85. Since the public storm drain within El Camino Real was designed for ultimate build-out, the results provided will be utilized to size the on-site system and points of connection into the existing 66-inch system in El Camino Real.

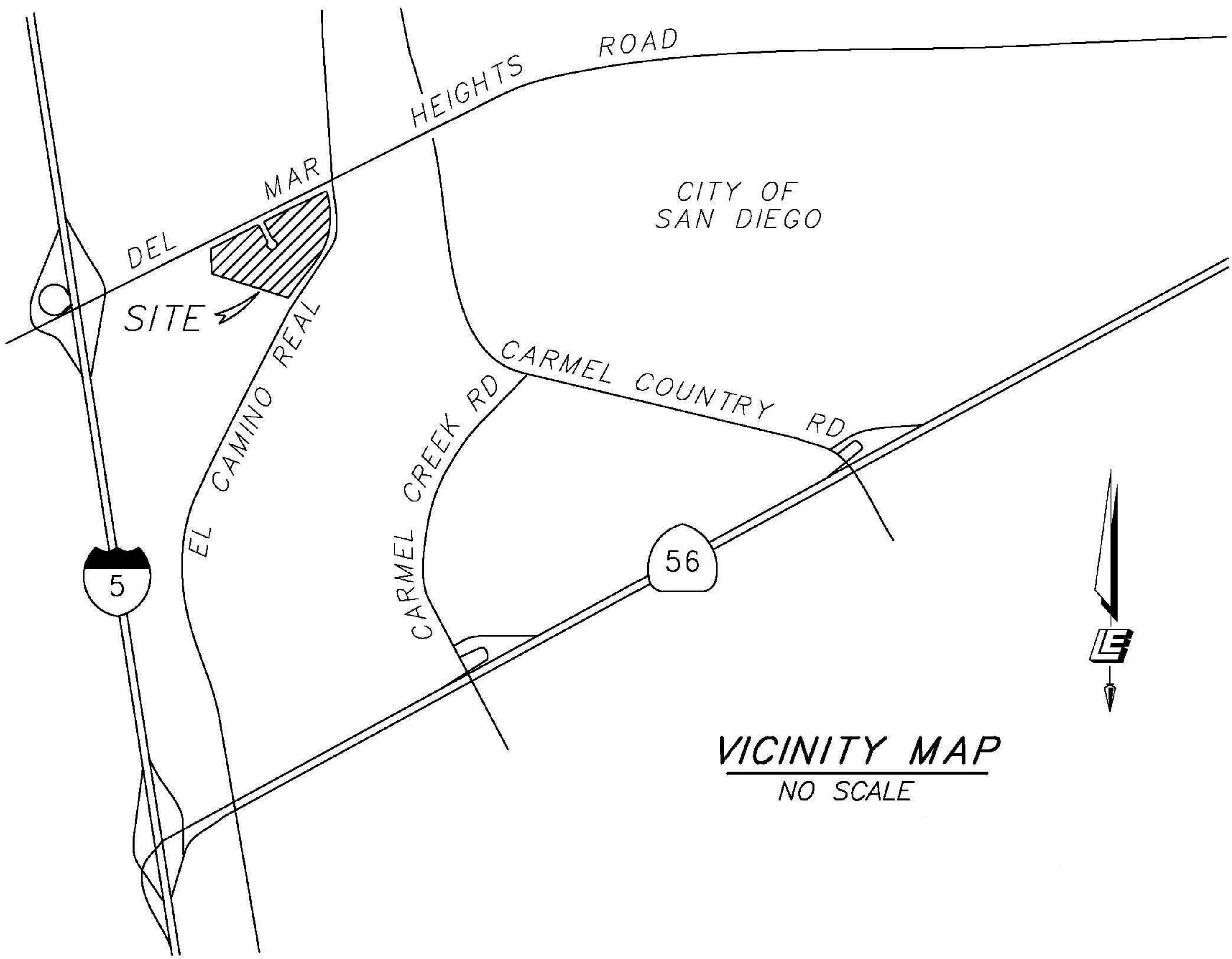
The New One Paseo results in additional impervious areas as a result of the roadway widening along both Del Mar Heights Road and El Camino Real. This will create increased run-off within the roadway for both off-site drainage areas. In the existing condition, the total offsite basin areas that contribute to the public storm drain system are Sub-A at 2.0 acres and Sub-B at 1.2 acres, respectively. However, in the proposed condition the runoff from Basin Sub-01 is conveyed through the proposed onsite storm drain system whereas in the existing condition that same area was conveyed through the public storm drain system within Del Mar Heights Road and El Camino Real. This proposed routing removes that 1.4 acre basin from the existing public storm drain system until it re-enters the public storm drain system at Jun-29. Subsequently, this will reduce the flows within the existing system upstream of the proposed points of connection, while the existing downstream has been designed for ultimate build-out. The increased impervious areas for the public street widenings, has been analyzed and mitigated in the Water Quality Technical Report.

Post-project storm water runoff will be treated per the Storm Water Standards Manual. Please refer to the report titled, Water Quality Technical Report for One Paseo" dated October 16, 2015, prepared by Leppert Engineering Corporation, for more information with regards to water quality.

As discussed above, we conclude that the New One Paseo Project would not result in any new impacts related to stormwater runoff. Nor, would the New One Paseo Project result in an increase severity in the drainage impacts identified in our original report.

EXHIBIT “A” – Location Map

EXHIBIT "A"



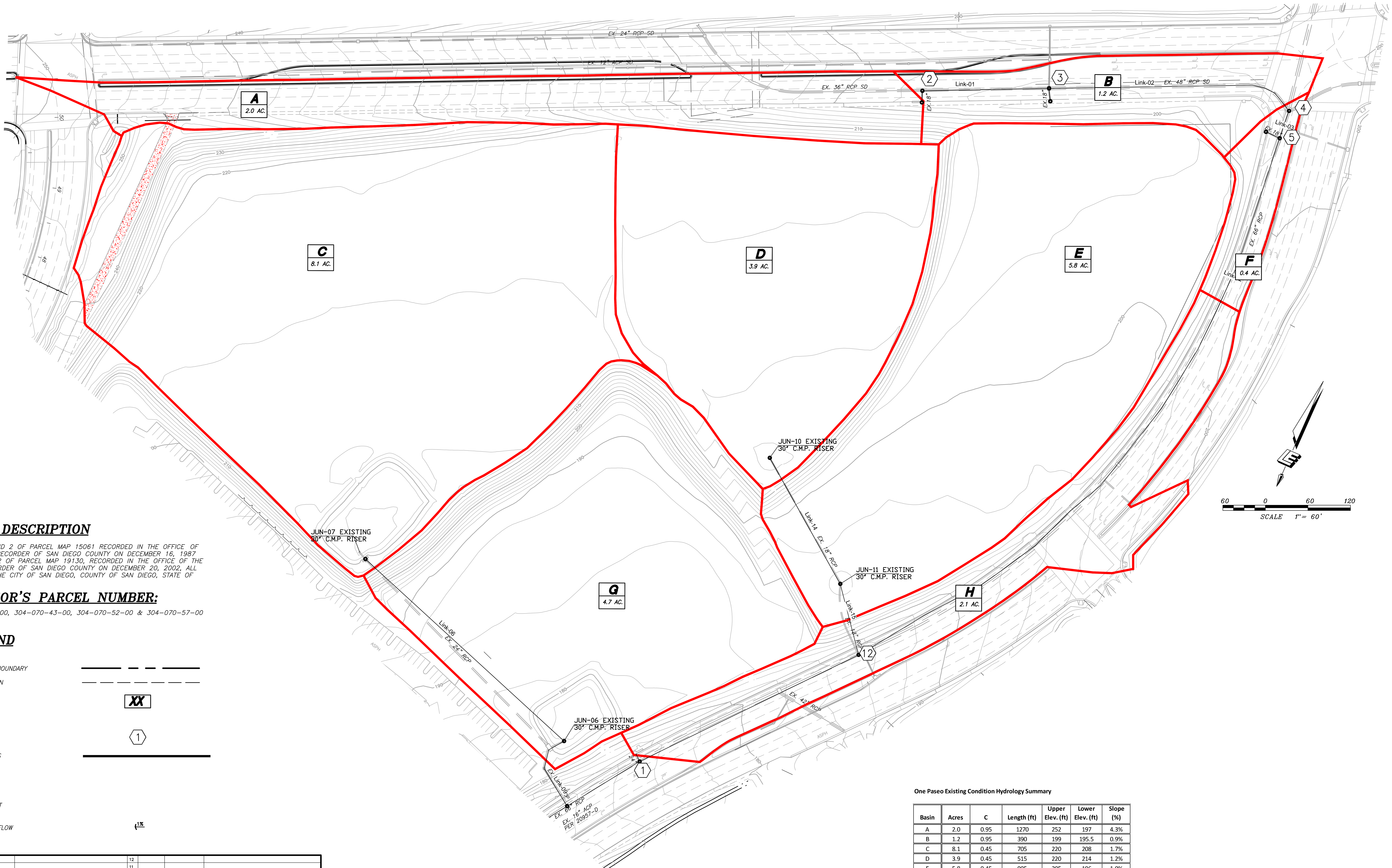
VICINITY MAP
NO SCALE

LEGAL DESCRIPTION:

PARCELS 1 AND 2 OF PARCEL MAP 15061 RECORDED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY ON DECEMBER 16, 1987 AND PARCEL 2 OF PARCEL MAP 19130, RECORDED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY ON DECEMBER 20, 2002, ALL LOCATED IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA.

LOCATION MAP
NO SCALE

EXHIBIT “B” – Existing Condition Drainage Basin Map



LEGAL DESCRIPTION

PARCELS 1 AND 2 OF PARCEL MAP 15061 RECORDED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY ON DECEMBER 16, 1987 AND PARCEL 2 OF PARCEL MAP 19130, RECORDED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY ON DECEMBER 20, 2002, ALL LOCATED IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA.

ASSESSOR'S PARCEL NUMBER:

304-070-49-00, 304-070-43-00, 304-070-52-00 & 304-070-57-00

LEGEND

PROPERTY BOUNDARY

STORM DRAIN

BASIN / AREA — XX

NODE NO. — 1

BASIN LIMITS

CURB INLET

CLEANOUT

GRATE INLET

OVERLAND FLOW — 1%

One Paseo Existing Condition Hydrology Summary

Basin	Acres	C	Length (ft)	Upper Elev. (ft)	Lower Elev. (ft)	Slope (%)
A	2.0	0.95	1270	252	197	4.3%
B	1.2	0.95	390	199	195.5	0.9%
C	8.1	0.45	705	220	208	1.7%
D	3.9	0.45	515	220	214	1.2%
E	5.8	0.45	905	205	196	1.0%
F	0.4	0.95	255	201	197	1.6%
G	4.7	0.45	545	216	176	7.3%
H	2.1	0.95	1070	200	185	1.4%

PERVIOUS VS. IMPERVIOUS:

PERVIOUS: 3,779 SF
IMPERVIOUS: 1,027,967 SF

NO.	DATE	BY	DESCRIPTION	NO.	DATE	BY	DESCRIPTION
6				12			
5				11			
4				10			
3				9			
2				8			
1	10/16/15	MFD	ORIGINAL	7			

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APPROVED BY ENGINEER OF WORK

REGISTRATION R C E 26283

FILE CODE NCW 14.01-09.08

DATE 03/31/16

PREPARATION AND REVISION LOG

ONE PASEO
EXISTING DRAINAGE MAP

EXHIBIT "C" – Existing Condition SSA Analysis Results

Project Description

File Name	SSA Analysis - Existing.SPF

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	Rational
Time of Concentration (TOC) Method	User-Defined
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	NO

Analysis Options

Start Analysis On	Oct 14, 2015	00:00:00
End Analysis On	Oct 15, 2015	00:00:00
Start Reporting On	Oct 14, 2015	00:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	0
Subbasins	8
Nodes	15
Junctions	10
Outfalls	1
Flow Diversions	0
Inlets	4
Storage Nodes	0
Links	13
Channels	0
Pipes	13
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

Return Period	100 year(s)

Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	Sub-A	2.00	0.9500	0.40	0.38	0.76	7.83	0 00:05:54
2	Sub-B	1.20	0.9500	0.39	0.37	0.44	4.83	0 00:05:30
3	Sub-C	8.10	0.4500	0.93	0.42	3.40	7.84	0 00:26:00
4	Sub-D	3.90	0.4500	0.92	0.41	1.61	3.84	0 00:25:12
5	Sub-E	5.80	0.4500	1.07	0.48	2.78	4.72	0 00:35:18
6	Sub-F	0.40	0.9500	0.37	0.35	0.14	1.67	0 00:05:00
7	Sub-G	4.70	0.4500	0.69	0.31	1.46	6.18	0 00:14:06
8	Sub-H	2.10	0.9500	0.48	0.46	0.96	7.33	0 00:07:54

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	Jun-01	Junction	160.55	173.53	0.00	0.00	0.00	23.76	161.51	0.00	12.02	0 00:00	0.00	0.00
2	Jun-02	Junction	190.80	201.00	0.00	0.00	0.00	7.80	191.29	0.00	9.71	0 00:00	0.00	0.00
3	Jun-03	Junction	185.87	194.76	0.00	0.00	0.00	12.21	186.72	0.00	8.04	0 00:00	0.00	0.00
4	Jun-04	Junction	181.62	198.20	0.00	0.00	0.00	11.44	182.49	0.00	15.71	0 00:00	0.00	0.00
5	Jun-05	Junction	181.14	198.00	0.00	0.00	0.00	11.44	182.35	0.00	15.65	0 00:00	0.00	0.00
6	Jun-06	Junction	172.00	179.50	0.00	0.00	0.00	10.40	172.56	0.00	6.94	0 00:00	0.00	0.00
7	Jun-07	Junction	201.30	211.30	0.00	0.00	0.00	7.84	201.75	0.00	9.55	0 00:00	0.00	0.00
8	Jun-10	Junction	208.00	214.00	0.00	0.00	0.00	3.84	208.33	0.00	5.67	0 00:00	0.00	0.00
9	Jun-11	Junction	190.00	196.00	0.00	0.00	0.00	7.21	190.34	0.00	5.66	0 00:00	0.00	0.00
10	Jun-12	Junction	166.20	180.20	166.20	0.00	0.00	13.05	167.61	0.00	12.59	0 00:00	0.00	0.00
11	Out-01	Outfall	154.39					23.76	154.39					

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
1	Link-01	Pipe	Jun-02	Jun-03	180.47	190.80	185.87	2.7300	48.000	0.0130	7.71	237.41	0.03	6.06	0.67	0.17	0.00	Calculated
2	Link-02	Pipe	Jun-03	Jun-04	344.14	185.87	183.12	0.8000	48.000	0.0130	11.44	128.41	0.09	6.14	0.82	0.21	0.00	Calculated
3	Link-03	Pipe	Jun-04	Jun-05	40.00	181.62	181.14	1.2000	66.000	0.0130	11.44	367.86	0.03	4.90	1.03	0.19	0.00	Calculated
4	Link-04	Pipe	Inlet-03	Jun-02	16.31	193.92	193.30	3.8000	18.000	0.0150	7.80	17.75	0.44	7.44	0.86	0.58	0.00	Calculated
5	Link-05	Pipe	Inlet-02	Jun-03	19.67	188.74	188.37	1.8800	18.000	0.0130	4.81	14.41	0.33	6.11	0.68	0.46	0.00	Calculated
6	Link-06	Pipe	Jun-07	Jun-06	303.00	201.30	172.00	9.6700	24.000	0.0130	7.82	70.35	0.11	13.50	0.48	0.24	0.00	Calculated
7	Link-09	Pipe	Jun-06	Inlet-04	123.96	172.00	163.17	7.1200	24.000	0.0130	10.36	60.38	0.17	6.74	1.04	0.52	0.00	Calculated
8	Link-10	Pipe	Inlet-04	Jun-01	20.70	163.17	163.05	0.5800	24.000	0.0130	12.82	17.22	0.74	5.23	1.46	0.73	0.00	Calculated
9	Link-11	Pipe	Jun-01	Out-01	90.00	160.55	158.28	2.5200	66.000	0.0150	23.76	462.21	0.05	9.31	0.90	0.16	0.00	Calculated
10	Link-12	Pipe	Jun-05	Jun-12	958.48	181.14	166.20	1.5600	18.000	0.0150	10.80	11.37	0.95	7.41	1.23	0.82	0.00	Calculated
11	Link-13	Pipe	Jun-12	Jun-01	358.48	166.20	160.55	1.5800	18.000	0.0150	11.11	11.43	0.97	7.59	1.19	0.79	0.00	Calculated
12	Link-14	Pipe	Jun-10	Jun-11	204.24	208.00	190.00	8.8100	24.000	0.0130	3.83	67.16	0.06	11.03	0.34	0.17	0.00	Calculated
13	Link-15	Pipe	Jun-11	Jun-12	96.55	190.00	166.20	24.6500	24.000	0.0130	7.21	112.32	0.06	10.72	0.81	0.41	0.00	Calculated

Inlet Summary

SN	Element ID	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft²)	Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Allowable Spread (ft)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)
1	Inlet-01	FHWA HEC-22 GENERIC	N/A	On Sag	1	191.20	197.70	0.00	10.00	1.67	N/A	N/A	N/A	7.00	9.52	198.14
2	Inlet-02	FHWA HEC-22 GENERIC	N/A	On Sag	1	188.74	193.92	0.00	10.00	4.83	N/A	N/A	N/A	7.00	12.48	194.54
3	Inlet-03	FHWA HEC-22 GENERIC	N/A	On Sag	1	193.92	200.00	0.00	10.00	7.82	N/A	N/A	N/A	7.00	15.28	200.68
4	Inlet-04	FHWA HEC-22 GENERIC	N/A	On Sag	1	163.17	174.85	0.00	10.00	7.32	N/A	N/A	N/A	7.00	29.28	175.68

Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft²)	Minimum Pipe Cover (in)
1	Jun-01	160.55	173.53	12.98	0.00	-160.55	0.00	-173.53	0.00	0.00
2	Jun-02	190.80	201.00	10.20	0.00	-190.80	0.00	-201.00	0.00	0.00
3	Jun-03	185.87	194.76	8.89	0.00	-185.87	0.00	-194.76	0.00	0.00
4	Jun-04	181.62	198.20	16.58	0.00	-181.62	0.00	-198.20	0.00	0.00
5	Jun-05	181.14	198.00	16.86	0.00	-181.14	0.00	-198.00	0.00	0.00
6	Jun-06	172.00	179.50	7.50	0.00	-172.00	0.00	-179.50	0.00	0.00
7	Jun-07	201.30	211.30	10.00	0.00	-201.30	0.00	-211.30	0.00	0.00
8	Jun-10	208.00	214.00	6.00	0.00	-208.00	0.00	-214.00	0.00	0.00
9	Jun-11	190.00	196.00	6.00	0.00	-190.00	0.00	-196.00	0.00	0.00
10	Jun-12	166.20	180.20	14.00	166.20	0.00	0.00	-180.20	0.00	0.00

Junction Results

SN	Element ID	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Max HGL Elevation Attained (ft)	Max HGL Depth Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Average HGL Elevation Attained (ft)	Average HGL Depth Attained (ft)	Time of Max HGL Occurrence (days hh:mm)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	Jun-01	23.76	0.00	161.51	0.96	0.00	12.02	160.68	0.13	0 00:09	0 00:00	0.00	0.00
2	Jun-02	7.80	0.00	191.29	0.49	0.00	9.71	190.82	0.02	0 00:06	0 00:00	0.00	0.00
3	Jun-03	12.21	0.00	186.72	0.85	0.00	8.04	185.91	0.04	0 00:06	0 00:00	0.00	0.00
4	Jun-04	11.44	0.00	182.49	0.87	0.00	15.71	181.66	0.04	0 00:06	0 00:00	0.00	0.00
5	Jun-05	11.44	0.00	182.35	1.21	0.00	15.65	181.20	0.06	0 00:07	0 00:00	0.00	0.00
6	Jun-06	10.40	6.17	172.56	0.56	0.00	6.94	172.08	0.08	0 00:14	0 00:00	0.00	0.00
7	Jun-07	7.84	7.84	201.75	0.45	0.00	9.55	201.36	0.06	0 00:26	0 00:00	0.00	0.00
8	Jun-10	3.84	3.84	208.33	0.33	0.00	5.67	208.04	0.04	0 00:25	0 00:00	0.00	0.00
9	Jun-11	7.21	4.72	190.34	0.34	0.00	5.66	190.05	0.05	0 00:25	0 00:00	0.00	0.00
10	Jun-12	13.05	0.00	167.61	1.41	0.00	12.59	166.36	0.16	0 00:09	0 00:00	0.00	0.00

Pipe Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Pipe Width (in)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate	No. of Barrels
1	Link-01	180.47	190.80	0.00	185.87	0.00	4.93	2.7300	CIRCULAR	48.000	48.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
2	Link-02	344.14	185.87	0.00	183.12	1.50	2.75	0.8000	CIRCULAR	48.000	48.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
3	Link-03	40.00	181.62	0.00	181.14	0.00	0.48	1.2000	CIRCULAR	66.000	66.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
4	Link-04	16.31	193.92	0.00	193.30	2.50	0.62	3.8000	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
5	Link-05	19.67	188.74	0.00	188.37	2.50	0.37	1.8800	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
6	Link-06	303.00	201.30	0.00	172.00	0.00	29.30	9.6700	CIRCULAR	24.000	24.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
7	Link-09	123.96	172.00	0.00	163.17	0.00	8.83	7.1200	CIRCULAR	24.000	24.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
8	Link-10	20.70	163.17	0.00	163.05	2.50	0.12	0.5800	CIRCULAR	24.000	24.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
9	Link-11	90.00	160.55	0.00	158.28	3.89	2.27	2.5200	CIRCULAR	66.000	66.000	0.0150	0.2000	0.5000	0.0000	0.00	No	1
10	Link-12	958.48	181.14	0.00	166.20	0.00	14.94	1.5600	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
11	Link-13	358.48	166.20	0.00	160.55	0.00	5.65	1.5800	CIRCULAR	18.000	18.000	0.0150	0.5000	0.5000	0.0000	0.00	No	1
12	Link-14	204.24	208.00	0.00	190.00	0.00	18.00	8.8100	CIRCULAR	24.000	24.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
13	Link-15	96.55	190.00	0.00	166.20	0.00	23.80	24.6500	CIRCULAR	24.000	24.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1

Pipe Results

SN	Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Froude Number	Reported Condition
1	Link-01	7.71	0 00:06	237.41	0.03	6.06	0.50	0.67	0.17	0.00		Calculated
2	Link-02	11.44	0 00:06	128.41	0.09	6.14	0.93	0.82	0.21	0.00		Calculated
3	Link-03	11.44	0 00:06	367.86	0.03	4.90	0.14	1.03	0.19	0.00		Calculated
4	Link-04	7.80	0 00:06	17.75	0.44	7.44	0.04	0.86	0.58	0.00		Calculated
5	Link-05	4.81	0 00:05	14.41	0.33	6.11	0.05	0.68	0.46	0.00		Calculated
6	Link-06	7.82	0 00:26	70.35	0.11	13.50	0.37	0.48	0.24	0.00		Calculated
7	Link-09	10.36	0 00:14	60.38	0.17	6.74	0.31	1.04	0.52	0.00		Calculated
8	Link-10	12.82	0 00:08	17.22	0.74	5.23	0.07	1.46	0.73	0.00		Calculated
9	Link-11	23.76	0 00:09	462.21	0.05	9.31	0.16	0.90	0.16	0.00		Calculated
10	Link-12	10.80	0 00:08	11.37	0.95	7.41	2.16	1.23	0.82	0.00		Calculated
11	Link-13	11.11	0 00:09	11.43	0.97	7.59	0.79	1.19	0.79	0.00		Calculated
12	Link-14	3.83	0 00:25	67.16	0.06	11.03	0.31	0.34	0.17	0.00		Calculated
13	Link-15	7.21	0 00:25	112.32	0.06	10.72	0.15	0.81	0.41	0.00		Calculated

Inlet Input

SN	Element ID	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Inlet Depth (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Ponded Area (ft²)	Grate Clogging Factor (%)
1	Inlet-01	FHWA HEC-22 GENERIC	N/A	On Sag	1	191.20	197.70	6.50	0.00	0.00	10.00	0.00
2	Inlet-02	FHWA HEC-22 GENERIC	N/A	On Sag	1	188.74	193.92	5.18	0.00	0.00	10.00	0.00
3	Inlet-03	FHWA HEC-22 GENERIC	N/A	On Sag	1	193.92	200.00	6.08	0.00	0.00	10.00	0.00
4	Inlet-04	FHWA HEC-22 GENERIC	N/A	On Sag	1	163.17	174.85	11.68	0.00	0.00	10.00	0.00

Inlet Results

SN	Element ID	Peak Flow (cfs)	Peak Lateral Inflow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Max Depth Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	Inlet-01	1.67	1.67	N/A	N/A	N/A	9.52	198.14	0.44	0 00:00	0.00	0.00
2	Inlet-02	4.83	4.83	N/A	N/A	N/A	12.48	194.54	0.62	0 00:05	0.00	0.00
3	Inlet-03	7.82	7.82	N/A	N/A	N/A	15.28	200.68	0.68	0 00:06	0.00	0.00
4	Inlet-04	7.32	7.32	N/A	N/A	N/A	29.28	175.68	0.83	0 00:08	0.00	0.00

EXHIBIT “D” – Proposed Condition Drainage Basin Map

LEGAL DESCRIPTION

PARCELS 1 AND 2 OF PARCEL MAP 15061 RECORDED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY ON DECEMBER 16, 1987 AND PARCEL 2 OF PARCEL MAP 19130, RECORDED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY ON DECEMBER 20, 2002, ALL LOCATED IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA.

ASSESSOR'S PARCEL NUMBER:

304-070-49-00, 304-070-43-00, 304-070-52-00 & 304-070-57-00

LEGEND

PROPERTY BOUNDARY	
STORM DRAIN	
BASIN AREA	XX
NODE NO.	1
BASIN LIMITS	
CURB INLET	
CLEANOUT	
GRATE INLET	
OVERLAND FLOW	1%

60 0 60 120
SCALE 1" = 60'

PERVIOUS VS. IMPERVIOUS:

PERVIOUS: 229,607 SF
IMPERVIOUS: 802,139 SF

One Paseo Proposed Condition Hydrology Summary

Basin	SF	Acres	C	Tc (min)	Intensity (in/hr)	Q_{100} (cfs)
1	58984	1.4	0.95	5.0	4.40	5.66
2	5316	0.1	0.85	5.0	4.40	0.46
3	7569	0.2	0.85	5.0	4.40	0.65
4	7835	0.2	0.85	5.0	4.40	0.67
5	6614	0.2	0.85	5.0	4.40	0.57
6	26651	0.6	0.85	5.0	4.40	2.29
7	15499	0.4	0.85	5.0	4.40	1.33
8	5228	0.1	0.85	5.0	4.40	0.45
9	27274	0.6	0.85	5.0	4.40	2.34
10	30725	0.7	0.85	5.0	4.40	2.64
11	40779	0.8	0.85	5.0	4.40	2.99
12	40611	0.9	0.85	5.0	4.40	3.49
13	78901	1.8	0.85	5.0	4.40	6.77
14	12153	0.3	0.85	5.0	4.40	1.04
15	23298	0.5	0.85	5.0	4.40	2.00
16	22781	0.5	0.85	5.0	4.40	1.96
17	17356	0.4	0.85	5.0	4.40	1.49
18	16757	0.4	0.85	5.0	4.40	1.44
19	12181	0.3	0.85	5.0	4.40	1.05
20	14607	0.3	0.85	5.0	4.40	1.25
21	41779	1.0	0.85	5.0	4.40	3.59
22	77291	1.8	0.85	5.0	4.40	6.64
23	25784	0.6	0.85	5.0	4.40	2.21
24	21504	0.5	0.85	5.0	4.40	1.85
25	23796	0.5	0.95	5.0	4.40	2.28
26	15506	0.4	0.85	5.0	4.40	1.33
27	9105	0.2	0.85	5.0	4.40	0.78
28	5060	0.1	0.85	5.0	4.40	0.43
29	13883	0.3	0.85	5.0	4.40	1.19
30	2911	0.1	0.85	5.0	4.40	0.25
31	8649	0.2	0.85	5.0	4.40	0.74
32	62085	1.4	0.85	5.0	4.40	5.33
33	25164	0.6	0.85	5.0	4.40	2.16
34	8695	0.2	0.85	5.0	4.40	0.75
35	26404	0.6	0.85	5.0	4.40	2.27
36	42446	1.0	0.85	5.0	4.40	3.64
37	49256	1.1	0.85	5.0	4.40	4.23
38	45714	1.0	0.95	5.0	4.40	4.39
39	14633	0.3	0.85	5.0	4.40	1.26
40	10611	0.2	0.85	5.0	4.40	0.91
41	9330	0.2	0.85	5.0	4.40	0.80
42	35594	0.8	0.85	5.0	4.40	3.06
43	6215	0.1	0.85	5.0	4.40	0.53
44	12850	0.3	0.85	5.0	4.40	1.10
45	7311	0.2	0.85	5.0	4.40	0.63
46	23262	0.5	0.85	5.0	4.40	2.00
47	24284	0.6	0.85	5.0	4.40	2.08
48	8679	0.2	0.85	5.0	4.40	0.75
49	16918	0.4	0.95	5.0	4.40	1.62
50	27001	0.6	0.95	5.0	4.40	2.59
51	60348	1.4	0.95	5.0	4.40	5.79

NO.	DATE	BY	DESCRIPTION	NO.	DATE	BY	DESCRIPTION
1	10/16/15	MFD	ORIGINAL	7			
2				8			
3				9			
4				10			
5				11			
6				12			

Leppert Engineering CORPORATION
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APPROVED BY ENGINEER OF WORK
REGISTRATION R.C.E. 26283
FILE CODE NCW 14.01-09.08
DATE 03/31/16

PREPARATION AND REVISION LOG

ONE PASEO
PROPOSED DRAINAGE MAP

EXHIBIT “E” – Proposed Condition SSA Analysis

Project Description

File Name	SSA Analysis - Proposed.SPF

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	Rational
Time of Concentration (TOC) Method	User-Defined
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	NO

Analysis Options

Start Analysis On	Oct 14, 2015	00:00:00
End Analysis On	Oct 15, 2015	00:00:00
Start Reporting On	Oct 14, 2015	00:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	0
Subbasins	51
Nodes	100
Junctions	70
Outfalls	1
Flow Diversions	0
Inlets	29
Storage Nodes	0
Links	99
Channels	0
Pipes	99
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

Return Period	100 year(s)

Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	Sub-01	1.40	0.9500	0.37	0.35	0.49	5.85	0 00:05:00
2	Sub-02	0.10	0.8500	0.37	0.31	0.03	0.37	0 00:05:00
3	Sub-03	0.20	0.8500	0.37	0.31	0.06	0.75	0 00:05:00
4	Sub-04	0.20	0.8500	0.37	0.31	0.06	0.75	0 00:05:00
5	Sub-05	0.20	0.8500	0.37	0.31	0.06	0.75	0 00:05:00
6	Sub-06	0.60	0.8500	0.37	0.31	0.19	2.24	0 00:05:00
7	Sub-07	0.40	0.8500	0.37	0.31	0.12	1.50	0 00:05:00
8	Sub-08	0.10	0.8500	0.37	0.31	0.03	0.37	0 00:05:00
9	Sub-09	0.70	0.8500	0.37	0.31	0.22	2.62	0 00:05:00
10	Sub-10	0.70	0.8500	0.37	0.31	0.22	2.62	0 00:05:00
11	Sub-11	0.70	0.8500	0.37	0.31	0.22	2.62	0 00:05:00
12	Sub-12	0.90	0.8500	0.37	0.31	0.28	3.37	0 00:05:00
13	Sub-13	1.90	0.8500	0.37	0.31	0.59	7.11	0 00:05:00
14	Sub-14	0.30	0.8500	0.37	0.31	0.09	1.12	0 00:05:00
15	Sub-15	0.50	0.8500	0.37	0.31	0.16	1.87	0 00:05:00
16	Sub-16	0.50	0.8500	0.37	0.31	0.16	1.87	0 00:05:00
17	Sub-17	0.40	0.8500	0.37	0.31	0.12	1.50	0 00:05:00
18	Sub-18	0.40	0.8500	0.37	0.31	0.12	1.50	0 00:05:00
19	Sub-19	0.30	0.8500	0.37	0.31	0.09	1.12	0 00:05:00
20	Sub-20	0.30	0.8500	0.37	0.31	0.09	1.12	0 00:05:00
21	Sub-21	1.00	0.8500	0.37	0.31	0.31	3.74	0 00:05:00
22	Sub-22	1.80	0.8500	0.37	0.31	0.56	6.73	0 00:05:00
23	Sub-23	0.60	0.8500	0.37	0.31	0.19	2.24	0 00:05:00
24	Sub-24	0.50	0.8500	0.37	0.31	0.16	1.87	0 00:05:00
25	Sub-25	0.50	0.9500	0.37	0.35	0.17	2.09	0 00:05:00
26	Sub-26	0.40	0.8500	0.37	0.31	0.12	1.50	0 00:05:00
27	Sub-27	0.20	0.8500	0.37	0.31	0.06	0.75	0 00:05:00
28	Sub-28	0.10	0.8500	0.37	0.31	0.03	0.37	0 00:05:00
29	Sub-29	0.30	0.8500	0.37	0.31	0.09	1.12	0 00:05:00
30	Sub-30	0.10	0.8500	0.37	0.31	0.03	0.37	0 00:05:00
31	Sub-31	0.20	0.8500	0.37	0.31	0.06	0.75	0 00:05:00
32	Sub-32	1.40	0.8500	0.37	0.31	0.44	5.24	0 00:05:00
33	Sub-33	0.60	0.8500	0.37	0.31	0.19	2.24	0 00:05:00
34	Sub-34	0.20	0.8500	0.37	0.31	0.06	0.75	0 00:05:00
35	Sub-35	0.60	0.8500	0.37	0.31	0.19	2.24	0 00:05:00
36	Sub-36	1.00	0.8500	0.37	0.31	0.31	3.74	0 00:05:00
37	Sub-37	1.10	0.8500	0.37	0.31	0.34	4.11	0 00:05:00
38	Sub-38	1.00	0.9500	0.37	0.35	0.35	4.18	0 00:05:00
39	Sub-39	0.30	0.8500	0.37	0.31	0.09	1.12	0 00:05:00
40	Sub-40	0.20	0.8500	0.37	0.31	0.06	0.75	0 00:05:00
41	Sub-41	0.20	0.8500	0.37	0.31	0.06	0.75	0 00:05:00
42	Sub-42	0.80	0.8500	0.37	0.31	0.25	2.99	0 00:05:00
43	Sub-43	0.10	0.8500	0.37	0.31	0.03	0.37	0 00:05:00
44	Sub-44	0.30	0.8500	0.37	0.31	0.09	1.12	0 00:05:00
45	Sub-45	0.20	0.8500	0.37	0.31	0.06	0.75	0 00:05:00
46	Sub-46	0.50	0.8500	0.37	0.31	0.16	1.87	0 00:05:00
47	Sub-47	0.60	0.8500	0.37	0.31	0.19	2.24	0 00:05:00
48	Sub-48	0.20	0.8500	0.37	0.31	0.06	0.75	0 00:05:00
49	Sub-49	0.40	0.9500	0.37	0.35	0.14	1.67	0 00:05:00
50	Sub-50	0.60	0.9500	0.37	0.35	0.21	2.51	0 00:05:00
51	Sub-51	1.40	0.9500	0.37	0.35	0.49	5.85	0 00:05:00

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft^2)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	Jun-01	Junction	194.20	203.00	0.00	6.00	0.00	6.31	194.87	0.00	8.13	0 00:00	0.00	0.00
2	Jun-02	Junction	194.50	203.00	0.00	6.00	0.00	5.23	195.34	0.00	7.66	0 00:00	0.00	0.00
3	Jun-03	Junction	187.37	198.13	0.00	6.00	0.00	7.58	188.82	0.00	9.31	0 00:00	0.00	0.00
4	Jun-04	Junction	192.57	200.56	0.00	0.00	0.00	0.00	192.57	0.00	7.99	0 00:00	0.00	0.00
5	Jun-05	Junction	191.25	200.18	0.00	0.00	0.00	5.22	191.78	0.00	8.40	0 00:00	0.00	0.00
6	Jun-06	Junction	185.06	198.25	0.00	0.00	0.00	11.02	186.13	0.00	12.12	0 00:00	0.00	0.00
7	Jun-07	Junction	183.71	197.90	0.00	0.00	0.00	11.80	184.40	0.00	13.50	0 00:00	0.00	0.00
8	Jun-08	Junction	179.21	197.90	0.00	0.00	0.00	11.81	180.30	0.00	17.60	0 00:00	0.00	0.00
9	Jun-09	Junction	191.55	200.18	0.00	0.00	0.00	2.99	192.15	0.00	8.03	0 00:00	0.00	0.00
10	Jun-10	Junction	191.55	200.18	0.00	0.00	0.00	2.24	192.07	0.00	8.11	0 00:00	0.00	0.00
11	Jun-11	Junction	174.97	197.90	0.00	0.00	0.00	18.47	175.94	0.00	21.96	0 00:00	0.00	0.00
12	Jun-12	Junction	170.03	185.04	0.00	0.00	0.00	34.21	170.95	0.00	14.09	0 00:00	0.00	0.00
13	Jun-13	Junction	174.53	189.00	0.00	0.00	0.00	16.67	175.86	0.00	13.14	0 00:00	0.00	0.00
14	Jun-14	Junction	175.69	189.00	0.00	0.00	0.00	16.68	177.01	0.00	11.99	0 00:00	0.00	0.00
15	Jun-15	Junction	192.73	200.35	0.00	0.00	0.00	7.51	193.65	0.00	6.70	0 00:00	0.00	0.00
16	Jun-16	Junction	191.73	199.48	0.00	0.00	0.00	7.44	192.40	0.00	7.08	0 00:00	0.00	0.00
17	Jun-17	Junction	188.72	197.68	0.00	0.00	0.00	9.02	189.49	0.00	8.19	0 00:00	0.00	0.00
18	Jun-18	Junction	193.03	200.35	0.00	0.00	0.00	2.24	193.64	0.00	6.71	0 00:00	0.00	0.00
19	Jun-19	Junction	193.03	200.35	0.00	0.00	0.00	0.16	193.65	0.00	6.70	0 00:00	0.00	0.00
20	Jun-20	Junction	189.32	197.68	0.00	0.00	0.00	1.87	189.70	0.00	7.98	0 00:00	0.00	0.00
21	Jun-21	Junction	198.99	205.97	0.00	0.00	0.00	0.75	199.26	0.00	6.71	0 00:00	0.00	0.00
22	Jun-22	Junction	198.04	205.23	0.00	0.00	0.00	5.57	198.74	0.00	6.49	0 00:00	0.00	0.00
23	Jun-23	Junction	198.34	205.23	0.00	0.00	0.00	3.74	199.06	0.00	6.17	0 00:00	0.00	0.00
24	Jun-24	Junction	196.41	203.85	0.00	0.00	0.00	5.56	197.19	0.00	6.66	0 00:00	0.00	0.00
25	Jun-25	Junction	195.71	203.26	0.00	0.00	0.00	5.53	196.35	0.00	6.91	0 00:00	0.00	0.00
26	Jun-26	Junction	185.71	193.85	0.00	0.00	0.00	9.02	186.51	0.00	7.34	0 00:00	0.00	0.00
27	Jun-27	Junction	182.77	192.20	0.00	0.00	0.00	12.89	184.04	0.00	8.16	0 00:00	0.00	0.00
28	Jun-28	Junction	164.75	176.43	0.00	0.00	0.00	40.89	165.80	0.00	10.63	0 00:00	0.00	0.00
29	Jun-29	Junction	159.33	173.53	0.00	0.00	0.00	71.33	161.30	0.00	12.23	0 00:00	0.00	0.00
30	Jun-30	Junction	175.26	182.76	0.00	0.00	0.00	37.85	176.36	0.00	6.40	0 00:00	0.00	0.00
31	Jun-31	Junction	175.56	182.76	0.00	0.00	0.00	6.73	176.67	0.00	6.09	0 00:00	0.00	0.00
32	Jun-32	Junction	165.77	175.42	0.00	0.00	0.00	40.78	168.03	0.00	7.39	0 00:00	0.00	0.00
33	Jun-33	Junction	195.24	207.67	0.00	0.00	0.00	11.77	204.26	0.00	3.41	0 00:00	0.00	0.00
34	Jun-34	Junction	195.54	207.67	0.00	0.00	0.00	3.75	204.31	0.00	3.36	0 00:00	0.00	0.00
35	Jun-35	Junction	180.60	196.30	0.00	0.00	0.00	16.59	181.95	0.00	14.35	0 00:00	0.00	0.00
36	Jun-36	Junction	180.02	198.20	0.00	0.00	0.00	16.59	180.92	0.00	17.28	0 00:00	0.00	0.00
37	Jun-37	Junction	160.55	173.53	0.00	0.00	0.00	38.46	161.99	0.00	11.54	0 00:00	0.00	0.00
38	Jun-38	Junction	174.05	197.00	0.00	0.00	0.00	19.55	174.98	0.00	22.02	0 00:00	0.00	0.00
39	Jun-39	Junction	181.14	198.00	0.00	0.00	0.00	7.04	181.66	0.00	16.34	0 00:00	0.00	0.00
40	Jun-40	Junction	181.62	198.20	0.00	0.00	0.00	5.63	182.17	0.00	16.03	0 00:00	0.00	0.00
41	Jun-41	Junction	185.87	194.76	0.00	0.00	0.00	6.21	186.46	0.00	8.30	0 00:00	0.00	0.00
42	Jun-43	Junction	165.08	176.43	0.00	0.00	0.00	40.73	167.31	0.00	9.12	0 00:00	0.00	0.00
43	Jun-44	Junction	189.66	204.10	0.00	0.00	0.00	31.22	190.61	0.00	13.49	0 00:00	0.00	0.00
44	Jun-45	Junction	190.46	205.78	0.00	0.00	0.00	24.26	192.14	0.00	13.64	0 00:00	0.00	0.00
45	Jun-46	Junction	206.75	213.25	0.00	0.00	0.00	8.60	207.29	0.00	5.96	0 00:00	0.00	0.00
46	Jun-47	Junction	209.56	216.55	0.00	0.00	0.00	5.41	210.21	0.00	6.34	0 00:00	0.00	0.00
47	Jun-48	Junction	210.50	217.00	0.00	0.00	0.00	1.46	210.79	0.00	6.21	0 00:00	0.00	0.00
48	Jun-49	Junction	217.43	229.00	0.00	0.00	0.00	1.46	217.69	0.00	11.31	0 00:00	0.00	0.00
49	Jun-50	Junction	209.86	216.55	0.00	0.00	0.00	1.50	210.27	0.00	6.28	0 00:00	0.00	0.00
50	Jun-51	Junction	209.56	216.55	0.00	0.00	0.00	2.62	210.39	0.00	6.16	0 00:00	0.00	0.00
51	Jun-52	Junction	207.05	213.25	0.00	0.00	0.00	3.37	207.69	0.00	5.56	0 00:00	0.00	0.00
52	Jun-53	Junction	191.73	205.89	0.00	0.00	0.00	15.77	196.67	0.00	9.22	0 00:00	0.00	0.00
53	Jun-54	Junction	193.33	206.87	0.00	0.00	0.00	14.29	199.46	0.00	7.41	0 00:00	0.00	0.00
54	Jun-55	Junction	193.62	206.87	0.00	0.00	0.00	14.28	200.83	0.00	6.04	0 00:00	0.00	0.00
55	Jun-56	Junction	194.04	207.04	0.00	0.00	0.00	14.27	202.47	0.00	4.57	0 00:00	0.00	0.00
56	Jun-57	Junction	194.34	207.04	0.00	0.00	0.00	2.62	202.56	0.00	4.48	0 00:00	0.00	0.00
57	Jun-58	Junction	197.43	206.31	0.00	0.00	0.00	11.91	205.86	0.00	0.45	0 00:00	0.00	0.00
58	Jun-59	Junction	198.03	206.06	0.00	0.00	0.00	11.22	206.06	0.00	0.00	0 00:04	0.00	0.00
59	Jun-60	Junction	198.63	206.06	0.00	0.00	0.00	2.84	206.06	0.00	0.00	0 00:04	0.00	0.00
60	Jun-61	Junction	200.21	205.80	0.00	0.00	0.00	7.13	205.80	0.00	0.00	0 00:04	0.01	1.00
61	Jun-62	Junction	198.98	206.30	0.00	0.00	0.00	10.28	206.11	0.00	0.19	0 00:00	0.00	0.00
62	Jun-63	Junction	199.97	206.47	0.00	0.00	0.00	13.09	206.47	0.00	0.00	0 00:05	0.24	3.00
63	Jun-64	Junction	202.50	209.00	0.00	0.00	0.00	12.86	209.00	0.00	0.00	0 00:04	0.00	0.00
64	Jun-65	Junction	202.49	207.89	0.00	0.00	0.00	4.28	207.89	0.00	0.00	0 00:04	0.01	2.00
65	Jun-66	Junction	220.93	228.50	0.00	0.00	0.00	2.62	221.57	0.00	6.93	0 00:00	0.00	0.00
66	Jun-67	Junction	220.18	228.50	0.00	0.00	0.00	1.87	220.65	0.00	7.85	0 00:00	0.00	0.00
67	Jun-68	Junction	219.88	228.50	0.00	0.00	0.00	7.54	220.43	0.00	8.07	0 00:00	0.00	0.00
68	Jun-69	Junction	223.38	229.00	0.00	0.00	0.00	2.57	223.91	0.00	5.09	0 00:00	0.00	0.00
69	Jun-70	Junction	223.68	229.00	0.00	0.00	0.00	2.24	224.20	0.00	4.80	0 00:00	0.00	0.00
70	Jun-71	Junction	223.88	229.00	0.00	0.00	0.00	0.37	224.07	0.00	4.93	0 00:00	0.00	0.00
71	Out-01	Outfall	154.39					71.31	154.39					

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
1	Link-01	Pipe	Jun-07	Jun-08	101.46	183.71	179.21	4.4400	24.000	0.0130	11.81	47.64	0.25	8.76	0.89	0.45	0.00	Calculated
2	Link-02	Pipe	Inlet-07	Jun-07	25.28	184.51	183.71	3.1600	24.000	0.0130	11.80	40.24	0.29	9.07	0.86	0.43	0.00	Calculated
3	Link-03	Pipe	Jun-06	Inlet-07	15.35	185.06	184.51	3.5800	24.000	0.0130	11.03	42.82	0.26	6.58	1.05	0.53	0.00	Calculated
4	Link-04	Pipe	Jun-09	Jun-05	15.00	191.55	191.25	2.0000	18.000	0.0130	2.98	14.86	0.20	4.92	0.56	0.38	0.00	Calculated
5	Link-05	Pipe	Jun-10	Jun-05	15.00	191.55	191.25	2.0000	18.000	0.0130	2.24	14.86	0.15	4.09	0.52	0.35	0.00	Calculated
6	Link-06	Pipe	Jun-02	Jun-01	15.00	194.50	194.20	2.0000	18.000	0.0130	5.23	14.86	0.35	5.93	0.75	0.50	0.00	Calculated
7	Link-07	Pipe	Jun-08	Jun-11	37.00	179.21	178.47	2.0000	24.000	0.0130	11.81	31.99	0.37	7.87	0.97	0.48	0.00	Calculated
8	Link-08	Pipe	Jun-13	Jun-12	50.00	174.53	173.53	2.0000	24.000	0.0130	16.68	31.99	0.52	8.70	1.18	0.59	0.00	Calculated
9	Link-09	Pipe	Jun-14	Jun-13	58.00	175.69	174.53	2.0000	24.000	0.0130	16.67	31.99	0.52	7.57	1.32	0.66	0.00	Calculated
10	Link-10	Pipe	Jun-18	Jun-15	15.00	193.03	192.73	2.0000	18.000	0.0130	2.21	14.86	0.15	4.04	0.77	0.51	0.00	Calculated
11	Link-11	Pipe	Jun-19	Jun-15	15.00	193.03	192.73	2.0000	18.000	0.0130	0.16	14.86	0.01	0.72	0.77	0.51	0.00	Calculated
12	Link-12	Pipe	Jun-15	Jun-16	49.90	192.73	191.73	2.0000	18.000	0.0130	7.44	14.87	0.50	7.83	0.79	0.53	0.00	Calculated
13	Link-13	Pipe	Jun-20	Jun-17	30.00	189.32	188.72	2.0000	18.000	0.0130	1.87	14.86	0.13	3.95	0.56	0.37	0.00	Calculated
14	Link-14	Pipe	Jun-21	Inlet-08	15.00	198.99	198.69	2.0000	18.000	0.0130	0.74	14.86	0.05	2.61	0.33	0.22	0.00	Calculated
15	Link-15	Pipe	Jun-23	Jun-22	15.00	198.34	198.04	2.0000	18.000	0.0130	3.73	14.86	0.25	4.56	0.70	0.47	0.00	Calculated
16	Link-16	Pipe	Jun-27	Inlet-09	10.00	182.77	182.42	3.5000	24.000	0.0130	12.90	42.32	0.30	6.79	1.18	0.59	0.00	Calculated
17	Link-17	Pipe	Inlet-10	Inlet-11	50.00	189.55	188.55	2.0000	12.000	0.0130	0.73	5.04	0.15	4.37	0.27	0.27	0.00	Calculated
18	Link-18	Pipe	Inlet-11	Jun-27	26.40	188.05	182.77	20.0000	18.000	0.0130	4.44	46.98	0.09	7.61	0.78	0.52	0.00	Calculated
19	Link-19	Pipe	Jun-28	Jun-29	63.60	164.75	159.33	8.5200	36.000	0.0130	41.16	194.71	0.21	11.69	1.50	0.50	0.00	Calculated
20	Link-20	Pipe	Jun-31	Jun-30	15.00	175.56	175.26	2.0000	18.000	0.0130	6.67	14.86	0.45	5.53	1.10	0.73	0.00	Calculated
21	Link-21	Pipe	Jun-34	Jun-33	15.00	195.54	195.24	2.0000	18.000	0.0130	2.23	14.86	0.15	4.23	1.50	1.00	7.00	SURCHARGED
22	Link-22	Pipe	Inlet-01	Jun-01	115.00	196.50	194.20	2.0000	18.000	0.0130	1.09	14.86	0.07	2.32	0.47	0.31	0.00	Calculated
23	Link-23	Pipe	Jun-01	Inlet-02	278.00	194.20	188.64	2.0000	18.000	0.0130	6.05	14.86	0.41	5.17	1.04	0.69	0.00	Calculated
24	Link-24	Pipe	Inlet-03	Inlet-02	35.00	196.50	188.64	22.4600	18.000	0.0130	1.49	49.78	0.03	7.51	0.80	0.53	0.00	Calculated
25	Link-25	Pipe	Inlet-02	Jun-03	254.09	188.64	187.37	0.5000	18.000	0.0130	7.58	7.43	1.02	4.51	1.42	0.95	0.00	> CAPACITY
26	Link-26	Pipe	Jun-03	Inlet-04	116.91	187.37	186.78	0.5000	18.000	0.0130	7.23	7.46	0.97	4.32	1.43	0.95	0.00	Calculated
27	Link-27	Pipe	Inlet-05	Jun-06	38.00	185.75	185.56	0.5000	18.000	0.0130	7.58	7.43	1.02	4.83	1.25	0.83	0.00	> CAPACITY
28	Link-28	Pipe	Jun-05	Jun-06	140.00	191.25	185.56	4.0600	18.000	0.0130	5.11	21.18	0.24	9.49	0.52	0.34	0.00	Calculated
29	Link-29	Pipe	Inlet-04	Inlet-05	207.18	186.78	185.75	0.5000	18.000	0.0130	7.16	7.41	0.97	4.19	1.42	0.95	0.00	Calculated
30	Link-30	Pipe	Jun-04	Jun-05	32.50	192.57	191.25	4.0600	18.000	0.0130	0.00	21.17	0.00	0.00	0.27	0.18	0.00	Calculated
31	Link-31	Pipe	Inlet-06	Jun-04	57.10	195.94	192.57	5.9000	18.000	0.0130	0.00	25.52	0.00	0.00	0.00	0.00	0.00	Calculated
32	Link-32	Pipe	Inlet-09	Jun-35	52.00	182.42	180.60	3.5000	24.000	0.0130	16.59	42.32	0.39	8.27	1.22	0.61	0.00	Calculated
33	Link-33	Pipe	Jun-35	Jun-36	16.50	180.60	180.02	3.5200	24.000	0.0130	16.59	42.41	0.39	9.17	1.12	0.56	0.00	Calculated
34	Link-34	Pipe	Jun-36	Jun-14	110.00	180.02	175.69	3.9400	24.000	0.0130	16.68	44.88	0.37	9.40	1.10	0.55	0.00	Calculated
35	Link-35	Pipe	Jun-29	Out-01	30.00	159.33	158.28	3.5000	66.000	0.0130	71.31	628.24	0.11	12.28	1.61	0.29	0.00	Calculated
36	Link-36	Pipe	Inlet-12	Jun-37	20.70	163.17	163.05	0.5800	24.000	0.0130	7.67	17.22	0.45	4.65	1.04	0.52	0.00	Calculated
37	Link-37	Pipe	Jun-37	Jun-29	60.00	160.55	159.33	2.0300	66.000	0.0130	37.97	478.85	0.08	6.38	1.69	0.31	0.00	Calculated
38	Link-38	Pipe	Jun-12	Jun-37	343.63	170.03	160.55	2.7600	66.000	0.0130	33.82	557.76	0.06	9.10	1.18	0.21	0.00	Calculated
39	Link-39	Pipe	Jun-11	Jun-38	76.60	174.97	174.05	1.2000	66.000	0.0130	18.09	368.02	0.05	6.62	0.95	0.17	0.00	Calculated
40	Link-40	Pipe	Jun-38	Jun-12	380.31	174.05	170.03	1.0600	66.000	0.0130	19.53	345.25	0.06	7.53	0.92	0.17	0.00	Calculated
41	Link-41	Pipe	Inlet-13	Jun-38	24.22	177.82	176.98	3.4700	24.000	0.0130	2.50	42.13	0.06	6.47	0.36	0.18	0.00	Calculated
42	Link-42	Pipe	Inlet-14	Jun-39	17.00	191.20	183.14	47.4100	18.000	0.0130	1.67	72.33	0.02	50.00	0.17	0.11	0.00	Calculated
43	Link-43	Pipe	Jun-39	Jun-11	518.07	181.14	174.97	1.1900	66.000	0.0130	6.73	366.47	0.02	3.84	0.74	0.13	0.00	Calculated
44	Link-44	Pipe	Jun-40	Jun-39	40.00	181.62	181.14	1.2000	66.000	0.0130	5.64	367.86	0.02	4.82	0.53	0.10	0.00	Calculated
45	Link-45	Pipe	Inlet-08	Jun-22	32.00	198.69	198.04	2.0300	18.000	0.0130	1.86	14.97	0.12	3.22	0.54	0.36	0.00	Calculated
46	Link-46	Pipe	Jun-22	Jun-24	81.91	198.04	196.41	1.9900	18.000	0.0130	5.56	14.82	0.37	6.40	0.74	0.49	0.00	Calculated
47	Link-47	Pipe	Jun-24	Jun-25	34.55	196.41	195.71	2.0300	18.000	0.0130	5.53	14.95	0.37	6.70	0.71	0.47	0.00	Calculated
48	Link-48	Pipe	Jun-25	Jun-15	150.00	195.71	192.73	1.9900	18.000	0.0130	5.53	14.81	0.37	5.95	0.78	0.52	0.00	Calculated
49	Link-49	Pipe	Jun-16	Jun-17	73.94	191.73	188.72	4.0700	18.000	0.0130	7.44	21.19	0.35	8.90	0.72	0.48	0.00	Calculated
50	Link-50	Pipe	Jun-17	Jun-26	73.29	188.72	185.71	4.1100	18.000	0.0130	9.02	21.29	0.42	9.65	0.78	0.52	0.00	Calculated
51	Link-51	Pipe	Jun-26	Jun-27	60.52	185.71	183.27	4.0300	18.000	0.0130	9.00	21.09	0.43	10.03	0.78	0.52	0.00	Calculated
52	Link-52	Pipe	Jun-41	Jun-40	344.14	185.87	183.12	0.8000	48.000	0.0130	5.63	128.41	0.04	5.03	0.58	0.14	0.00	Calculated
53	Link-53	Pipe	Inlet-15	Jun-41	37.25	188.74	188.37	0.9900	18.000	0.0130	6.21	10.47	0.59	5.50	0.92	0.61	0.00	Calculated
54	Link-54	Pipe	Jun-32	Jun-43	33.90	165.77	165.08	2.0400	36.000	0.0130	40.73	95.16	0.43	7.19	2.24	0.75	0.00	Calculated
55	Link-55	Pipe	Jun-43	Jun-28	44.63	165.08	164.75	0.7400	36.000	0.0130	40.89	57.35	0.71	10.41	1.64	0.55	0.00	Calculated
56	Link-56	Pipe	Jun-30	Jun-32	137.65	175.26	166.27	6.5300	30.000	0.0130	38.60	104.82	0.37	14.17	1.42	0.57	0.00	Calculated
57	Link-57	Pipe	Inlet-16	Jun-32	40.00	167.68	167.27	1.0200	18.000	0.0130	2.21	10.63	0.21	4.28	0.64	0.43	0.00	Calculated
58	Link-58	Pipe	Jun-44	Jun-30	196.55	189.66	175.26	7.3300	30.000	0.0130	31.41	111.02	0.28	16.80	1.02	0.41	0.00	Calculated

Link Summary

SN	Element ID	Element Type	From (Inlet) Node	To (Outlet) Node	Length (ft)	Inlet Invert Elevation (ft)	Outlet Invert Elevation (ft)	Average Slope (%)	Diameter or Height (in)	Manning's Roughness	Peak Flow (cfs)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Reported Condition
59	Link-59	Pipe	Inlet-17	Jun-44	13.00	197.34	190.66	51.3800	18.000	0.0130	7.10	75.30	0.09	50.00	0.37	0.25	0.00	Calculated
60	Link-60	Pipe	Jun-45	Jun-44	79.95	190.46	189.66	1.0000	30.000	0.0130	24.39	41.03	0.59	9.36	1.32	0.53	0.00	Calculated
61	Link-61	Pipe	Inlet-18	Inlet-19	100.70	224.50	222.49	2.0000	18.000	0.0130	0.73	14.84	0.05	4.62	0.22	0.15	0.00	Calculated
62	Link-62	Pipe	Inlet-19	Jun-49	34.65	222.49	217.43	14.6000	18.000	0.0130	1.46	40.14	0.04	8.69	0.23	0.15	0.00	Calculated
63	Link-63	Pipe	Jun-50	Jun-47	15.00	209.86	209.56	2.0000	18.000	0.0130	1.49	14.86	0.10	3.46	0.53	0.35	0.00	Calculated
64	Link-64	Pipe	Jun-51	Jun-47	15.00	209.56	209.56	0.0000	18.000	0.0130	2.60	0.86	3.03	2.99	0.74	0.49	0.00	> CAPACITY
65	Link-65	Pipe	Jun-48	Jun-47	31.30	210.50	209.56	3.0000	18.000	0.0130	1.44	18.20	0.08	3.12	0.47	0.31	0.00	Calculated
66	Link-66	Pipe	Jun-47	Jun-46	116.64	209.56	206.75	2.4100	18.000	0.0130	5.36	16.30	0.33	8.23	0.59	0.40	0.00	Calculated
67	Link-67	Pipe	Jun-49	Jun-48	148.30	217.43	210.50	4.6700	18.000	0.0130	1.46	22.71	0.06	6.71	0.27	0.18	0.00	Calculated
68	Link-68	Pipe	Jun-52	Jun-46	15.00	207.05	206.75	2.0000	18.000	0.0130	3.36	14.86	0.23	5.25	0.59	0.39	0.00	Calculated
69	Link-69	Pipe	Jun-46	Jun-45	172.78	206.75	191.46	8.8500	18.000	0.0130	8.56	31.25	0.27	13.88	0.61	0.41	0.00	Calculated
70	Link-70	Pipe	Jun-58	Jun-33	218.98	197.43	195.24	1.0000	18.000	0.0130	10.95	10.50	1.04	6.20	1.50	1.00	7.00	SURCHARGED
71	Link-71	Pipe	Jun-33	Jun-56	119.75	195.24	194.04	1.0000	18.000	0.0130	11.78	10.52	1.12	6.66	1.50	1.00	8.00	SURCHARGED
72	Link-72	Pipe	Jun-57	Jun-56	15.00	194.34	194.04	2.0000	18.000	0.0130	2.77	14.86	0.19	3.99	1.50	1.00	7.00	SURCHARGED
73	Link-73	Pipe	Jun-56	Jun-55	42.00	194.04	193.62	1.0000	18.000	0.0130	14.28	10.50	1.36	8.08	1.50	1.00	8.00	SURCHARGED
74	Link-74	Pipe	Jun-55	Jun-54	28.90	193.62	193.33	1.0000	18.000	0.0130	14.29	10.52	1.36	8.08	1.50	1.00	6.00	SURCHARGED
75	Link-75	Pipe	Jun-54	Jun-53	159.78	193.33	191.73	1.0000	18.000	0.0130	14.29	10.51	1.36	8.09	1.50	1.00	6.00	SURCHARGED
76	Link-76	Pipe	Jun-53	Jun-45	27.00	191.73	191.46	1.0000	18.000	0.0130	15.77	10.50	1.50	9.00	1.46	0.97	0.00	> CAPACITY
77	Link-77	Pipe	Inlet-20	Jun-53	12.50	198.17	191.73	51.5200	18.000	0.0130	1.49	75.40	0.02	9.63	0.82	0.55	0.00	Calculated
78	Link-78	Pipe	Inlet-21	Jun-58	24.44	198.91	197.43	6.0600	18.000	0.0130	2.19	25.85	0.08	5.15	1.50	1.00	5.00	SURCHARGED
79	Link-79	Pipe	Jun-61	Inlet-23	45.00	200.21	199.31	2.0000	18.000	0.0130	5.07	14.86	0.34	5.36	1.50	1.00	4.00	SURCHARGED
80	Link-80	Pipe	Inlet-23	Inlet-22	31.00	199.31	198.30	3.2600	18.000	0.0130	5.95	18.96	0.31	3.50	1.50	1.00	5.00	SURCHARGED
81	Link-81	Pipe	Inlet-22	Jun-59	8.00	198.30	198.03	3.3800	18.000	0.0130	3.73	19.30	0.19	4.12	1.50	1.00	7.00	SURCHARGED
82	Link-82	Pipe	Jun-60	Jun-59	30.00	198.63	198.03	2.0000	18.000	0.0130	1.86	14.86	0.13	2.85	1.50	1.00	6.00	SURCHARGED
83	Link-83	Pipe	Jun-59	Jun-58	59.84	198.03	197.43	1.0000	18.000	0.0130	10.98	10.52	1.04	6.23	1.50	1.00	7.00	SURCHARGED
84	Link-84	Pipe	Jun-63	Jun-62	98.20	199.97	198.98	1.0100	18.000	0.0130	10.28	10.55	0.97	5.84	1.50	1.00	6.00	SURCHARGED
85	Link-85	Pipe	Inlet-24	Jun-62	51.00	199.49	198.98	1.0000	18.000	0.0130	2.63	10.50	0.25	2.62	1.50	1.00	6.00	SURCHARGED
86	Link-86	Pipe	Jun-62	Jun-59	94.68	198.98	198.03	1.0000	18.000	0.0130	9.88	10.52	0.94	5.59	1.50	1.00	6.00	SURCHARGED
87	Link-87	Pipe	Inlet-29	Jun-64	33.36	203.00	202.50	1.5000	18.000	0.0130	5.85	14.44	0.41	5.42	1.50	1.00	4.00	SURCHARGED
88	Link-88	Pipe	Jun-64	Inlet-28	17.00	202.50	201.89	3.5900	18.000	0.0130	12.85	19.90	0.65	7.27	1.50	1.00	4.00	SURCHARGED
89	Link-89	Pipe	Inlet-28	Jun-63	53.00	201.89	199.97	3.6200	18.000	0.0130	13.09	19.99	0.65	7.41	1.50	1.00	5.00	SURCHARGED
90	Link-90	Pipe	Jun-65	Inlet-28	30.00	202.49	201.89	2.0000	18.000	0.0130	2.90	14.86	0.20	2.50	1.50	1.00	4.00	SURCHARGED
91	Link-91	Pipe	Jun-67	Jun-68	15.00	220.18	219.88	2.0000	18.000	0.0130	1.86	14.86	0.13	4.25	0.50	0.33	0.00	Calculated
92	Link-92	Pipe	Jun-66	Inlet-27	15.00	220.93	220.63	2.0000	18.000	0.0130	2.59	14.86	0.17	4.09	0.78	0.52	0.00	Calculated
93	Link-93	Pipe	Inlet-27	Jun-68	74.73	220.63	219.88	1.0000	18.000	0.0130	5.85	10.52	0.56	6.83	0.73	0.49	0.00	Calculated
94	Link-94	Pipe	Inlet-26	Inlet-27	165.42	222.28	220.63	1.0000	18.000	0.0130	3.15	10.49	0.30	3.62	0.74	0.49	0.00	Calculated
95	Link-95	Pipe	Jun-70	Jun-69	15.00	223.68	223.38	2.0000	18.000	0.0130	2.24	14.86	0.15	4.09	0.52	0.35	0.00	Calculated
96	Link-96	Pipe	Jun-71	Jun-69	50.12	223.88	223.38	1.0000	18.000	0.0130	0.36	10.49	0.03	1.13	0.36	0.24	0.00	Calculated
97	Link-97	Pipe	Inlet-25	Jun-71	62.00	224.50	223.88	1.0000	18.000	0.0130	0.37	10.50	0.03	2.75	0.19	0.13	0.00	Calculated
98	Link-98	Pipe	Jun-69	Inlet-26	110.50	223.38	222.28	1.0000	18.000	0.0130	2.53	10.48	0.24	4.36	0.54	0.36	0.00	Calculated
99	Link-99	Pipe	Jun-68	Jun-64	271.91	219.88	202.50	6.3900	18.000	0.0130	7.50	26.56	0.28	5.94	1.02	0.68	0.00	Calculated

Inlet Summary

SN	Element ID	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Initial Water Elevation (ft)	Ponded Area (ft²)	Peak Flow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Allowable Spread (ft)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)
1	Inlet-01	FHWA HEC-22 GENERIC	N/A	On Sag	1	196.50	203.50	0.00	10.00	1.12	N/A	N/A	N/A	10.00	2.53	203.80
2	Inlet-02	FHWA HEC-22 GENERIC	N/A	On Sag	1	188.64	197.00	0.00	10.00	1.12	N/A	N/A	N/A	10.00	2.53	197.30
3	Inlet-03	FHWA HEC-22 GENERIC	N/A	On Sag	1	196.50	201.50	0.00	10.00	1.50	N/A	N/A	N/A	10.00	8.82	201.93
4	Inlet-04	FHWA HEC-22 GENERIC	N/A	On Sag	1	186.78	198.54	0.00	10.00	0.37	N/A	N/A	N/A	10.00	0.75	198.65
5	Inlet-05	FHWA HEC-22 GENERIC	N/A	On Sag	1	185.75	199.02	0.00	10.00	0.75	N/A	N/A	N/A	10.00	1.50	199.24
6	Inlet-06	FHWA HEC-22 GENERIC	N/A	On Sag	1	195.94	200.36	0.00	10.00	0.00	N/A	N/A	N/A	10.00	0.00	200.36
7	Inlet-07	FHWA HEC-22 GENERIC	N/A	On Sag	1	184.51	198.49	0.00	10.00	1.12	N/A	N/A	N/A	10.00	7.32	198.89
8	Inlet-08	FHWA HEC-22 GENERIC	N/A	On Sag	1	198.69	205.97	0.00	10.00	1.12	N/A	N/A	N/A	10.00	7.32	206.37
9	Inlet-09	FHWA HEC-22 GENERIC	N/A	On Sag	1	182.42	192.56	0.00	10.00	4.11	N/A	N/A	N/A	10.00	17.11	193.17
10	Inlet-10	FHWA HEC-22 GENERIC	N/A	On Sag	1	189.55	194.26	0.00	10.00	0.75	N/A	N/A	N/A	10.00	1.50	194.48
11	Inlet-11	FHWA HEC-22 GENERIC	N/A	On Sag	1	188.05	193.22	0.00	10.00	3.74	N/A	N/A	N/A	10.00	16.89	193.81
12	Inlet-12	FHWA HEC-22 GENERIC	N/A	On Sag	1	163.17	174.85	0.00	10.00	7.72	N/A	N/A	N/A	10.00	19.65	175.49
13	Inlet-13	FHWA HEC-22 GENERIC	N/A	On Sag	1	177.82	195.32	0.00	10.00	2.51	N/A	N/A	N/A	10.00	9.25	195.76
14	Inlet-14	FHWA HEC-22 GENERIC	N/A	On Sag	1	191.20	197.70	0.00	10.00	1.67	N/A	N/A	N/A	10.00	9.53	198.14
15	Inlet-15	FHWA HEC-22 GENERIC	N/A	On Sag	1	188.74	193.92	0.00	10.00	6.27	N/A	N/A	N/A	10.00	20.39	194.57
16	Inlet-16	FHWA HEC-22 GENERIC	N/A	On Sag	1	167.68	173.55	0.00	10.00	2.24	N/A	N/A	N/A	10.00	8.59	173.97
17	Inlet-17	FHWA HEC-22 GENERIC	N/A	On Sag	1	197.34	204.34	0.00	10.00	7.10	N/A	N/A	N/A	10.00	18.57	204.96
18	Inlet-18	FHWA HEC-22 GENERIC	N/A	On Sag	1	224.50	228.50	0.00	10.00	0.75	N/A	N/A	N/A	10.00	1.50	228.72
19	Inlet-19	FHWA HEC-22 GENERIC	N/A	On Sag	1	222.49	228.50	0.00	10.00	0.75	N/A	N/A	N/A	10.00	1.50	228.72
20	Inlet-20	FHWA HEC-22 GENERIC	N/A	On Sag	1	198.17	206.17	0.00	10.00	1.50	N/A	N/A	N/A	10.00	6.50	206.55
21	Inlet-21	FHWA HEC-22 GENERIC	N/A	On Sag	1	198.91	206.93	0.00	10.00	1.12	N/A	N/A	N/A	10.00	7.32	207.33
22	Inlet-22	FHWA HEC-22 GENERIC	N/A	On Sag	1	198.30	206.43	0.00	10.00	1.50	N/A	N/A	N/A	10.00	8.82	206.86
23	Inlet-23	FHWA HEC-22 GENERIC	N/A	On Sag	1	199.31	205.80	0.00	10.00	0.37	N/A	N/A	N/A	10.00	2.37	205.94
24	Inlet-24	FHWA HEC-22 GENERIC	N/A	On Sag	1	199.49	205.80	0.00	10.00	0.75	N/A	N/A	N/A	10.00	5.11	206.09
25	Inlet-25	FHWA HEC-22 GENERIC	N/A	On Sag	1	224.50	228.50	0.00	10.00	0.37	N/A	N/A	N/A	10.00	0.75	228.61
26	Inlet-26	FHWA HEC-22 GENERIC	N/A	On Sag	1	222.28	228.50	0.00	10.00	0.75	N/A	N/A	N/A	10.00	1.50	228.72
27	Inlet-27	FHWA HEC-22 GENERIC	N/A	On Sag	1	220.63	228.50	0.00	10.00	0.37	N/A	N/A	N/A	10.00	0.75	228.61
28	Inlet-28	FHWA HEC-22 GENERIC	N/A	On Sag	1	201.89	207.89	0.00	10.00	1.12	N/A	N/A	N/A	10.00	2.53	208.19
29	Inlet-29	FHWA HEC-22 GENERIC	N/A	On Sag	1	203.13	209.48	0.00	10.00	5.85	N/A	N/A	N/A	10.00	10.58	209.94

Junction Input

SN	Element ID	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Ground/Rim (Max) Offset (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Surcharge Elevation (ft)	Surcharge Depth (ft)	Ponded Area (ft^2)	Minimum Pipe Cover (in)
1	Jun-01	194.20	203.00	8.80	0.00	-194.20	6.00	-197.00	0.00	0.00
2	Jun-02	194.50	203.00	8.50	0.00	-194.50	6.00	-197.00	0.00	0.00
3	Jun-03	187.37	198.13	10.76	0.00	-187.37	6.00	-192.13	0.00	0.00
4	Jun-04	192.57	200.56	7.99	0.00	-192.57	0.00	-200.56	0.00	0.00
5	Jun-05	191.25	200.18	8.93	0.00	-191.25	0.00	-200.18	0.00	0.00
6	Jun-06	185.06	198.25	13.19	0.00	-185.06	0.00	-198.25	0.00	0.00
7	Jun-07	183.71	197.90	14.19	0.00	-183.71	0.00	-197.90	0.00	0.00
8	Jun-08	179.21	197.90	18.69	0.00	-179.21	0.00	-197.90	0.00	0.00
9	Jun-09	191.55	200.18	8.63	0.00	-191.55	0.00	-200.18	0.00	0.00
10	Jun-10	191.55	200.18	8.63	0.00	-191.55	0.00	-200.18	0.00	0.00
11	Jun-11	174.97	197.90	22.93	0.00	-174.97	0.00	-197.90	0.00	0.00
12	Jun-12	170.03	185.04	15.01	0.00	-170.03	0.00	-185.04	0.00	0.00
13	Jun-13	174.53	189.00	14.47	0.00	-174.53	0.00	-189.00	0.00	0.00
14	Jun-14	175.69	189.00	13.31	0.00	-175.69	0.00	-189.00	0.00	0.00
15	Jun-15	192.73	200.35	7.62	0.00	-192.73	0.00	-200.35	0.00	0.00
16	Jun-16	191.73	199.48	7.75	0.00	-191.73	0.00	-199.48	0.00	0.00
17	Jun-17	188.72	197.68	8.96	0.00	-188.72	0.00	-197.68	0.00	0.00
18	Jun-18	193.03	200.35	7.32	0.00	-193.03	0.00	-200.35	0.00	0.00
19	Jun-19	193.03	200.35	7.32	0.00	-193.03	0.00	-200.35	0.00	0.00
20	Jun-20	189.32	197.68	8.36	0.00	-189.32	0.00	-197.68	0.00	0.00
21	Jun-21	198.99	205.97	6.98	0.00	-198.99	0.00	-205.97	0.00	0.00
22	Jun-22	198.04	205.23	7.19	0.00	-198.04	0.00	-205.23	0.00	0.00
23	Jun-23	198.34	205.23	6.89	0.00	-198.34	0.00	-205.23	0.00	0.00
24	Jun-24	196.41	203.85	7.44	0.00	-196.41	0.00	-203.85	0.00	0.00
25	Jun-25	195.71	203.26	7.55	0.00	-195.71	0.00	-203.26	0.00	0.00
26	Jun-26	185.71	193.85	8.14	0.00	-185.71	0.00	-193.85	0.00	0.00
27	Jun-27	182.77	192.20	9.43	0.00	-182.77	0.00	-192.20	0.00	0.00
28	Jun-28	164.75	176.43	11.68	0.00	-164.75	0.00	-176.43	0.00	0.00
29	Jun-29	159.33	173.53	14.20	0.00	-159.33	0.00	-173.53	0.00	0.00
30	Jun-30	175.26	182.76	7.50	0.00	-175.26	0.00	-182.76	0.00	0.00
31	Jun-31	175.56	182.76	7.20	0.00	-175.56	0.00	-182.76	0.00	0.00
32	Jun-32	165.77	175.42	9.65	0.00	-165.77	0.00	-175.42	0.00	0.00
33	Jun-33	195.24	207.67	12.43	0.00	-195.24	0.00	-207.67	0.00	0.00
34	Jun-34	195.54	207.67	12.13	0.00	-195.54	0.00	-207.67	0.00	0.00
35	Jun-35	180.60	196.30	15.70	0.00	-180.60	0.00	-196.30	0.00	0.00
36	Jun-36	180.02	198.20	18.18	0.00	-180.02	0.00	-198.20	0.00	0.00
37	Jun-37	160.55	173.53	12.98	0.00	-160.55	0.00	-173.53	0.00	0.00
38	Jun-38	174.05	197.00	22.95	0.00	-174.05	0.00	-197.00	0.00	0.00
39	Jun-39	181.14	198.00	16.86	0.00	-181.14	0.00	-198.00	0.00	0.00
40	Jun-40	181.62	198.20	16.58	0.00	-181.62	0.00	-198.20	0.00	0.00
41	Jun-41	185.87	194.76	8.89	0.00	-185.87	0.00	-194.76	0.00	0.00
42	Jun-43	165.08	176.43	11.35	0.00	-165.08	0.00	-176.43	0.00	0.00
43	Jun-44	189.66	204.10	14.44	0.00	-189.66	0.00	-204.10	0.00	0.00
44	Jun-45	190.46	205.78	15.32	0.00	-190.46	0.00	-205.78	0.00	0.00
45	Jun-46	206.75	213.25	6.50	0.00	-206.75	0.00	-213.25	0.00	0.00
46	Jun-47	209.56	216.55	6.99	0.00	-209.56	0.00	-216.55	0.00	0.00
47	Jun-48	210.50	217.00	6.50	0.00	-210.50	0.00	-217.00	0.00	0.00
48	Jun-49	217.43	229.00	11.57	0.00	-217.43	0.00	-229.00	0.00	0.00
49	Jun-50	209.86	216.55	6.69	0.00	-209.86	0.00	-216.55	0.00	0.00
50	Jun-51	209.56	216.55	6.99	0.00	-209.56	0.00	-216.55	0.00	0.00
51	Jun-52	207.05	213.25	6.20	0.00	-207.05	0.00	-213.25	0.00	0.00
52	Jun-53	191.73	205.89	14.16	0.00	-191.73	0.00	-205.89	0.00	0.00
53	Jun-54	193.33	206.87	13.54	0.00	-193.33	0.00	-206.87	0.00	0.00
54	Jun-55	193.62	206.87	13.25	0.00	-193.62	0.00	-206.87	0.00	0.00
55	Jun-56	194.04	207.04	13.00	0.00	-194.04	0.00	-207.04	0.00	0.00
56	Jun-57	194.34	207.04	12.70	0.00	-194.34	0.00	-207.04	0.00	0.00
57	Jun-58	197.43	206.31	8.88	0.00	-197.43	0.00	-206.31	0.00	0.00
58	Jun-59	198.03	206.06	8.03	0.00	-198.03	0.00	-206.06	0.00	0.00
59	Jun-60	198.63	206.06	7.43	0.00	-198.63	0.00	-206.06	0.00	0.00
60	Jun-61	200.21	205.80	5.59	0.00	-200.21	0.00	-205.80	0.00	0.00
61	Jun-62	198.98	206.30	7.32	0.00	-198.98	0.00	-206.30	0.00	0.00
62	Jun-63	199.97	206.47	6.50	0.00	-199.97	0.00	-206.47	0.00	0.00
63	Jun-64	202.50	209.00	6.50	0.00	-202.50	0.00	-209.00	0.00	0.00
64	Jun-65	202.49	207.89	5.40	0.00	-202.49	0.00	-207.89	0.00	0.00
65	Jun-66	220.93	228.50	7.57	0.00	-220.93	0.00	-228.50	0.00	0.00
66	Jun-67	220.18	228.50	8.32	0.00	-220.18	0.00	-228.50	0.00	0.00
67	Jun-68	219.88	228.50	8.62	0.00	-219.88	0.00	-228.50	0.00	0.00
68	Jun-69	223.38	229.00	5.62	0.00	-223.38	0.00	-229.00	0.00	0.00
69	Jun-70	223.68	229.00	5.32	0.00	-223.68	0.00	-229.00	0.00	0.00
70	Jun-71	223.88	229.00	5.12	0.00	-223.88	0.00	-229.00	0.00	0.00

Junction Results

SN	Element ID	Peak Inflow (cfs)	Peak Lateral Inflow (cfs)	Max HGL Elevation Attained (ft)	Max HGL Depth Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Average HGL Elevation Attained (ft)	Average HGL Depth Attained (ft)	Time of Max HGL Occurrence (days hh:mm)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	Jun-01	6.31	0.00	194.87	0.67	0.00	8.13	194.25	0.05	0 00:05	0 00:00	0.00	0.00
2	Jun-02	5.23	5.23	195.34	0.84	0.00	7.66	194.55	0.05	0 00:05	0 00:00	0.00	0.00
3	Jun-03	7.58	0.00	188.82	1.45	0.00	9.31	187.46	0.09	0 00:07	0 00:00	0.00	0.00
4	Jun-04	0.00	0.00	192.57	0.00	0.00	7.99	192.57	0.00	0 00:00	0 00:00	0.00	0.00
5	Jun-05	5.22	0.00	191.78	0.53	0.00	8.40	191.29	0.04	0 00:05	0 00:00	0.00	0.00
6	Jun-06	11.02	0.00	186.13	1.07	0.00	12.12	185.14	0.08	0 00:06	0 00:00	0.00	0.00
7	Jun-07	11.80	0.00	184.40	0.69	0.00	13.50	183.76	0.05	0 00:06	0 00:00	0.00	0.00
8	Jun-08	11.81	0.00	180.30	1.09	0.00	17.60	179.29	0.08	0 00:06	0 00:00	0.00	0.00
9	Jun-09	2.99	2.99	192.15	0.60	0.00	8.03	191.59	0.04	0 00:05	0 00:00	0.00	0.00
10	Jun-10	2.24	2.24	192.07	0.52	0.00	8.11	191.58	0.03	0 00:05	0 00:00	0.00	0.00
11	Jun-11	18.47	0.00	175.94	0.97	0.00	21.96	175.04	0.07	0 00:07	0 00:00	0.00	0.00
12	Jun-12	34.21	0.00	170.95	0.92	0.00	14.09	170.10	0.07	0 00:07	0 00:00	0.00	0.00
13	Jun-13	16.67	0.00	175.86	1.33	0.00	13.14	174.62	0.09	0 00:05	0 00:00	0.00	0.00
14	Jun-14	16.68	0.00	177.01	1.32	0.00	11.99	175.78	0.09	0 00:05	0 00:00	0.00	0.00
15	Jun-15	7.51	0.00	193.65	0.92	0.00	6.70	192.79	0.06	0 00:05	0 00:00	0.00	0.00
16	Jun-16	7.44	0.00	192.40	0.67	0.00	7.08	191.78	0.05	0 00:05	0 00:00	0.00	0.00
17	Jun-17	9.02	0.00	189.49	0.77	0.00	8.19	188.77	0.05	0 00:06	0 00:00	0.00	0.00
18	Jun-18	2.24	2.24	193.64	0.61	0.00	6.71	193.07	0.04	0 00:05	0 00:00	0.00	0.00
19	Jun-19	0.16	0.00	193.65	0.62	0.00	6.70	193.06	0.03	0 00:05	0 00:00	0.00	0.00
20	Jun-20	1.87	1.87	189.70	0.38	0.00	7.98	189.34	0.02	0 00:05	0 00:00	0.00	0.00
21	Jun-21	0.75	0.75	199.26	0.27	0.00	6.71	199.01	0.02	0 00:05	0 00:00	0.00	0.00
22	Jun-22	5.57	0.00	198.74	0.70	0.00	6.49	198.09	0.05	0 00:05	0 00:00	0.00	0.00
23	Jun-23	3.74	3.74	199.06	0.72	0.00	6.17	198.38	0.04	0 00:05	0 00:00	0.00	0.00
24	Jun-24	5.56	0.00	197.19	0.78	0.00	6.66	196.46	0.05	0 00:05	0 00:00	0.00	0.00
25	Jun-25	5.53	0.00	196.35	0.64	0.00	6.91	195.75	0.04	0 00:05	0 00:00	0.00	0.00
26	Jun-26	9.02	0.00	186.51	0.80	0.00	7.34	185.77	0.06	0 00:06	0 00:00	0.00	0.00
27	Jun-27	12.89	0.00	184.04	1.27	0.00	8.16	182.85	0.08	0 00:05	0 00:00	0.00	0.00
28	Jun-28	40.89	0.00	165.80	1.05	0.00	10.63	164.82	0.07	0 00:05	0 00:00	0.00	0.00
29	Jun-29	71.33	0.00	161.30	1.97	0.00	12.23	159.48	0.15	0 00:06	0 00:00	0.00	0.00
30	Jun-30	37.85	0.00	176.36	1.10	0.00	6.40	175.34	0.08	0 00:05	0 00:00	0.00	0.00
31	Jun-31	6.73	6.73	176.67	1.11	0.00	6.09	175.63	0.07	0 00:05	0 00:00	0.00	0.00
32	Jun-32	40.78	0.00	168.03	2.26	0.00	7.39	165.92	0.15	0 00:05	0 00:00	0.00	0.00
33	Jun-33	11.77	0.00	204.26	9.02	0.00	3.41	195.62	0.38	0 00:04	0 00:00	0.00	0.00
34	Jun-34	3.75	1.87	204.31	8.77	0.00	3.36	195.89	0.35	0 00:04	0 00:00	0.00	0.00
35	Jun-35	16.59	0.00	181.95	1.35	0.00	14.35	180.69	0.09	0 00:05	0 00:00	0.00	0.00
36	Jun-36	16.59	0.00	180.92	0.90	0.00	17.28	180.08	0.06	0 00:05	0 00:00	0.00	0.00
37	Jun-37	38.46	0.00	161.99	1.44	0.00	11.54	160.65	0.10	0 00:07	0 00:00	0.00	0.00
38	Jun-38	19.55	0.00	174.98	0.93	0.00	22.02	174.12	0.07	0 00:07	0 00:00	0.00	0.00
39	Jun-39	7.04	0.00	181.66	0.52	0.00	16.34	181.18	0.04	0 00:06	0 00:00	0.00	0.00
40	Jun-40	5.63	0.00	182.17	0.55	0.00	16.03	181.66	0.04	0 00:06	0 00:00	0.00	0.00
41	Jun-41	6.21	0.00	186.46	0.59	0.00	8.30	185.91	0.04	0 00:05	0 00:00	0.00	0.00
42	Jun-43	40.73	0.00	167.31	2.23	0.00	9.12	165.24	0.16	0 00:05	0 00:00	0.00	0.00
43	Jun-44	31.22	0.00	190.61	0.95	0.00	13.49	189.73	0.07	0 00:05	0 00:00	0.00	0.00
44	Jun-45	24.26	0.00	192.14	1.68	0.00	13.64	190.59	0.13	0 00:05	0 00:00	0.00	0.00
45	Jun-46	8.60	0.00	207.29	0.54	0.00	5.96	206.79	0.04	0 00:05	0 00:00	0.00	0.00
46	Jun-47	5.41	0.00	210.21	0.65	0.00	6.34	209.60	0.04	0 00:05	0 00:00	0.00	0.00
47	Jun-48	1.46	0.00	210.79	0.29	0.00	6.21	210.52	0.02	0 00:05	0 00:00	0.00	0.00
48	Jun-49	1.46	0.00	217.69	0.26	0.00	11.31	217.45	0.02	0 00:05	0 00:00	0.00	0.00
49	Jun-50	1.50	1.50	210.27	0.41	0.00	6.28	209.89	0.03	0 00:05	0 00:00	0.00	0.00
50	Jun-51	2.62	2.62	210.39	0.83	0.00	6.16	209.62	0.06	0 00:05	0 00:00	0.00	0.00
51	Jun-52	3.37	3.37	207.69	0.64	0.00	5.56	207.09	0.04	0 00:05	0 00:00	0.00	0.00
52	Jun-53	15.77	0.00	196.67	4.94	0.00	9.22	191.91	0.18	0 00:04	0 00:00	0.00	0.00
53	Jun-54	14.29	0.00	199.46	6.13	0.00	7.41	193.58	0.25	0 00:04	0 00:00	0.00	0.00
54	Jun-55	14.28	0.00	200.83	7.21	0.00	6.04	193.92	0.30	0 00:04	0 00:00	0.00	0.00
55	Jun-56	14.27	0.00	202.47	8.43	0.00	4.57	194.39	0.35	0 00:04	0 00:00	0.00	0.00
56	Jun-57	2.62	2.62	202.56	8.22	0.00	4.48	194.66	0.32	0 00:04	0 00:00	0.00	0.00
57	Jun-58	11.91	0.00	205.86	8.43	0.00	0.45	197.81	0.38	0 00:04	0 00:00	0.00	0.00
58	Jun-59	11.22	0.00	206.06	8.03	0.00	0.00	198.43	0.40	0 00:04	0 00:04	0.00	0.00
59	Jun-60	2.84	1.12	206.06	7.43	0.00	0.00	198.97	0.34	0 00:04	0 00:04	0.00	0.00
60	Jun-61	7.13	2.24	205.80	5.59	0.00	0.00	200.45	0.24	0 00:04	0 00:04	0.01	1.00
61	Jun-62	10.28	0.00	206.11	7.13	0.00	0.19	199.34	0.36	0 00:04	0 00:00	0.00	0.00
62	Jun-63	13.09	0.00	206.47	6.50	0.00	0.00	200.31	0.34	0 00:04	0 00:05	0.24	3.00
63	Jun-64	12.86	0.00	209.00	6.50	0.00	0.00	202.77	0.27	0 00:04	0 00:04	0.00	0.00
64	Jun-65	4.28	1.50	207.89	5.40	0.00	0.00	202.72	0.23	0 00:04	0 00:04	0.01	2.00
65	Jun-66	2.62	2.62	221.57	0.64	0.00	6.93	220.97	0.04	0 00:05	0 00:00	0.00	0.00
66	Jun-67	1.87	1.87	220.65	0.47	0.00	7.85	220.21	0.03	0 00:05	0 00:00	0.00	0.00
67	Jun-68	7.54	0.00	220.43	0.55	0.00	8.07	219.92	0.04	0 00:05	0 00:00	0.00	0.00
68	Jun-69	2.57	0.00	223.91	0.53	0.00	5.09	223.42	0.04	0 00:05	0 00:00	0.00	0.00
69	Jun-70	2.24	2.24	224.20	0.52	0.00	4.80	223.71	0.03	0 00:05	0 00:00	0.00	0.00
70	Jun-71	0.37	0.00	224.07	0.19	0.00	4.93	223.89	0.01	0 00:05	0 00:00	0.00	0.00

Pipe Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Pipe Width (in)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate	No. of Barrels
1	Link-01	101.46	183.71	0.00	179.21	0.00	4.50	4.4400	CIRCULAR	24.000	24.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
2	Link-02	25.28	184.51	0.00	183.71	0.00	0.80	3.1600	CIRCULAR	24.000	24.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
3	Link-03	15.35	185.06	0.00	184.51	0.00	0.55	3.5800	CIRCULAR	24.000	24.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
4	Link-04	15.00	191.55	0.00	191.25	0.00	0.30	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
5	Link-05	15.00	191.55	0.00	191.25	0.00	0.30	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
6	Link-06	15.00	194.50	0.00	194.20	0.00	0.30	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
7	Link-07	37.00	179.21	0.00	178.47	3.50	0.74	2.0000	CIRCULAR	24.000	24.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
8	Link-08	50.00	174.53	0.00	173.53	3.50	1.00	2.0000	CIRCULAR	24.000	24.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
9	Link-09	58.00	175.69	0.00	174.53	0.00	1.16	2.0000	CIRCULAR	24.000	24.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
10	Link-10	15.00	193.03	0.00	192.73	0.00	0.30	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
11	Link-11	15.00	193.03	0.00	192.73	0.00	0.30	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
12	Link-12	49.90	192.73	0.00	191.73	0.00	1.00	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
13	Link-13	30.00	189.32	0.00	188.72	0.00	0.60	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
14	Link-14	15.00	198.99	0.00	198.69	0.00	0.30	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
15	Link-15	15.00	198.34	0.00	198.04	0.00	0.30	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
16	Link-16	10.00	182.77	0.00	182.42	0.00	0.35	3.5000	CIRCULAR	24.000	24.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
17	Link-17	50.00	189.55	0.00	188.55	0.50	1.00	2.0000	CIRCULAR	12.000	12.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
18	Link-18	26.40	188.05	0.00	182.77	0.00	5.28	20.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
19	Link-19	63.60	164.75	0.00	159.33	0.00	5.42	8.5200	CIRCULAR	36.000	36.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
20	Link-20	15.00	175.56	0.00	175.26	0.00	0.30	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
21	Link-21	15.00	195.54	0.00	195.24	0.00	0.30	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
22	Link-22	115.00	196.50	0.00	194.20	0.00	2.30	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
23	Link-23	278.00	194.20	0.00	188.64	0.00	5.56	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
24	Link-24	35.00	196.50	0.00	188.64	0.00	7.86	22.4600	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
25	Link-25	254.09	188.64	0.00	187.37	0.00	1.27	0.5000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
26	Link-26	116.91	187.37	0.00	186.78	0.00	0.59	0.5000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
27	Link-27	38.00	185.75	0.00	185.56	0.50	0.19	0.5000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
28	Link-28	140.00	191.25	0.00	185.56	0.50	5.69	4.0600	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
29	Link-29	207.18	186.78	0.00	185.75	0.00	1.03	0.5000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
30	Link-30	32.50	192.57	0.00	191.25	0.00	1.32	4.0600	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
31	Link-31	57.10	195.94	0.00	192.57	0.00	3.37	5.9000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
32	Link-32	52.00	182.42	0.00	180.60	0.00	1.82	3.5000	CIRCULAR	24.000	24.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
33	Link-33	16.50	180.60	0.00	180.02	0.00	0.58	3.5200	CIRCULAR	24.000	24.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
34	Link-34	110.00	180.02	0.00	175.69	0.00	4.33	3.9400	CIRCULAR	24.000	24.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
35	Link-35	30.00	159.33	0.00	158.28	3.89	1.05	3.5000	CIRCULAR	66.000	66.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
36	Link-36	20.70	163.17	0.00	163.05	2.50	0.12	0.5800	CIRCULAR	24.000	24.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
37	Link-37	60.00	160.55	0.00	159.33	0.00	1.22	2.0300	CIRCULAR	66.000	66.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
38	Link-38	343.63	170.03	0.00	160.55	0.00	9.48	2.7600	CIRCULAR	66.000	66.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
39	Link-39	76.60	174.97	0.00	174.05	0.00	0.92	1.2000	CIRCULAR	66.000	66.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
40	Link-40	380.31	174.05	0.00	170.03	0.00	4.02	1.0600	CIRCULAR	66.000	66.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
41	Link-41	24.22	177.82	0.00	176.98	2.93	0.84	3.4700	CIRCULAR	24.000	24.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
42	Link-42	17.00	191.20	0.00	183.14	2.00	8.06	47.4100	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
43	Link-43	518.07	181.14	0.00	174.97	0.00	6.17	1.1900	CIRCULAR	66.000	66.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
44	Link-44	40.00	181.62	0.00	181.14	0.00	0.48	1.2000	CIRCULAR	66.000	66.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
45	Link-45	32.00	198.69	0.00	198.04	0.00	0.65	2.0300	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
46	Link-46	81.91	198.04	0.00	196.41	0.00	1.63	1.9900	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
47	Link-47	34.55	196.41	0.00	195.71	0.00	0.70	2.0300	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
48	Link-48	150.00	195.71	0.00	192.73	0.00	2.98	1.9900	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
49	Link-49	73.94	191.73	0.00	188.72	0.00	3.01	4.0700	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
50	Link-50	73.29	188.72	0.00	185.71	0.00	3.01	4.1100	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
51	Link-51	60.52	185.71	0.00	183.27	0.50	2.44	4.0300	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
52	Link-52	344.14	185.87	0.00	183.12	1.50	2.75	0.8000	CIRCULAR	48.000	48.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
53	Link-53	37.25	188.74	0.00	188.37	2.50	0.37	0.9900	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
54	Link-54	33.90	165.77	0.00	165.08	0.00	0.69	2.0400	CIRCULAR	36.000	36.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
55	Link-55	44.63	165.08	0.00	164.75	0.00	0.33	0.7400	CIRCULAR	36.000	36.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
56	Link-56	137.65	175.26	0.00	166.27	0.50	8.99	6.5300	CIRCULAR	30.000	30.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
57	Link-57	40.00	167.68	0.00	167.27	1.50	0.41	1.0200	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
58	Link-58	196.55	189.66	0.00	175.26	0.00	14.40	7.3300	CIRCULAR	30.000	30.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
59	Link-59	13.00	197.34	0.00	190.66	1.00	6.68	51.3800	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
60	Link-60	79.95	190.46	0.00	189.66	0.00	0.80	1.0000	CIRCULAR	30.000	30.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
61	Link-61	100.70	224.50	0.00	222.49	0.00	2.01	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
62	Link-62	34.65	222.49	0.00	217.43	0.00	5.06	14.6000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
63	Link-63	15.00	209.86	0.00	209.56	0.00	0.30	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
64	Link-64	15.00	209.56	0.00	209.56	0.00	0.00	0.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
65	Link-65	31.30	210.50	0.00	209.56	0.00	0.94	3.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
66	Link-66	116.64	209.56	0.00	206.75	0.00	2.81	2.4100	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
67	Link-67	148.30	217.43	0.00	210.50	0.00	6.93	4.6700	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
68	Link-68	15.00	207.05	0.00	206.75	0.00	0.30	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
69	Link-69	172.78	206.75	0.00	191.46	1.00	15.29	8.8500	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
70	Link-70	218.98	197.43	0.00	195.24	0.00	2.19	1.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
71	Link-71	119.75	195.24	0.00	194.04	0.00	1.20	1.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
72	Link-72	15.00	194.34	0.00	194.04	0.00	0.30	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
73	Link-73	42.00	194.04	0.00	193.62	0.00	0.42	1.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
74	Link-74	28.90	193.62	0.00	193.33	0.00	0.29	1.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
75	Link-75	159.78	193.33	0.00	191.73	0.00	1.60	1.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
76	Link-76	27.00	191.73	0.00	191.46	1.00	0.27	1.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
77	Link-77	12.50	198.17	0.00	191.73	0.00	6.44	51.5200	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
78	Link-78	24.44	198.91	0.00	197.43	0.00	1.48	6.0600	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
79	Link-79	45.00	200.21	0.00	199.31	0.00	0.90	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
80	Link-80	31.00	199.31	0.00	198.30	0.00	1.01	3.2600	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
81	Link-81	8.00	198.30	0.00	198.03	0.00	0.27	3.3800	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
82	Link-82	30.00	198.63	0.00	198.03	0.00	0.60	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1

Pipe Input

SN	Element ID	Length (ft)	Inlet Invert Elevation (ft)	Inlet Invert Offset (ft)	Outlet Invert Elevation (ft)	Outlet Invert Offset (ft)	Total Drop (ft)	Average Slope (%)	Pipe Shape	Pipe Diameter or Height (in)	Pipe Width (in)	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow (cfs)	Flap Gate	No. of Barrels
83	Link-83	59.84	198.03	0.00	197.43	0.00	0.60	1.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
84	Link-84	98.20	199.97	0.00	198.98	0.00	0.99	1.0100	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
85	Link-85	51.00	199.49	0.00	198.98	0.00	0.51	1.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
86	Link-86	94.68	198.98	0.00	198.03	0.00	0.95	1.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
87	Link-87	33.36	203.00	-0.13	202.50	0.00	0.50	1.5000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
88	Link-88	17.00	202.50	0.00	201.89	0.00	0.61	3.5900	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
89	Link-89	53.00	201.89	0.00	199.97	0.00	1.92	3.6200	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
90	Link-90	30.00	202.49	0.00	201.89	0.00	0.60	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
91	Link-91	15.00	220.18	0.00	219.88	0.00	0.30	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
92	Link-92	15.00	220.93	0.00	220.63	0.00	0.30	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
93	Link-93	74.73	220.63	0.00	219.88	0.00	0.75	1.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
94	Link-94	165.42	222.28	0.00	220.63	0.00	1.65	1.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
95	Link-95	15.00	223.68	0.00	223.38	0.00	0.30	2.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
96	Link-96	50.12	223.88	0.00	223.38	0.00	0.50	1.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
97	Link-97	62.00	224.50	0.00	223.88	0.00	0.62	1.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
98	Link-98	110.50	223.38	0.00	222.28	0.00	1.10	1.0000	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1
99	Link-99	271.91	219.88	0.00	202.50	0.00	17.38	6.3900	CIRCULAR	18.000	18.000	0.0130	0.2000	0.5000	0.0000	0.00	No	1

Pipe Results

SN	Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Froude Number	Reported Condition
1	Link-01	11.81	0 00:06	47.64	0.25	8.76	0.19	0.89	0.45	0.00		Calculated
2	Link-02	11.80	0 00:06	40.24	0.29	9.07	0.05	0.86	0.43	0.00		Calculated
3	Link-03	11.03	0 00:06	42.82	0.26	6.58	0.04	1.05	0.53	0.00		Calculated
4	Link-04	2.98	0 00:05	14.86	0.20	4.92	0.05	0.56	0.38	0.00		Calculated
5	Link-05	2.24	0 00:05	14.86	0.15	4.09	0.06	0.52	0.35	0.00		Calculated
6	Link-06	5.23	0 00:05	14.86	0.35	5.93	0.04	0.75	0.50	0.00		Calculated
7	Link-07	11.81	0 00:06	31.99	0.37	7.87	0.08	0.97	0.48	0.00		Calculated
8	Link-08	16.68	0 00:06	31.99	0.52	8.70	0.10	1.18	0.59	0.00		Calculated
9	Link-09	16.67	0 00:05	31.99	0.52	7.57	0.13	1.32	0.66	0.00		Calculated
10	Link-10	2.21	0 00:05	14.86	0.15	4.04	0.06	0.77	0.51	0.00		Calculated
11	Link-11	0.16	0 00:02	14.86	0.01	0.72	0.35	0.77	0.51	0.00		Calculated
12	Link-12	7.44	0 00:05	14.87	0.50	7.83	0.11	0.79	0.53	0.00		Calculated
13	Link-13	1.87	0 00:05	14.86	0.13	3.95	0.13	0.56	0.37	0.00		Calculated
14	Link-14	0.74	0 00:05	14.86	0.05	2.61	0.10	0.33	0.22	0.00		Calculated
15	Link-15	3.73	0 00:05	14.86	0.25	4.56	0.05	0.70	0.47	0.00		Calculated
16	Link-16	12.90	0 00:05	42.32	0.30	6.79	0.02	1.18	0.59	0.00		Calculated
17	Link-17	0.73	0 00:05	5.04	0.15	4.37	0.19	0.27	0.27	0.00		Calculated
18	Link-18	4.44	0 00:05	46.98	0.09	7.61	0.06	0.78	0.52	0.00		Calculated
19	Link-19	41.16	0 00:05	194.71	0.21	11.69	0.09	1.50	0.50	0.00		Calculated
20	Link-20	6.67	0 00:05	14.86	0.45	5.53	0.05	1.10	0.73	0.00		Calculated
21	Link-21	2.23	0 00:04	14.86	0.15	4.23	0.06	1.50	1.00	7.00		SURCHARGED
22	Link-22	1.09	0 00:05	14.86	0.07	2.32	0.83	0.47	0.31	0.00		Calculated
23	Link-23	6.05	0 00:05	14.86	0.41	5.17	0.90	1.04	0.69	0.00		Calculated
24	Link-24	1.49	0 00:05	49.78	0.03	7.51	0.08	0.80	0.53	0.00		Calculated
25	Link-25	7.58	0 00:06	7.43	1.02	4.51	0.94	1.42	0.95	0.00		> CAPACITY
26	Link-26	7.23	0 00:06	7.46	0.97	4.32	0.45	1.43	0.95	0.00		Calculated
27	Link-27	7.58	0 00:07	7.43	1.02	4.83	0.13	1.25	0.83	0.00		> CAPACITY
28	Link-28	5.11	0 00:05	21.18	0.24	9.49	0.25	0.52	0.34	0.00		Calculated
29	Link-29	7.16	0 00:07	7.41	0.97	4.19	0.82	1.42	0.95	0.00		Calculated
30	Link-30	0.00	0 00:00	21.17	0.00	0.00		0.27	0.18	0.00		Calculated
31	Link-31	0.00	0 00:00	25.52	0.00	0.00		0.00	0.00	0.00		Calculated
32	Link-32	16.59	0 00:05	42.32	0.39	8.27	0.10	1.22	0.61	0.00		Calculated
33	Link-33	16.59	0 00:05	42.41	0.39	9.17	0.03	1.12	0.56	0.00		Calculated
34	Link-34	16.68	0 00:05	44.88	0.37	9.40	0.20	1.10	0.55	0.00		Calculated
35	Link-35	71.31	0 00:06	628.24	0.11	12.28	0.04	1.61	0.29	0.00		Calculated
36	Link-36	7.67	0 00:05	17.22	0.45	4.65	0.07	1.04	0.52	0.00		Calculated
37	Link-37	37.97	0 00:07	478.85	0.08	6.38	0.16	1.69	0.31	0.00		Calculated
38	Link-38	33.82	0 00:07	557.76	0.06	9.10	0.63	1.18	0.21	0.00		Calculated
39	Link-39	18.09	0 00:07	368.02	0.05	6.62	0.19	0.95	0.17	0.00		Calculated
40	Link-40	19.53	0 00:07	345.25	0.06	7.53	0.84	0.92	0.17	0.00		Calculated
41	Link-41	2.50	0 00:05	42.13	0.06	6.47	0.06	0.36	0.18	0.00		Calculated
42	Link-42	1.67	0 00:05	72.33	0.02	50.00	0.01	0.17	0.11	0.00		Calculated
43	Link-43	6.73	0 00:06	366.47	0.02	3.84	2.25	0.74	0.13	0.00		Calculated
44	Link-44	5.64	0 00:06	367.86	0.02	4.82	0.14	0.53	0.10	0.00		Calculated
45	Link-45	1.86	0 00:05	14.97	0.12	3.22	0.17	0.54	0.36	0.00		Calculated
46	Link-46	5.56	0 00:05	14.82	0.37	6.40	0.21	0.74	0.49	0.00		Calculated
47	Link-47	5.53	0 00:05	14.95	0.37	6.70	0.09	0.71	0.47	0.00		Calculated
48	Link-48	5.53	0 00:05	14.81	0.37	5.95	0.42	0.78	0.52	0.00		Calculated
49	Link-49	7.44	0 00:06	21.19	0.35	8.90	0.14	0.72	0.48	0.00		Calculated
50	Link-50	9.02	0 00:06	21.29	0.42	9.65	0.13	0.78	0.52	0.00		Calculated
51	Link-51	9.00	0 00:06	21.09	0.43	10.03	0.10	0.78	0.52	0.00		Calculated
52	Link-52	5.63	0 00:06	128.41	0.04	5.03	1.14	0.58	0.14	0.00		Calculated
53	Link-53	6.21	0 00:05	10.47	0.59	5.50	0.11	0.92	0.61	0.00		Calculated
54	Link-54	40.73	0 00:05	95.16	0.43	7.19	0.08	2.24	0.75	0.00		Calculated
55	Link-55	40.89	0 00:05	57.35	0.71	10.41	0.07	1.64	0.55	0.00		Calculated
56	Link-56	38.60	0 00:05	104.82	0.37	14.17	0.16	1.42	0.57	0.00		Calculated
57	Link-57	2.21	0 00:05	10.63	0.21	4.28	0.16	0.64	0.43	0.00		Calculated
58	Link-58	31.41	0 00:05	111.02	0.28	16.80	0.19	1.02	0.41	0.00		Calculated
59	Link-59	7.10	0 00:05	75.30	0.09	50.00	0.00	0.37	0.25	0.00		Calculated
60	Link-60	24.39	0 00:05	41.03	0.59	9.36	0.14	1.32	0.53	0.00		Calculated
61	Link-61	0.73	0 00:05	14.84	0.05	4.62	0.36	0.22	0.15	0.00		Calculated
62	Link-62	1.46	0 00:05	40.14	0.04	8.69	0.07	0.23	0.15	0.00		Calculated
63	Link-63	1.49	0 00:05	14.86	0.10	3.46	0.07	0.53	0.35	0.00		Calculated
64	Link-64	2.60	0 00:05	0.86	3.03	2.99	0.08	0.74	0.49	0.00		> CAPACITY
65	Link-65	1.44	0 00:05	18.20	0.08	3.12	0.17	0.47	0.31	0.00		Calculated
66	Link-66	5.36	0 00:05	16.30	0.33	8.23	0.24	0.59	0.40	0.00		Calculated
67	Link-67	1.46	0 00:05	22.71	0.06	6.71	0.37	0.27	0.18	0.00		Calculated
68	Link-68	3.36	0 00:05	14.86	0.23	5.25	0.05	0.59	0.39	0.00		Calculated
69	Link-69	8.56	0 00:05	31.25	0.27	13.88	0.21	0.61	0.41	0.00		Calculated
70	Link-70	10.95	0 00:08	10.50	1.04	6.20	0.59	1.50	1.00	7.00		SURCHARGED
71	Link-71	11.78	0 00:07	10.52	1.12	6.66	0.30	1.50	1.00	8.00		SURCHARGED
72	Link-72	2.77	0 00:04	14.86	0.19	3.99	0.06	1.50	1.00	7.00		SURCHARGED
73	Link-73	14.28	0 00:05	10.50	1.36	8.08	0.09	1.50	1.00	8.00		SURCHARGED
74	Link-74	14.29	0 00:05	10.52	1.36	8.08	0.06	1.50	1.00	6.00		SURCHARGED
75	Link-75	14.29	0 00:05	10.51	1.36	8.09	0.33	1.50	1.00	6.00		SURCHARGED
76	Link-76	15.77	0 00:05	10.50	1.50	9.00	0.05	1.46	0.97	0.00		> CAPACITY
77	Link-77	1.49	0 00:05	75.40	0.02	9.63	0.02	0.82	0.55	0.00		Calculated
78	Link-78	2.19	0 00:04	25.85	0.08	5.15	0.08	1.50	1.00	5.00		SURCHARGED
79	Link-79	5.07	0 00:04	14.86	0.34	5.36	0.14	1.50	1.00	4.00		SURCHARGED
80	Link-80	5.95	0 00:04	18.96	0.31	3.50	0.15	1.50	1.00	5.00		SURCHARGED
81	Link-81	3.73	0 00:05	19.30	0.19	4.12	0.03	1.50	1.00	7.00		SURCHARGED

Pipe Results

SN	Element ID	Peak Flow (cfs)	Time of Peak Flow Occurrence (days hh:mm)	Design Flow Capacity (cfs)	Peak Flow/ Design Flow Ratio	Peak Flow Velocity (ft/sec)	Travel Time (min)	Peak Flow Depth (ft)	Peak Flow Depth/ Total Depth Ratio	Total Time Surcharged (min)	Froude Number	Reported Condition
82	Link-82	1.86	0 00:04	14.86	0.13	2.85	0.18	1.50	1.00	6.00		SURCHARGED
83	Link-83	10.98	0 00:04	10.52	1.04	6.23	0.16	1.50	1.00	7.00		SURCHARGED
84	Link-84	10.28	0 00:04	10.55	0.97	5.84	0.28	1.50	1.00	6.00		SURCHARGED
85	Link-85	2.63	0 00:05	10.50	0.25	2.62	0.32	1.50	1.00	6.00		SURCHARGED
86	Link-86	9.88	0 00:04	10.52	0.94	5.59	0.28	1.50	1.00	6.00		SURCHARGED
87	Link-87	5.85	0 00:05	14.44	0.41	5.42	0.10	1.50	1.00	4.00		SURCHARGED
88	Link-88	12.85	0 00:05	19.90	0.65	7.27	0.04	1.50	1.00	4.00		SURCHARGED
89	Link-89	13.09	0 00:06	19.99	0.65	7.41	0.12	1.50	1.00	5.00		SURCHARGED
90	Link-90	2.90	0 00:04	14.86	0.20	2.50	0.20	1.50	1.00	4.00		SURCHARGED
91	Link-91	1.86	0 00:05	14.86	0.13	4.25	0.06	0.50	0.33	0.00		Calculated
92	Link-92	2.59	0 00:05	14.86	0.17	4.09	0.06	0.78	0.52	0.00		Calculated
93	Link-93	5.85	0 00:05	10.52	0.56	6.83	0.18	0.73	0.49	0.00		Calculated
94	Link-94	3.15	0 00:05	10.49	0.30	3.62	0.76	0.74	0.49	0.00		Calculated
95	Link-95	2.24	0 00:05	14.86	0.15	4.09	0.06	0.52	0.35	0.00		Calculated
96	Link-96	0.36	0 00:05	10.49	0.03	1.13	0.74	0.36	0.24	0.00		Calculated
97	Link-97	0.37	0 00:05	10.50	0.03	2.75	0.38	0.19	0.13	0.00		Calculated
98	Link-98	2.53	0 00:05	10.48	0.24	4.36	0.42	0.54	0.36	0.00		Calculated
99	Link-99	7.50	0 00:05	26.56	0.28	5.94	0.76	1.02	0.68	0.00		Calculated

Inlet Input

SN	Element ID	Inlet Manufacturer	Manufacturer Part Number	Inlet Location	Number of Inlets	Catchbasin Invert Elevation (ft)	Max (Rim) Elevation (ft)	Inlet Depth (ft)	Initial Water Elevation (ft)	Initial Water Depth (ft)	Ponded Area (ft²)	Grate Clogging Factor (%)
1	Inlet-01	FHWA HEC-22 GENERIC	N/A	On Sag	1	196.50	203.50	7.00	0.00	0.00	10.00	0.00
2	Inlet-02	FHWA HEC-22 GENERIC	N/A	On Sag	1	188.64	197.00	8.36	0.00	0.00	10.00	0.00
3	Inlet-03	FHWA HEC-22 GENERIC	N/A	On Sag	1	196.50	201.50	5.00	0.00	0.00	10.00	0.00
4	Inlet-04	FHWA HEC-22 GENERIC	N/A	On Sag	1	186.78	198.54	11.76	0.00	0.00	10.00	0.00
5	Inlet-05	FHWA HEC-22 GENERIC	N/A	On Sag	1	185.75	199.02	13.27	0.00	0.00	10.00	0.00
6	Inlet-06	FHWA HEC-22 GENERIC	N/A	On Sag	1	195.94	200.36	4.42	0.00	0.00	10.00	0.00
7	Inlet-07	FHWA HEC-22 GENERIC	N/A	On Sag	1	184.51	198.49	13.98	0.00	0.00	10.00	0.00
8	Inlet-08	FHWA HEC-22 GENERIC	N/A	On Sag	1	198.69	205.97	7.28	0.00	0.00	10.00	0.00
9	Inlet-09	FHWA HEC-22 GENERIC	N/A	On Sag	1	182.42	192.56	10.14	0.00	0.00	10.00	0.00
10	Inlet-10	FHWA HEC-22 GENERIC	N/A	On Sag	1	189.55	194.26	4.71	0.00	0.00	10.00	0.00
11	Inlet-11	FHWA HEC-22 GENERIC	N/A	On Sag	1	188.05	193.22	5.17	0.00	0.00	10.00	0.00
12	Inlet-12	FHWA HEC-22 GENERIC	N/A	On Sag	1	163.17	174.85	11.68	0.00	0.00	10.00	0.00
13	Inlet-13	FHWA HEC-22 GENERIC	N/A	On Sag	1	177.82	195.32	17.50	0.00	0.00	10.00	0.00
14	Inlet-14	FHWA HEC-22 GENERIC	N/A	On Sag	1	191.20	197.70	6.50	0.00	0.00	10.00	0.00
15	Inlet-15	FHWA HEC-22 GENERIC	N/A	On Sag	1	188.74	193.92	5.18	0.00	0.00	10.00	0.00
16	Inlet-16	FHWA HEC-22 GENERIC	N/A	On Sag	1	167.68	173.55	5.87	0.00	0.00	10.00	0.00
17	Inlet-17	FHWA HEC-22 GENERIC	N/A	On Sag	1	197.34	204.34	7.00	0.00	0.00	10.00	0.00
18	Inlet-18	FHWA HEC-22 GENERIC	N/A	On Sag	1	224.50	228.50	4.00	0.00	0.00	10.00	0.00
19	Inlet-19	FHWA HEC-22 GENERIC	N/A	On Sag	1	222.49	228.50	6.01	0.00	0.00	10.00	0.00
20	Inlet-20	FHWA HEC-22 GENERIC	N/A	On Sag	1	198.17	206.17	8.00	0.00	0.00	10.00	0.00
21	Inlet-21	FHWA HEC-22 GENERIC	N/A	On Sag	1	198.91	206.93	8.02	0.00	0.00	10.00	0.00
22	Inlet-22	FHWA HEC-22 GENERIC	N/A	On Sag	1	198.30	206.43	8.13	0.00	0.00	10.00	0.00
23	Inlet-23	FHWA HEC-22 GENERIC	N/A	On Sag	1	199.31	205.80	6.49	0.00	0.00	10.00	0.00
24	Inlet-24	FHWA HEC-22 GENERIC	N/A	On Sag	1	199.49	205.80	6.31	0.00	0.00	10.00	0.00
25	Inlet-25	FHWA HEC-22 GENERIC	N/A	On Sag	1	224.50	228.50	4.00	0.00	0.00	10.00	0.00
26	Inlet-26	FHWA HEC-22 GENERIC	N/A	On Sag	1	222.28	228.50	6.22	0.00	0.00	10.00	0.00
27	Inlet-27	FHWA HEC-22 GENERIC	N/A	On Sag	1	220.63	228.50	7.87	0.00	0.00	10.00	0.00
28	Inlet-28	FHWA HEC-22 GENERIC	N/A	On Sag	1	201.89	207.89	6.00	0.00	0.00	10.00	0.00
29	Inlet-29	FHWA HEC-22 GENERIC	N/A	On Sag	1	203.13	209.48	6.35	0.00	0.00	10.00	0.00

Inlet Results

SN	Element ID	Peak Flow (cfs)	Peak Lateral Inflow (cfs)	Peak Flow Intercepted by Inlet (cfs)	Peak Flow Bypassing Inlet (cfs)	Inlet Efficiency during Peak Flow (%)	Max Gutter Spread during Peak Flow (ft)	Max Gutter Water Elev. during Peak Flow (ft)	Max Gutter Water Depth during Peak Flow (ft)	Time of Max Depth Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	Inlet-01	1.12	1.12	N/A	N/A	N/A	2.53	203.80	0.30	0 00:05	0.00	0.00
2	Inlet-02	1.12	1.12	N/A	N/A	N/A	2.53	197.30	0.30	0 00:06	0.00	0.00
3	Inlet-03	1.50	1.50	N/A	N/A	N/A	8.82	201.93	0.43	0 00:05	0.00	0.00
4	Inlet-04	0.37	0.37	N/A	N/A	N/A	0.75	198.65	0.11	0 00:07	0.00	0.00
5	Inlet-05	0.75	0.75	N/A	N/A	N/A	1.50	199.24	0.22	0 00:07	0.00	0.00
6	Inlet-06	0.00	0.00	N/A	N/A	N/A	0.00	200.36	0.00	0 00:00	0.00	0.00
7	Inlet-07	1.12	1.12	N/A	N/A	N/A	7.32	198.89	0.40	0 00:06	0.00	0.00
8	Inlet-08	1.12	1.12	N/A	N/A	N/A	7.32	206.37	0.40	0 00:05	0.00	0.00
9	Inlet-09	4.11	4.11	N/A	N/A	N/A	17.11	193.17	0.61	0 00:05	0.00	0.00
10	Inlet-10	0.75	0.75	N/A	N/A	N/A	1.50	194.48	0.22	0 00:05	0.00	0.00
11	Inlet-11	3.74	3.74	N/A	N/A	N/A	16.89	193.81	0.59	0 00:05	0.00	0.00
12	Inlet-12	7.72	7.72	N/A	N/A	N/A	19.65	175.49	0.64	0 00:05	0.00	0.00
13	Inlet-13	2.51	2.51	N/A	N/A	N/A	9.25	195.76	0.44	0 00:05	0.00	0.00
14	Inlet-14	1.67	1.67	N/A	N/A	N/A	9.53	198.14	0.44	0 00:05	0.00	0.00
15	Inlet-15	6.27	6.27	N/A	N/A	N/A	20.39	194.57	0.65	0 00:05	0.00	0.00
16	Inlet-16	2.24	2.24	N/A	N/A	N/A	8.59	173.97	0.42	0 00:05	0.00	0.00
17	Inlet-17	7.10	7.10	N/A	N/A	N/A	18.57	204.96	0.62	0 00:05	0.00	0.00
18	Inlet-18	0.75	0.75	N/A	N/A	N/A	1.50	228.72	0.22	0 00:05	0.00	0.00
19	Inlet-19	0.75	0.75	N/A	N/A	N/A	1.50	228.72	0.22	0 00:05	0.00	0.00
20	Inlet-20	1.50	1.50	N/A	N/A	N/A	6.50	206.55	0.38	0 00:05	0.00	0.00
21	Inlet-21	1.12	1.12	N/A	N/A	N/A	7.32	207.33	0.40	0 00:04	0.00	0.00
22	Inlet-22	1.50	1.50	N/A	N/A	N/A	8.82	206.86	0.43	0 00:04	0.00	0.00
23	Inlet-23	0.37	0.37	N/A	N/A	N/A	2.37	205.94	0.14	0 00:04	0.01	0.00
24	Inlet-24	0.75	0.75	N/A	N/A	N/A	5.11	206.09	0.29	0 00:04	0.09	3.00
25	Inlet-25	0.37	0.37	N/A	N/A	N/A	0.75	228.61	0.11	0 00:05	0.00	0.00
26	Inlet-26	0.75	0.75	N/A	N/A	N/A	1.50	228.72	0.22	0 00:05	0.00	0.00
27	Inlet-27	0.37	0.37	N/A	N/A	N/A	0.75	228.61	0.11	0 00:05	0.00	0.00
28	Inlet-28	1.12	1.12	N/A	N/A	N/A	2.53	208.19	0.30	0 00:04	0.04	1.00
29	Inlet-29	5.85	5.85	N/A	N/A	N/A	10.58	209.94	0.46	0 00:04	0.01	0.00

APPENDIX I – Rational Method: City of San Diego Drainage Design Manual

APPENDIX I

RATIONAL METHOD

Watersheds Less than 0.5 Square Mile

Method of Computing Runoff

Use the Rational Formula Q = CIA where:

Q is the peak rate of flow in cubic feet per second.

C is a runoff coefficient expressed as that percentage of rainfall which becomes surface runoff.

I is the average rainfall intensity in inches per hour for a storm duration equal to the time of concentration (T_c) of the contributing drainage area.

A is the drainage area in acres tributary to design point.

(1) Runoff Coefficient, C

Appendix I-A lists the estimated coefficients for urban areas.

For urban areas select an appropriate coefficient for each type of land use from Table, 2, Appendix I-A. Multiply this coefficient by the percentage of the total area included in that class. The sum of the products for all land uses in San Diego County is the weighted runoff coefficient.

(2) Rainfall Intensity, I

Intensity - duration - frequency curves applicable to all areas within San Diego County are given in Appendix I-B.

(3) Time of Concentration, Tc

The time of concentration is the time required for runoff to flow from the most remote part of the watershed to the outlet point under consideration.

APPENDIX II – Design Runoff: City of San Diego Drainage Design Manual

TABLE 2

RUNOFF COEFFICIENTS (RATIONAL METHOD)

DEVELOPED AREAS (URBAN)

Land Use	Coefficient, C Soil Type (1) D
Residential:	
Single Family	.55
Multi-Units	.70
Mobile Homes	.65
Rural (lots greater than 1/2 acre)	.45
Commercial (2) 80% Impervious	.85
Industrial (2) 90% Impervious	.95

NOTES:

(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 no case shall the final coefficient be less than 0.50. For example: Consider commercial property on D soil.

Actual imperviousness = 50%

Tabulated imperviousness = 80%

$$\text{Revised C} = \frac{50}{80} \times 0.85 = 0.53$$

APPENDIX III – Runoff Coefficients: City of San Diego Drainage Design Manual

TABLE 2

RUNOFF COEFFICIENTS (RATIONAL METHOD)

DEVELOPED AREAS (URBAN)

Land Use	Coefficient, C Soil Type (1)
Residential:	D
Single Family	.55
Multi-Units	.70
Mobile Homes	.65
Rural (lots greater than 1/2 acre)	.45
Commercial (2) 80% Impervious	.85
Industrial (2) 90% Impervious	.95

NOTES:

(1) Type D soil to be used for all areas.

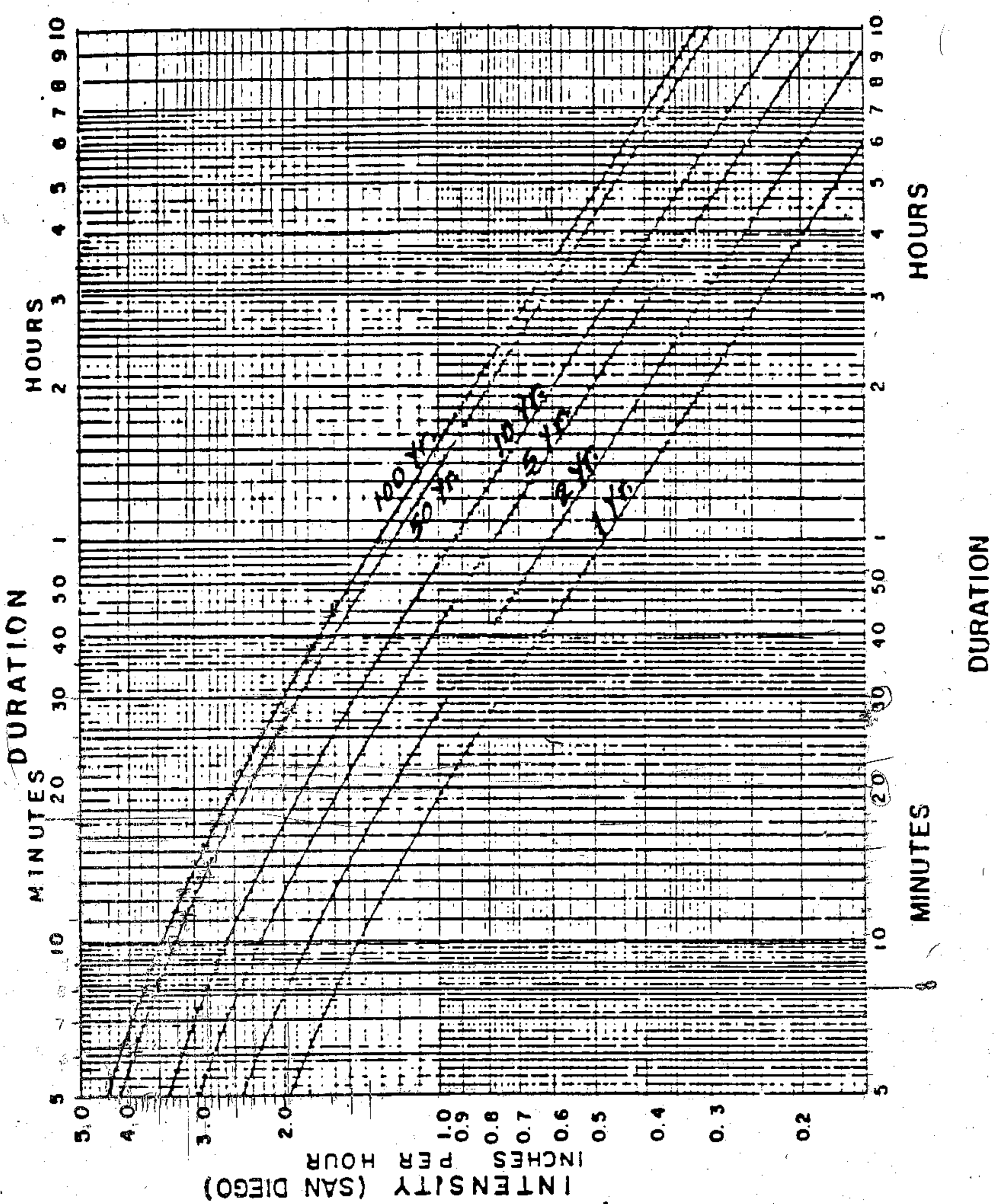
(2) Where actual conditions deviate significantly from the tabulated imperviousness values of 80% or 90%, the values given for coefficient C, may be revised by multiplying 80% or 90% by the ratio of actual imperviousness to the tabulated imperviousness. However, in no case shall the final coefficient be less than 0.50. For example: Consider commercial property on D soil.

Actual imperviousness = 50%

Tabulated imperviousness = 80%

$$\text{Revised C} = \frac{50}{80} \times 0.85 = 0.53$$

APPENDIX IV – Rainfall Intensity-Duration-Frequency Curves: City of San Diego Drainage Design Manual



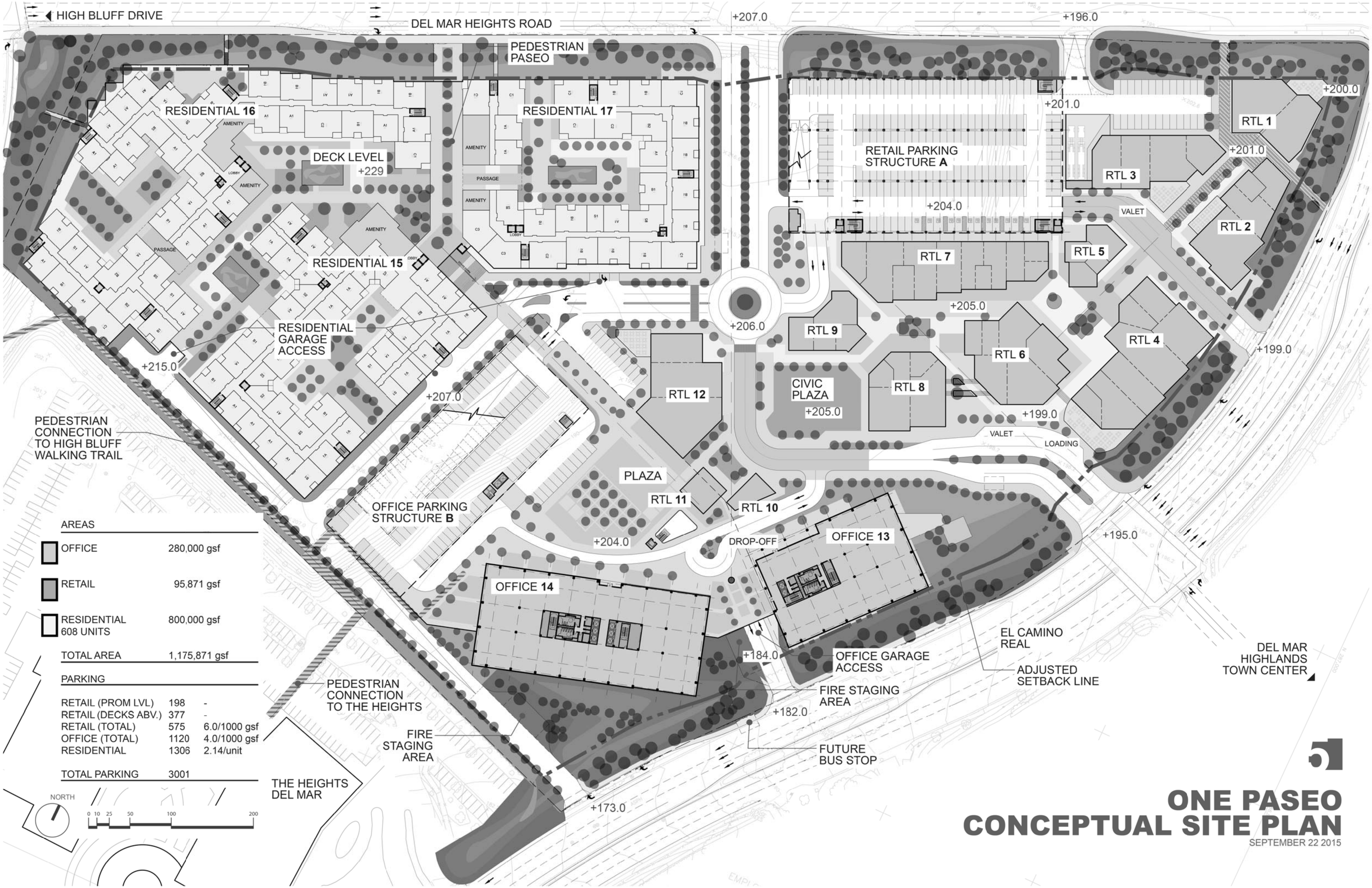
ELEV.	FACTOR
0–1500	1.00
1500–3000	1.25
3000–4000	1.42
4000–5000	1.60
5000–6000	1.70
DESERT	1.25

To obtain correct intensity, multiply intensity on chart by factor for design elevation.

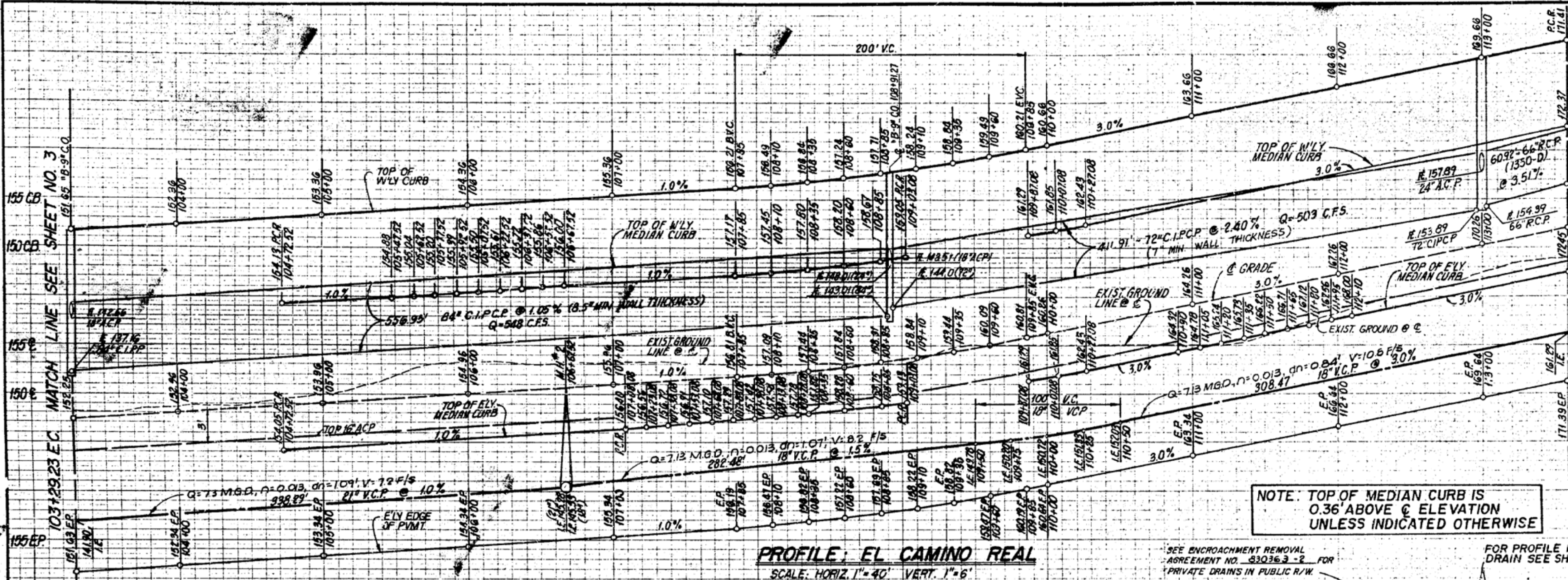
RAINFALL INTENSITY - DURATION - FREQUENCY CURVES for COUNTY OF SAN DIEGO

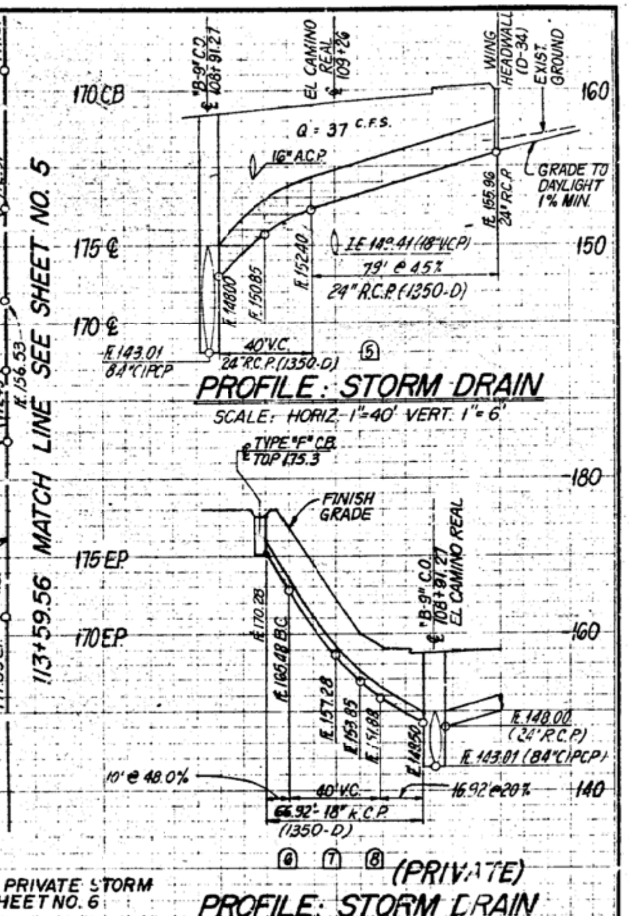
APPENDIX I-B

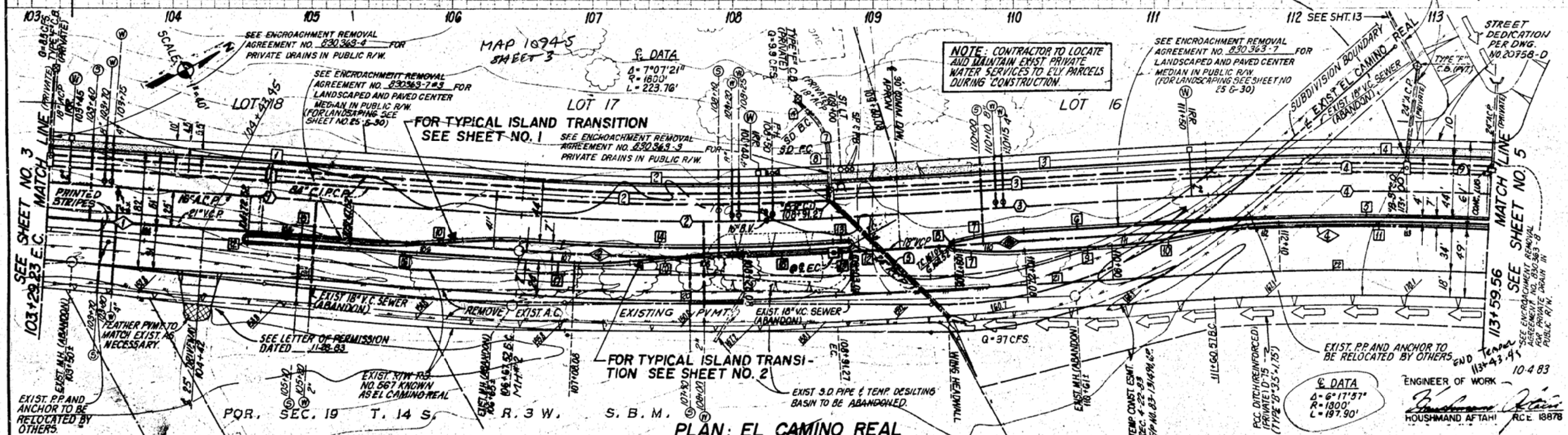
APPENDIX V – Conceptual One Paseo Site Plan


HIGH BLUFF DRIVE
DEL MAR HEIGHTS ROAD
+207.0
+196.0
PEDESTRIAN PASEO
RESIDENTIAL 16
RESIDENTIAL 17
DECK LEVEL +229
RESIDENTIAL 15
RESIDENTIAL GARAGE ACCESS
AMENITY
LOBBY
PASSAGE
+215.0
+200.0
+201.0
+201.0
RTL 1
RTL 2
RTL 3
RTL 4
RTL 5
RTL 6
RTL 7
RTL 8
RTL 9
RTL 10
RTL 11
RTL 12
RETAIL PARKING STRUCTURE A
+204.0
VALET
+205.0
+206.0
+199.0
CIVIC PLAZA
+205.0
+199.0
VALET
LOADING
+207.0
PLAZA
OFFICE PARKING STRUCTURE B
+204.0
DROP-OFF
OFFICE 13
OFFICE 14
+195.0
PEDESTRIAN CONNECTION TO HIGH BLUFF WALKING TRAIL
+184.0
OFFICE GARAGE ACCESS
FIRE STAGING AREA
+182.0
FUTURE BUS STOP
EL CAMINO REAL
ADJUSTED SETBACK LINE
DEL MAR HIGHLANDS TOWN CENTER
PEDESTRIAN CONNECTION TO THE HEIGHTS
FIRE STAGING AREA
THE HEIGHTS DEL MAR
+173.0
AREAS
OFFICE 280,000 gsf
RETAIL 95,871 gsf
RESIDENTIAL 608 UNITS 800,000 gsf
TOTAL AREA 1,175,871 gsf
PARKING
RETAIL (PROM LVL) 198 -
RETAIL (DECKS ABV.) 377 -
RETAIL (TOTAL) 575 6.0/1000 gsf
OFFICE (TOTAL) 1120 4.0/1000 gsf
RESIDENTIAL 1306 2.14/unit
TOTAL PARKING 3001
NORTH
0 10 25 50 100 200
ONE PASEO
CONCEPTUAL SITE PLAN
SEPTEMBER 22 2015

APPENDIX VI – Existing Improvement Plans







STORM DRAIN DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N33°43'47"E		338.29'	84" C.I.P.C.P. (8.5" MIN W/T)
2	Δ=7°07'21"	1759'	218.66'	"
3	N 26°36'26"E		269.30'	72" C.I.P.C.P. (7" MIN W/T)
4	Δ=4°26'18"	1841'	142.61'	"
5	N 74°15'00"E		119.00'	24" R.C.P. (1350-D)
6	N 76°36'26"W		10.00'	18" A.C.P. (2000-D)
7	Δ=40°00'00"	45'	31.42'	↓
8	N63°23'34"W		25.50'	↓
9	Δ=1°53'45"	1841'	60.92'	66" R.C.P. (1350-D)

CHANGE A

CURB DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N33°43'47"E		338.29'	6" TYPE "H" CURB
2	Δ=7°07'21"	1749'	217.42'	↓
3	N 26°36'26"E		269.30'	↓
4	Δ=6°17'57"	1851'	203.50'	↓
5	Δ=6°17'57"	1807'	198.66'	6" TYPE "B-2" CURB
6	N26°36'26"E		133.49'	↓
7	TRANS CURB		50.00'	↓
8	Δ=160°00'00"	2'	5.59'	↓

CURB DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
9	N26°36'26"E		62.92'	6" TYPE "B-2" CURB
10	TRANSITION		120.00'	↓
11	Δ=4°43'33"	1803'	148.71'	↓
12	Δ=180°00'00"	2'	6.28'	↓
13	N26°36'26"E		11.81'	↓
14	Δ=7°07'21"	1793'	222.89'	↓
15	N33°43'47"E		75.00'	↓
16	N33°43'47"E		195.00	↓

CURB DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
17	Δ=1°17'28"	1807'	40.72'	6" TYPE "B-2" CURB
18	Δ=2°23'14"	1797'	74.88'	↓
19	N33°43'47"E		338.29'	6" A.C. BERM
20	Δ=7°07'21"	1831'	227.61'	↓
21	N26°36'26"E		269.30'	↓
22	Δ=6°17'57"	1769'	194.49'	↓

WATER DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N33°43'47"E		338.29'	16" A.C.P.
2	Δ=7°07'21"	1775'	220.65'	↓
3	N26°36'26"E		269.30'	↓
4	Δ=6°17'57"	1825'	200.64'	↓
5				

SEWER DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N33°43'47"E		338.29'	21" V.C.P.
2	Δ=7°07'21"	1800'	223.76'	18" V.C.P.
3	N26°36'26"E		269.30'	↓
4	Δ=6°17'57"	1800'	197.90'	↓
5				
6				
7				
8				

BENCH MARK

DESCRIPTION USC&GS SURVEY MONUMENT
& LOCATION "ZANJA" NORTH-295,109.19
EAST-1,705,827.87
ELEVATION 325.00 DATUM M.S.L.

J-8419 B **PRIVATE CONTRACT** 10-4-83

ENGINEER OF WORK
HOUSHMAND AFTAHI RCE 18878
10-4-83

RICK ENGINEERING COMPANY
5620 FRIARS ROAD, SAN DIEGO, CALIFORNIA 92110 (714) 291-0707
3088 PIO PICO DRIVE, CARLSBAD, CALIFORNIA 92008 (714) 729-4987
PLANNERS • CIVIL ENGINEERS • LAND SURVEYORS

PLANS FOR THE IMPROVEMENT OF
EL CAMINO REAL
IN EMPLOYMENT CENTER DEVELOPMENT UNIT NO. 2B

CITY OF SAN DIEGO, CALIFORNIA
SHEET 4 OF 32 SHEETS
T.M. 83-0800
W.O. NO. 830363

C R Latham 3-26-84
FOR CITY ENGINEER DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL				
CHANGE A	RICK ENG		8-9-84	

CONTROL CERTIFICATION
284-1695
LAMBERT COORDINATES

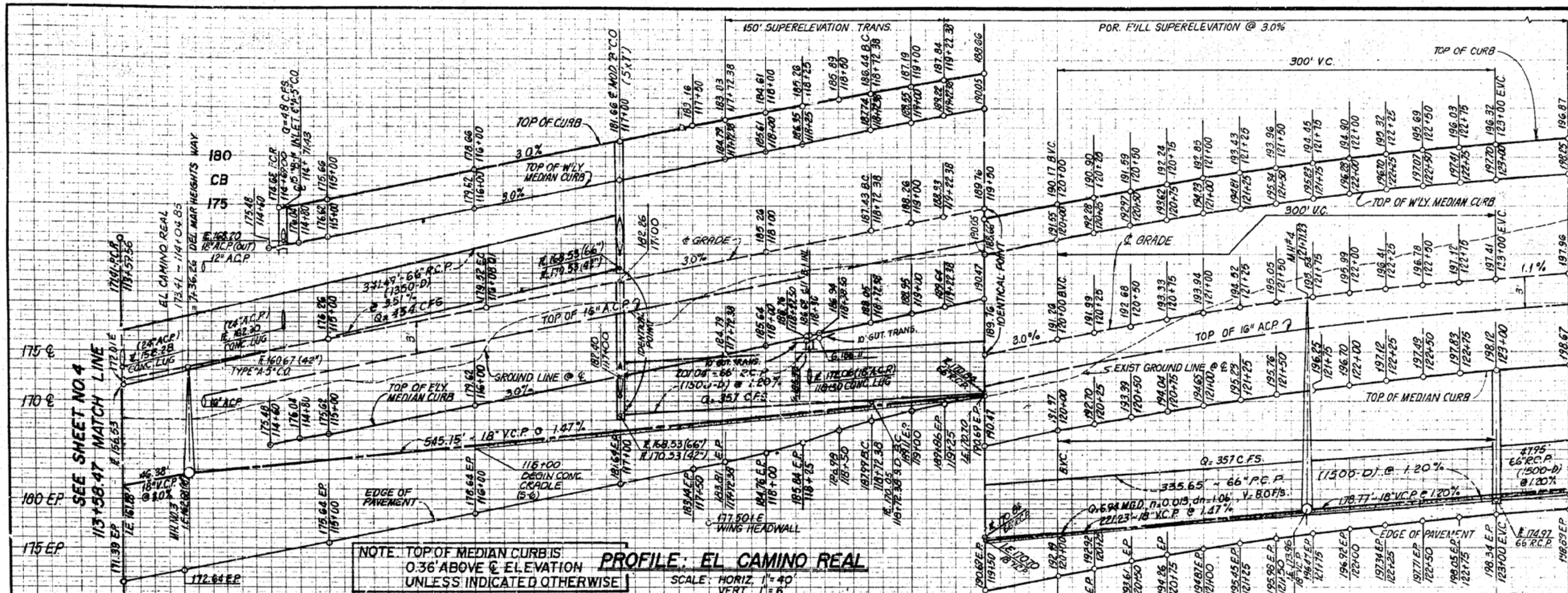
CONTRACTOR DATE STARTED
INSPECTOR DATE COMPLETED

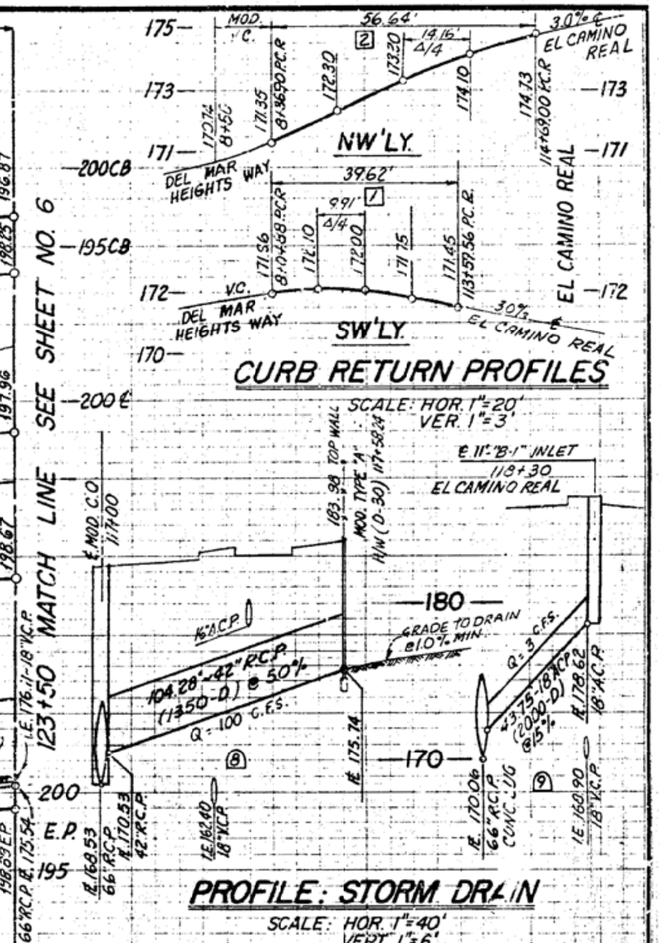
20957-4-D

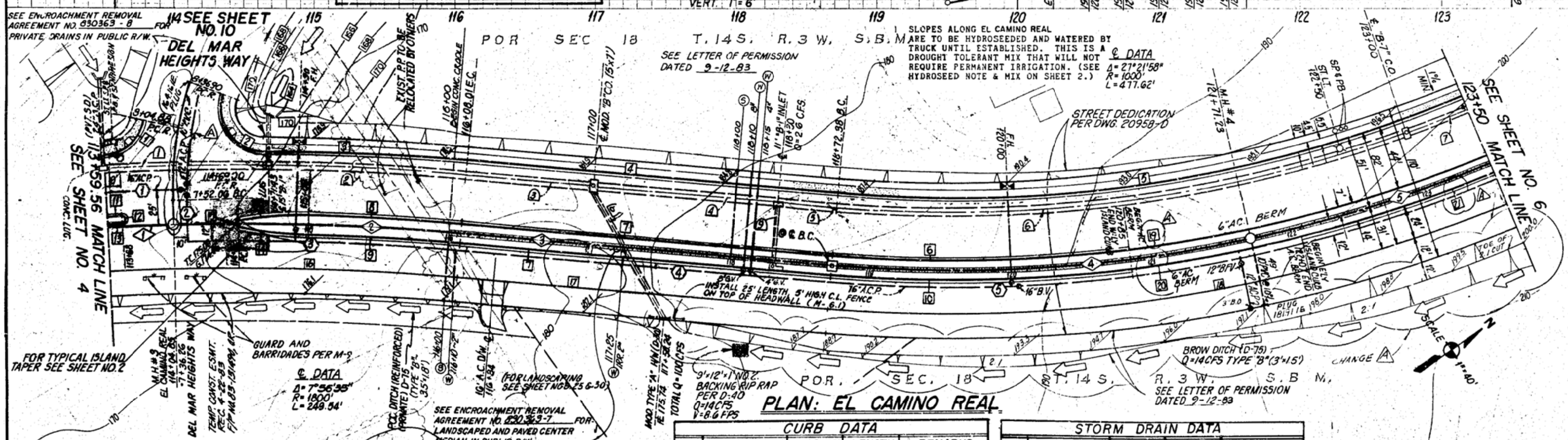
CONSTRUCTION CHANGE

CHANGE A : REV. STORM DRAIN DATA 9.

SEE NEXT SHEET







WATER DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	Δ=1°51'30"	1825'	59.19'	16" A.C.P.
2	N55°37'01"W		37.00'	↓
3	Δ=6°06'23"	1788'	190.56'	↓
4	N40°50'59"E		263.69'	↓
5	Δ=27°21'58"	1012'	483.36'	↓
6				
7				
8				

CURB DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	Δ=76°38'40"	30'	40.13'	6" TYPE "H" CURB
2	Δ=106°38'16"	30'	55.84'	↓
3	Δ=4°28'48"	1851'	144.73'	↓
4	N40°50'59"E		264.37'	↓
5	Δ=27°21'58"	949'	453.26'	↓
6	Δ=12°10'56"	993'	211.13	6" TYPE "B-2" CURB
7	N40°50'59"E		264.37'	↓
18	Δ=3°27'05"	1807'	108.43'	↓
19	Δ=15°11'00"	993'	263.15'	6" AC. BERM.

A CHANGE

CURB DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
9	Δ=3°26'17"	1793'	107.59'	6" TYPE "B-2" CURB
10	Δ=12°10'56"	1007'	214.11'	↓
11	Δ=0°18'12"	1807'	9.57'	↓
12	Δ=180°00'00"	2'	6.28'	↓
13	Δ=0°18'12"	1793'	9.49'	↓
14	TRANS. CURB		50.00'	↓
15	Δ=160°00'00"	2'	5.59'	↓
16	Δ=7°56'35"	1769'	245.24'	6" AC. BERM
17	N40°50'59"E		264.37'	↓
18	Δ=27°21'58"	1031'	492.43'	↓
20	Δ=6°59'24"	1007'	122.85'	↓
21	Δ=8°11'36"	1007'	144.00'	6" TYPE "B-2" CURB

CHANGE A

STORM DRAIN DATA				
NO.	DELTA OR BRG	RADIUS	LENGTH	REMARKS
1	Δ=3°33'39"	1841.00'	114.41'	66" R.C.P. (1350-D)
2	Δ=4°20'51"	1841.00'	139.69'	"
3	N40°50'59"E	-	87.39'	"
4	N40°50'59"E	-	84.22'	66" R.C.P. (1500-D)
5	N40°50'59"E	-	42.38'	"
6	Δ=24°30'03"	959.00'	410.09'	"
7	Δ=2°51'53"	959.00'	47.95'	"
8	N83°06'08"W	-	104.28'	42" R.C.P. (1350-D)
9	N49°09'01"W	-	43.75'	18" A.C.P. (2000-D)
10				

SEWER DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	Δ=1°28'35"	1800'	46.38'	18" V.C.P.
2	Δ=6°28'00"	1800'	203.16'	" "
3	N40°50'59"E		264.37'	" "
4	Δ=17°07'23"	1000'	298.85'	" "
5	Δ=10°14'35"	1000'	178.77'	" "
6				
7				
8				

BENCH MARK

DESCRIPTION USC&GS SURVEY MONUMENT
& LOCATION "ZANJA" NORTH -295,109.19
EAST -1,705,827.87
ELEVATION 325.00 DATUM M.S.L.

J-8419B **PRIVATE CONTRACT** 10-4-83

RICK ENGINEERING COMPANY
5620 FRIARS ROAD, SAN DIEGO, CALIFORNIA 92110 (714) 291-0707
3088 PIO PICO DRIVE, CARLSBAD, CALIFORNIA 92008 (714) 729-4987
PLANNERS • CIVIL ENGINEERS • LAND SURVEYORS

PLANS FOR THE IMPROVEMENT OF

EL CAMINO REAL

IN EMPLOYMENT CENTER DEVELOPMENT UNIT NO. 2B

CITY OF SAN DIEGO, CALIFORNIA
SHEET 5 OF 32 SHEETS

T.M. 83-0800
W.O. NO. 830363

C.R. Follett 3-26-84
FOR CITY ENGINEER DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL				
CHANGE A	RICK ENG.	CR Follett	8-9-84	

CONTROL CERTIFICATION
284-1695
LAMBERT COORDINATES

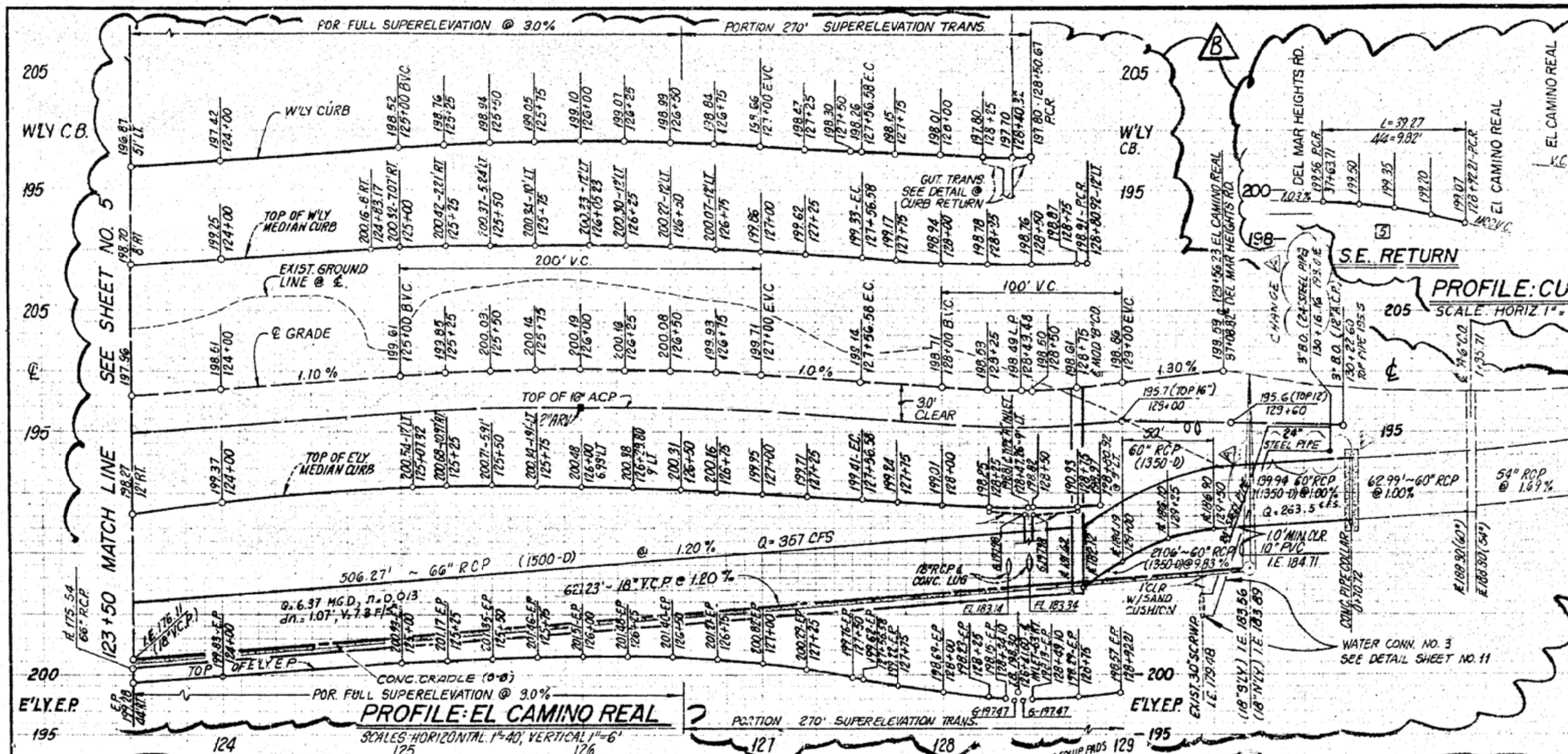
CONTRACTOR ______ DATE STARTED ______
INSPECTOR ______ DATE COMPLETED ______

20957-5-D

ENGINEER OF WORK
HOUSHMAND AFTAHI, R.C.E. 18878

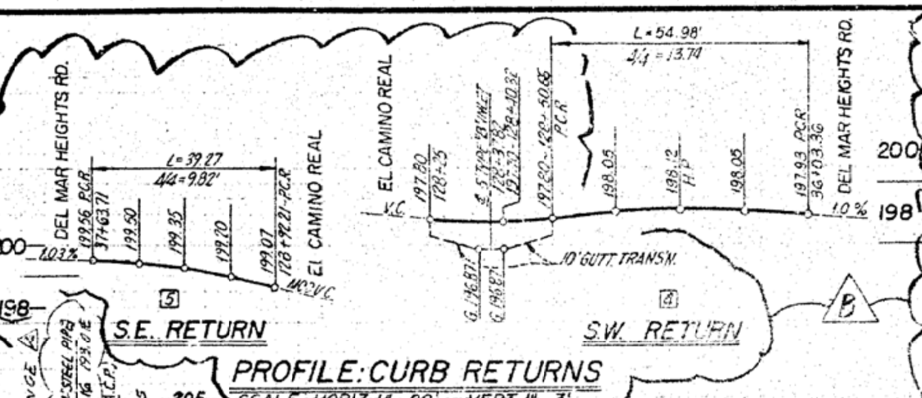
CONSTRUCTION CHANGE

CHANGE A : GRADE 122' OF EL CAMINO REAL FROM STA. 118 + 72.38 TO 123 + 50; ADD 10" P.V.C. AT DEL MAR HEIGHTS WAY ; REV. CURB DATA 6 & 10 ; ADD 19, 20 & 21.



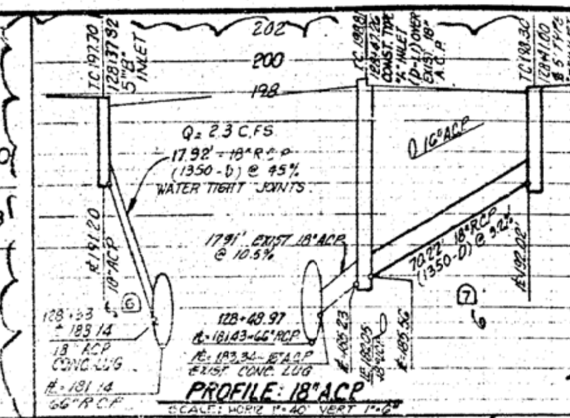
PROFILE: EL CAMINO REAL

SCALES: HORIZONTAL 1"=40', VERTICAL 1"=6'



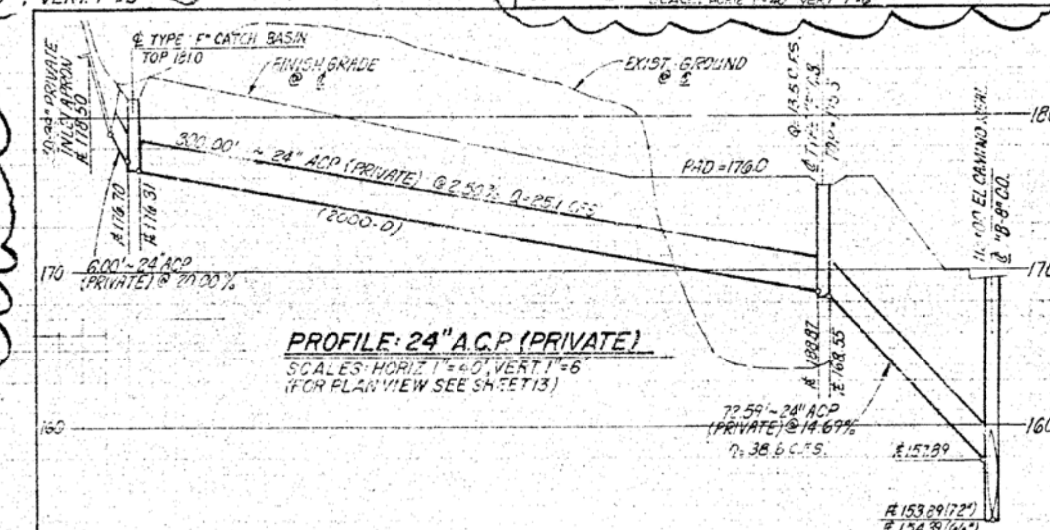
PROFILE: CURB RETURNS

SCALE: HORIZ 1" = 20', VERT. 1" = 3'



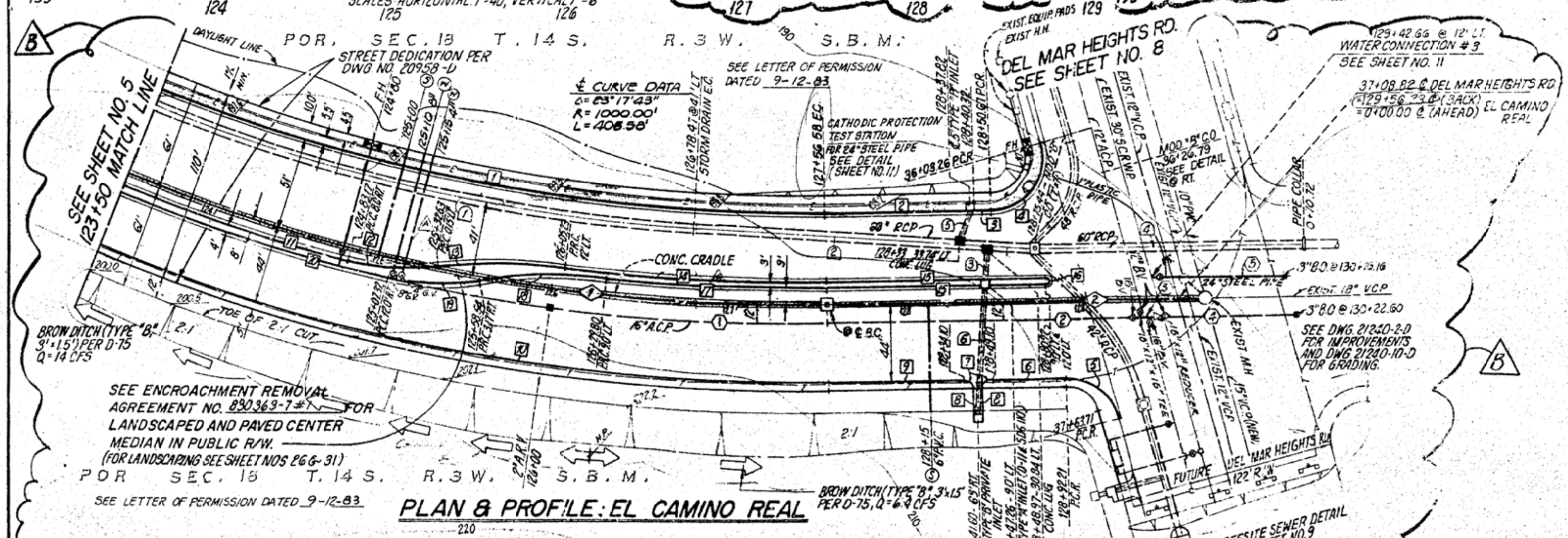
PROFILE: 18" ACP

SCALE: HORIZ 1"=40' VERT 1"=2'



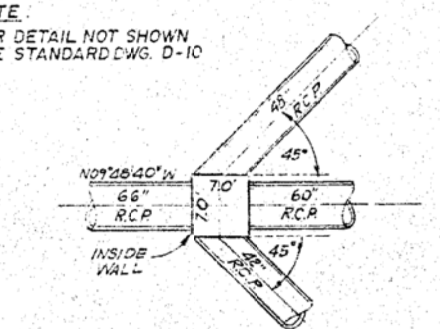
PROFILE: 24" A.C.P. (PRIVATE)

SCALES: HORIZ 1"=40', VERT 1"=6'
(FOR PLAN VIEW SEE SHEET 13)



PLAN & PROFILE: EL CAMINO REAL

NOTE:
FOR DETAIL NOT SHOWN
SEE STANDARD DWG. D-10



@ 128 + 75.44 EL CAMINO REAL

DETAIL: MODIFIED TYPE "B" C.O.

NO SCALE

CURB DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	Δ=23°17'43"	949'	385.84'	6" TYPE "H" CURB
2	N9°48'40"W		83.74'	
3	N9°46'40"W		10.34'	
4	Δ=105°00'00"	30'	54.98'	
5	Δ=75°00'00"	30'	39.27'	6" A.C. BERM
6	N9°45'40"W		43.11'	
7	Δ=90°00'00"	5'	7.85'	
8	N80°11'20"E		14.00'	

CURB DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
9	N9°48'40"W		77.42'	6" A.C. BERM
10	Δ=23°17'43"	1044'	424.47'	
11	Δ=7°37'48"	1088'	134.24'	6" TYPE "B-2" CURB
12	Δ=21°28'34"	135'	50.60'	
13	Δ=14°28'58"	290'	73.30'	
14	Δ=8°40'18"	988'	149.53'	
15	N9°48'40"W		124.34'	
16	Δ=180°00'00"	1.50'	4.71'	

CURB DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
17	Δ=7°15'50"	991'	125.64'	6" TYPE "B 2" CURB
18	Δ=15°20'26"	270'	72.29'	
19	Δ=22°21'30"	135'	52.68'	
20	Δ=9°00'50"	1012'	159.21'	

SEWER DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	Δ=23°17'43"	1000'	406.58'	18" V.C.P.
2	N9°48'40"W		214.65'	

WATER DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	Δ=23°17'43"	1012.00'	411.46'	16" A.C.P.
2	N09°48'40"W		179.47'	
3	N09°48'40"W		5.36'	
4	N09°48'40"W		81.19'	12" A.C.P.
5	N09°48'40"W		73.50'	24" STEEL PIPE

STORM DRAIN DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	Δ=18°49'12"	959'	315.00'	66" R.C.P. (1500-D)
2	N5°20'10"W		191.27'	
3	N84°39'50"W		17.91'	18" A.C.P. (2000-D)
4	N9°48'40"W		148.01'	60" R.C.P. (1350-D)
5	N84°12'19"W		17.92'	18" R.C.P. (1350-D)
6	N84°39'50"W		70.22'	

BENCH MARK

DESCRIPTION USC&GS SURVEY MONUMENT
& LOCATION "ZANJA" NORTH 1885,109.19
EAST 1,705,927.87
ELEVATION 325.00 DATUM M.S.L.

ENGINEER OF WORK

HOUSHMAND AFTAHI RCE. 18879

J-8419 B

PRIVATE CONTRACT 10-4-83

RICK ENGINEERING COMPANY

5620 FRIARS ROAD SAN DIEGO, CALIFORNIA 92110 (714) 291-0707
3088 PIO PICO DRIVE, CARLSBAD, CALIFORNIA 92008 (714) 729-4987

PLANNERS · CIVIL ENGINEERS · LAND SURVEYORS

PLANS FOR THE IMPROVEMENT OF

EL CAMINO REAL

IN EMPLOYMENT CENTER DEVELOPMENT UNIT NO. 2B

CITY OF SAN DIEGO, CALIFORNIA

SHEET 6 OF 32 SHEETS

T.M. 83-0800
W.O. NO. 830363

C.R. Laddock 3-26-84
RCE CITY ENGINEER DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL				
CHANGE A	RICK ENG.	C.R. Lolley	6-4-84	
CHANGE B	RICK ENG.	C.R. Lolley	10-3-85	

CONTROL CERTIFICATION

284-1695
LAMBERT COORDINATES

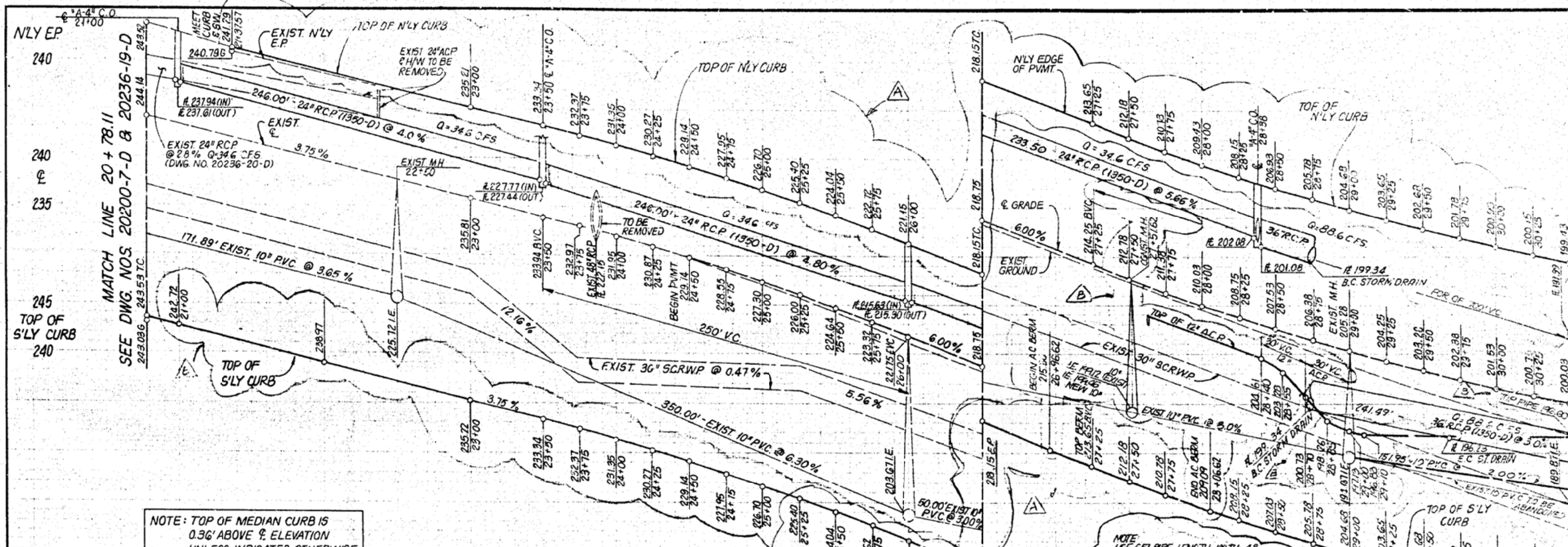
CONTRACTOR ______ DATE STARTED ______
INSPECTOR ______ DATE COMPLETED ______

20957-6-D

CONSTRUCTION CHANGE

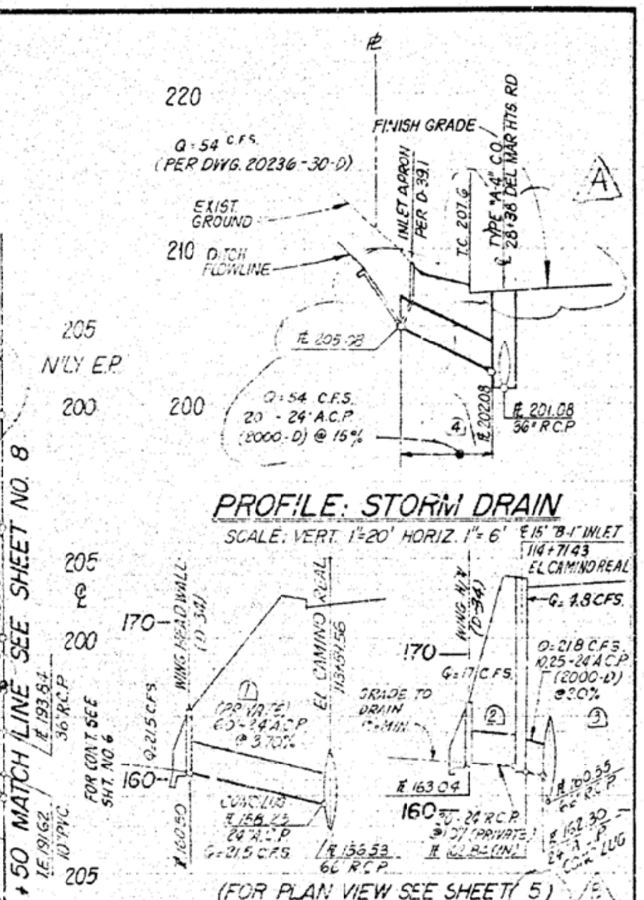
CHANGE A: REVISED PLAN REFLECTED TO GRADING 122' WIDTH OF EL CAMINO REAL. REVISED CURB DATA 9; ADD 14; REV. WATER DATA 5; ADD CATHODIC PROTECTION TEST STATION

CHANGE B: REVISED PLAN & PROFILE TO REFLECT WIDENING OF EL CAMINO REAL. ADD 8" P.V.C. SEWER LATERAL @ STA. 128+15.



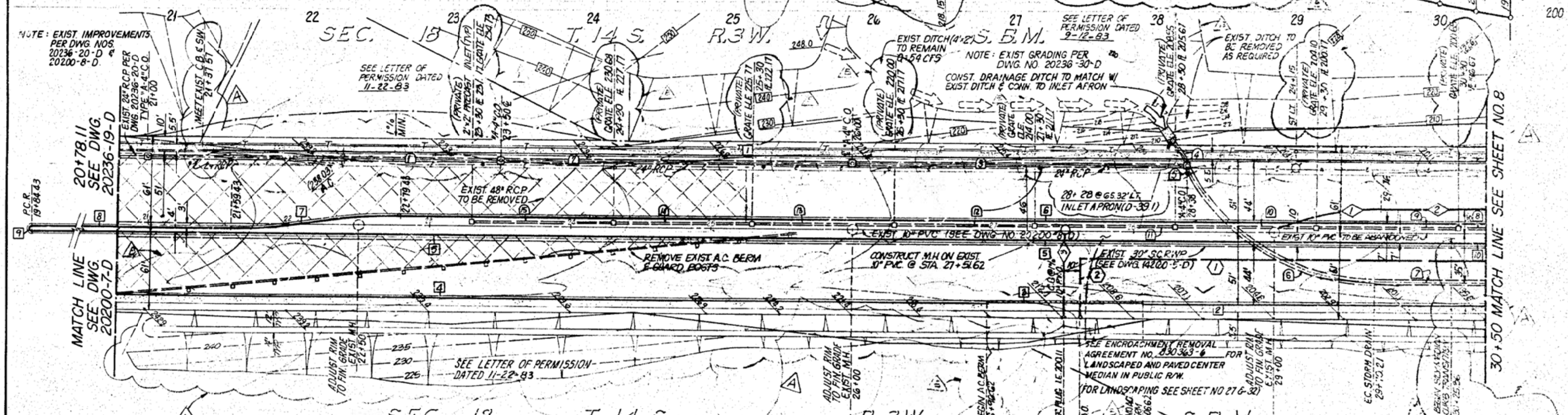
PROFILE: DEL MAR HEIGHTS ROAD

SCALE: HORIZ. 1"=40' VERT. 1"=6'



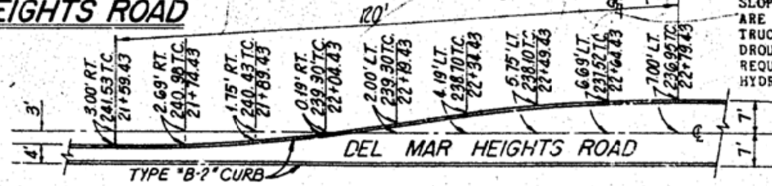
PROFILE: STORM DRAIN

SCALE: HORIZ. 1"=40' VERT. 1"=6'



PLAN: DEL MAR HEIGHTS ROAD

SLOPES ALONG S'LY SIDE OF DEL MAR HEIGHTS RD. ARE TO BE HYDROSEEDED AND WATERED BY TRUCK UNTIL ESTABLISHED. THIS IS A DROUGHT TOLERANT MIX THAT WILL NOT REQUIRE PERMANENT IRRIGATION. (SEE HYDROSEED NOTE & MIX ON SHEET 2.)



LEFT TURN POCKET DETAIL

SCALE: 1"=20'

CURB DATA

NO.	DELTA OR BRG	RADIUS	LENGTH	REMARKS
1	N65°11'20"E	-	912.43'	6"TYPE "H" CURB
2	N65°11'20"E	-	243.38'	" "
3	N65°11'20"E	-	110.00'	6"A.C. BERM
4	N65°11'20"E	-	618.51'	6" TYPE "H" CURB
5	N65°11'20"E	-	1040.93'	6" TYPE "B-2" CURB
6	N65°11' 20"E	-	770.57'	
7	SEE LEFT TURN POCKET DETAIL		120.07'	
8	N65°11'20"E	-	175.00	
9	Δ=180°00'00"	2.00'	6.28'	
10	N 66°14'35"E	-	24.65'	

SEWER DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	Δ=22°19'54"	250.00'	77.95'	10" P.V.C.
2	N65°11'20"E		74.00'	10" P.V.C.
3	N24°48'40"W	-	66.00'	10" PVC

WATER DATA

NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N65°11'20"E	-	288.38'	12" A.C.P.
2	N24°48'40"W	-	46.00'	" "

STORM DRAIN DATA

NO	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N65°11'20"E		246.00'	24"RCP (1350-D)
2	N65°11'20"E		246.00'	
3	N65°11'20"E		233.50'	
4	N54°48'40"W		20.00'	24"A.C.P. (2000-D)
5	N54°48'40"W		4.62'	36"R.C.P. (1350-D)
6	Δ=60°00'00"	150.00'	157.08'	
7	N 65°11'20"E		79.79'	
8	N 65°11'20"E		20.00'	12"A.C.P. (PRIVATE)
9	N65°11'20"E		100.00'	
10	N65°11'20"E		100.00	
11	N65°11'20"E		100.00	
12	N65°11'20"E		100.00'	
13	N65°11'20"E		100.00	
14	N 65°11'20"E		100.00'	
15	N65°11'20"E		100.00'	

BENCH MARK

DESCRIPTION USC & GS SURVEY MONUMENT

& LOCATION "ZANJA" NORTH-295,109.19, EAST -1,705,827.87

ELEVATION 325.00 DATUM M.S.L.

ENGINEER OF WORK

HOUSHMAND AFTAHI R.C.E. 18878

J-6419B

PRIVATE CONTRACT 10-4-83

RICK ENGINEERING COMPANY

5620 FRIARS ROAD SAN DIEGO CALIFORNIA 92110 (714) 291-0707
3088 PIO PICO DRIVE CARLSBAD CALIFORNIA 92008 (714) 729-4987

PLANNERS · CIVIL ENGINEERS · LAND SURVEYORS

PLANS FOR THE IMPROVEMENT OF

DEL MAR HEIGHTS ROAD

IN EMPLOYMENT CENTER DEVELOPMENT UNIT NO. 2B

CITY OF SAN DIEGO, CALIFORNIA

SHEET 7 OF 32 SHEETS

W.O. NO. 830363 T.M. 83-0800

3-26-84

FOR CITY ENGINEER DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL				
CHANGE A			8-9-84	
CHANGE B				

CONTROL CERTIFICATION

284-1695

LAMBERT COORDINATES

CONTRACTOR DATE STARTED

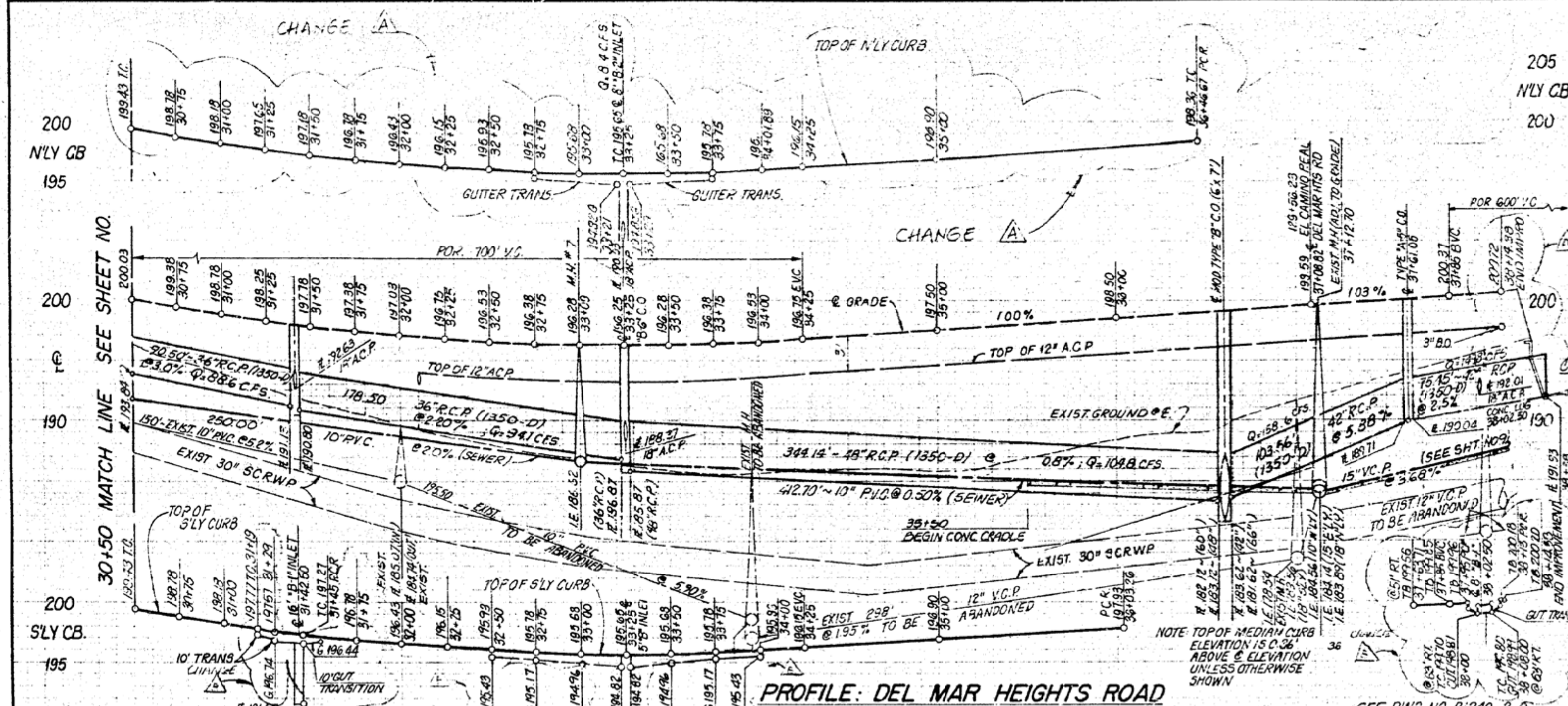
INSPECTOR DATE COMPLETED

20957-7-D

CONSTRUCTION CHANGE

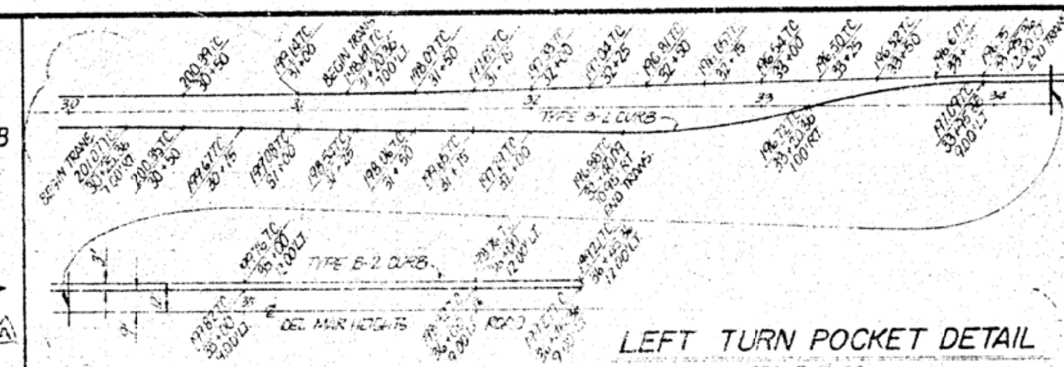
CHANGE A : REVISE PLAN & PROFILE TO REFLECT WIDENING OF DEL MAR HEIGHTS ROAD.

CHANGE B : REVISE PLAN & PROFILE OF DEL MAR HEIGHTS ROAD.



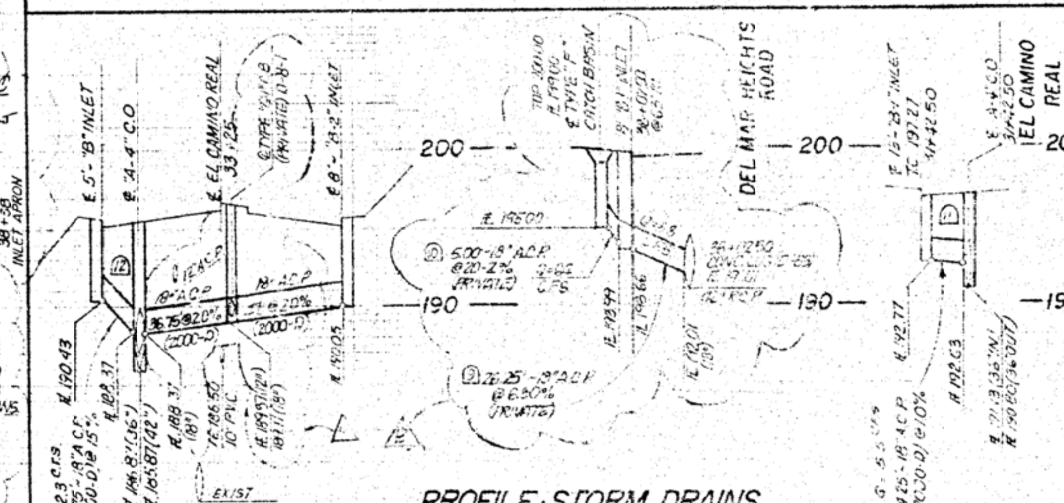
PROFILE: DEL MAR HEIGHTS ROAD

SCALE HORIZ. 1"= 40' VERT. 1"= 6'

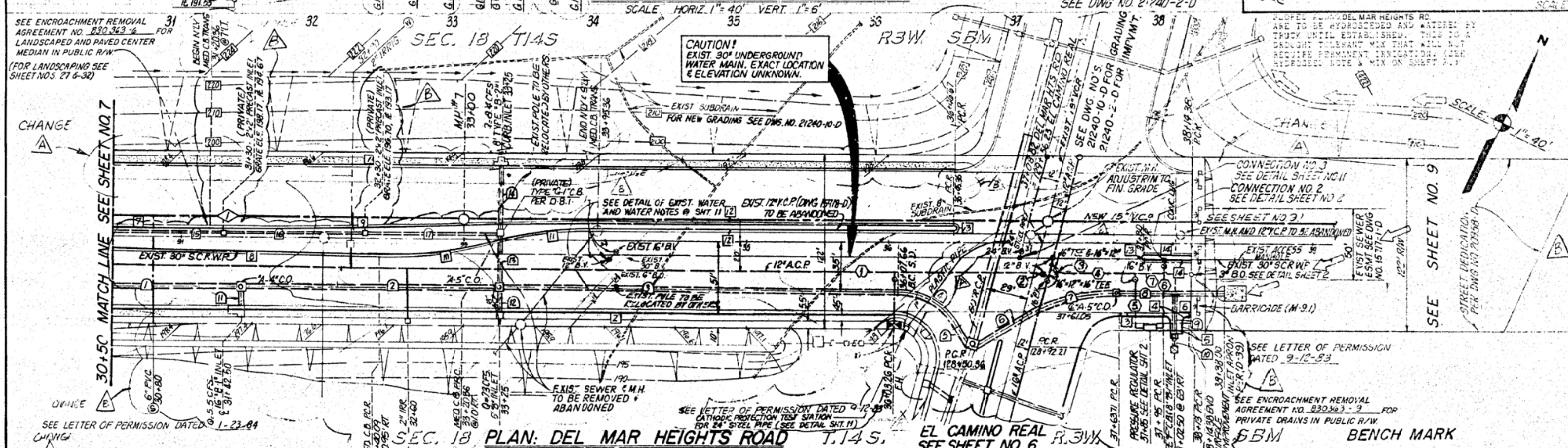


LEFT TURN POCKET DETAIL

SCALE 1"=40'



PROFILE: STORM DRAINS



PLAN: DEL MAR HEIGHTS ROAD

CURB DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N65° 11' 20" E	-	596.67	6" TYPE "H" CURB
2	N65° 11' 20" E	-	553.26'	"
3	N65° 11' 20" E	-	31.29'	6" A.C. BERM
4	Δ=90°00' 00"	50'	7.85'	
5	N24° 48' 40" W	-	7.00'	
6	N65° 11' 20" E	-	1.38'	
7	N65° 11' 20" E	-	70.36'	6" TYPE "B-2" CURB

CURB DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
8	N65° 14' 35" E	-	190.12'	6" TYPE "B-2" CURB
9	N64°08'50" E	-	275.05'	
10	Δ=16°14'36"	286.25'	81.15'	
11	Δ=15°11'21"	286.2'	75.89'	
12	N 65° 11'20" E	-	250.00'	
13	Δ=180°00'00"	1.50'	4.77'	
14	N65°11'20" E	-	34.98'	

WATER DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N65°11'20"E		655.53'	12" A.C.P.
2	N80°11'20"E		10.00'	" "
3	N80°11'20"E		10.00'	16" A.C.P.
4	N65°11'20"E		75.72'	" "
5	N24°48'40"W		39.00'	" "
6	N24°48'40"W		49.00'	16" STEEL PIPE
7	N65°11'20"E		39.38'	16" A.C.P.
8				

SEWER DATA				
NO	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N65°11'20"E		250.00'	10" P.V.C.
2	N65°11'20"E		412.70'	10" P.V.C.

STORM DRAIN DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	N65°11'20" E		[illegible]	36" RCP (1350-D)
2	N65°11'20" E		178.50'	"
3	N65°11'20"E		280.66'	48" RCP (1350-D)
4	Δ=60°00'00"	50.00'	52.36'	"
5	N54°48'40" W		11.12'	"
6	N35°11'20" E		40.73	42" RCP (1350-D)
7	Δ=30°00'00"	120.00'	62.83'	"
8	N65°11'20" E		63.45'	"
9	N24°48'40" W		26.25'	18" A.C.P. PRIVATE
10	N24°48'40" W		5.00'	18" A.C.P. (PRIVATE)
11	N24°48'40" W		14.23'	18" RCP (2000-D)
12	N24°48'40" W		13.75'	
13	N24°48'40" W		36.75'	
14	N24° 48'40" W		47.00'	
15	N65° 11' 20" E		50.00'	12" A.C.P. (PRIVATE)
16	N65° 11' 20" E		100.00'	
17	N65° 11' 20" E		25.00'	

J-8419B PRIVATE CONTRACT 10-4-83

BENCH MARK

DESCRIPTION: USC&G.S. SURVEY MONUMENT
& LOCATION: "ZANJA" NORTH=295,109.19
EAST=1,705,627.87
ELEVATION: 325.00 DATUM: MSL

ENGINEER OF WORK

HOUSHMAND AFTAHI

RICK ENGINEERING COMPANY
5620 FRIARS ROAD, SAN DIEGO, CALIFORNIA 92110 (714) 291-0707
3088 PIO PICO DRIVE, CARLSBAD, CALIFORNIA 92008 (714) 729-4987
PLANNERS · CIVIL ENGINEERS · LAND SURVEYORS

PLANS FOR THE IMPROVEMENT OF
DEL MAR HEIGHTS ROAD
IN EMPLOYMENT CENTER DEVELOPMENT UNIT NO. 23

CITY OF SAN DIEGO, CALIFORNIA
SHEET 8 OF 32 SHEETS

C R Lockwood 3-26-84
CITY ENGINEER DATE

W.O. NO. T.M. 83-0800 / 830363

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL				
CHANGE A	RICK ENG.		9-4-84	
CHANGE B	RICK ENG.			

CONTRACTOR — DATE STARTED
INSPECTOR — DATE COMPLETED

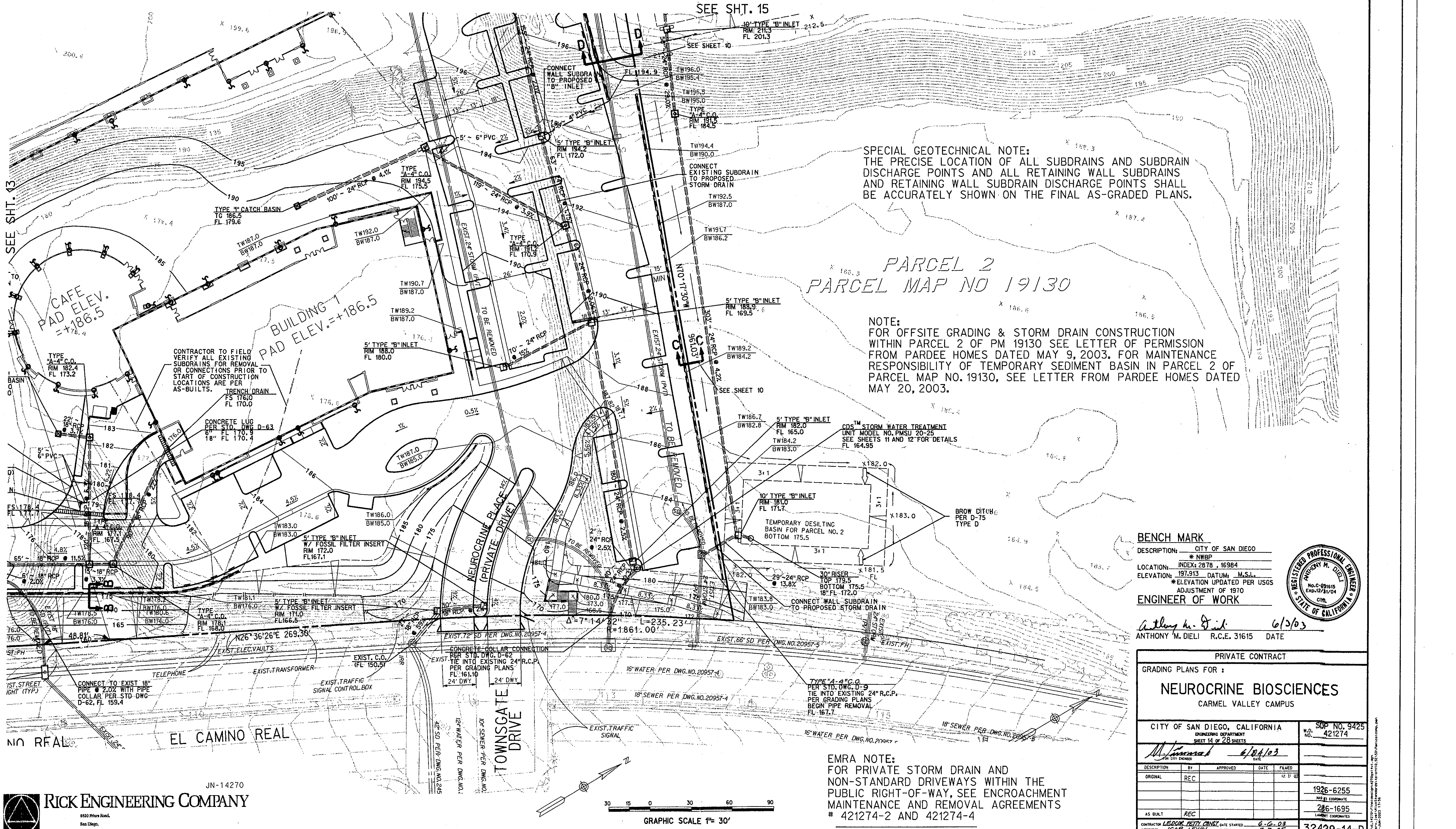
CONTROL CERTIFICATION
284-1695
LAMBERT COORDINATES

20957-8-D

CONSTRUCTION CHANGE

CHANGE B: REV. PLAN & PROFILE OF DEL MAR HEIGHTS RD.

CHANGE A: REVISE PLAN & PROFILE TO REFLECT WIDENING OF DEL MAR HEIGHTS ROAD; REVISE WATER DATA 6; ADD CATHODIC PROTECTION TEST STATION.



SPECIAL GEOTECHNICAL NOTE:
THE PRECISE LOCATION OF ALL SUBDRAINS AND SUBDRAIN DISCHARGE POINTS AND ALL RETAINING WALL SUBDRAINS AND RETAINING WALL SUBDRAIN DISCHARGE POINTS SHALL BE ACCURATELY SHOWN ON THE FINAL AS-GRADED PLANS.

NOTE:
FOR OFFSITE GRADING & STORM DRAIN CONSTRUCTION WITHIN PARCEL 2 OF PM 19130 SEE LETTER OF PERMISSION FROM PARDEE HOMES DATED MAY 9, 2003. FOR MAINTENANCE RESPONSIBILITY OF TEMPORARY SEDIMENT BASIN IN PARCEL 2 OF PARCEL MAP NO. 19130, SEE LETTER FROM PARDEE HOMES DATED MAY 20, 2003.

BENCH MARK
DESCRIPTION: CITY OF SAN DIEGO * NWBP
LOCATION: INDEX: 2878, 16984
ELEVATION: 197.913 DATUM: M.S.L.
* ELEVATION UPDATED PER USGS ADJUSTMENT OF 1970

ENGINEER OF WORK
Anthony M. Dieli 6/3/03
ANTHONY M. DIELI R.C.E. 31615 DATE

REGISTERED PROFESSIONAL ENGINEER ANTHONY M. DIELI No. C-031615 EXP. 12/31/04 CIVIL STATE OF CALIFORNIA

EMRA NOTE:
FOR PRIVATE STORM DRAIN AND NON-STANDARD DRIVEWAYS WITHIN THE PUBLIC RIGHT-OF-WAY, SEE ENCROACHMENT MAINTENANCE AND REMOVAL AGREEMENTS # 421274-2 AND 421274-4

JN-14270
RICK ENGINEERING COMPANY
5620 Friars Road, San Diego, California 92110-2596 (619) 291-0707

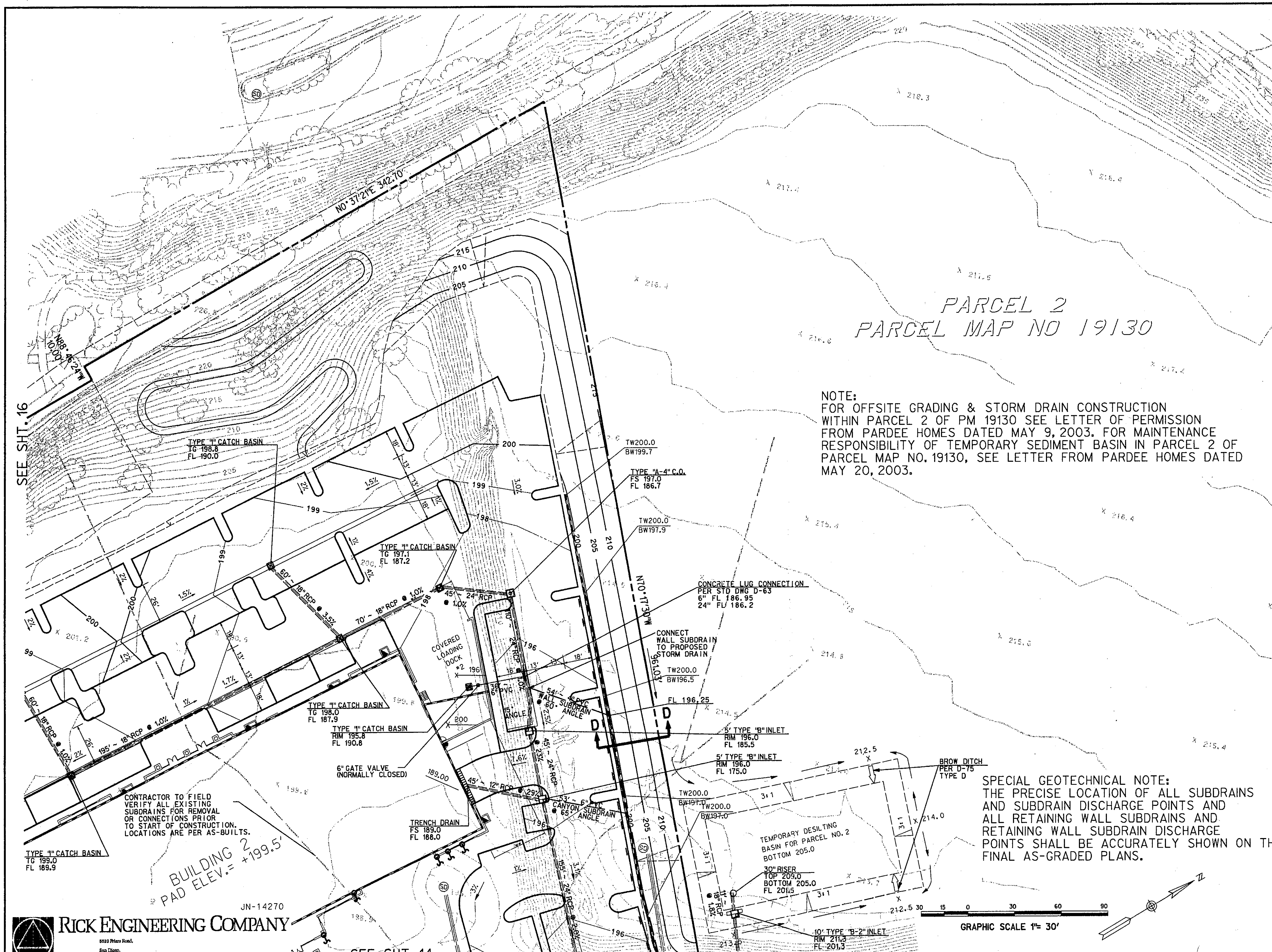
PRIVATE CONTRACT
GRADING PLANS FOR :
NEUROCRINE BIOSCIENCES
CARMEL VALLEY CAMPUS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 14 OF 28 SHEETS
W.O. NO. SDP NO. 9425 421274
FOR CITY ENGINEER 6/24/03 DATE

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	REC			
AS BUILT	REC			

1926-6255 NAD 83 COORDINATE
286-1695 LAMBERT COORDINATES
CONTRACTOR LEDCOR PETTY CONST. DATE STARTED 6-6-03
INSPECTOR IGOR LEVIN DATE COMPLETED 7-7-05
32429-14-D

AS-BUILT



BENCH MARK

DESCRIPTION: CITY OF SAN DIEGO
* NWBP
LOCATION: INDEX: 2878 , 16984
ELEVATION: 197.913 DATUM: M.S.L.
*ELEVATION UPDATED PER USGS ADJUSTMENT OF 1970

ENGINEER OF WORK

Anthony M. Dieli 6/3/03
ANTHONY M. DIELI R.C.E. 31615 DATE

REGISTERED PROFESSIONAL ENGINEER
ANTHONY M. DIELI
No. C031615
Exp. 12/31/04
CIVIL
STATE OF CALIFORNIA

PRIVATE CONTRACT

GRADING PLANS FOR :

NEURROCRINE BIOSCIENCES

CARMEL VALLEY CAMPUS

CITY OF SAN DIEGO, CALIFORNIA
ENGINEERING DEPARTMENT
SHEET 15 OF 28 SHEETS

FOR CITY ENGINEER 6/2/03 DATE

SDP NO. 9425
W.O. NO. 421274

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	REC			
AS BUILT	REC			

1926-6255
NAD 83 COORDINATE
286-1695
LAMBERT COORDINATES

CONTRACTOR LEDCOR PETTY CONST. DATE STARTED 6-6-03
INSPECTOR IGOR LEVIN DATE COMPLETED 7-7-05

32429-15-D

RICK ENGINEERING COMPANY
5620 Friars Road, San Diego, California 92110-2596

AS-BUILT

WATER QUALITY TECHNICAL REPORT

FOR

One Paseo

PTS No. 451328, I.O. No. 24000155

October 16, 2015

Prepared By:

LEPPERT ENGINEERING CORPORATION

5190 GOVERNOR DRIVE, SUITE 205

SAN DIEGO, CA 92122

Job No. NCW 14.01-09.08

Prepared For:

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By: John D. Leppert, RCE 26283

Exp. 3/31/16

REGISTERED PROFESSIONAL ENGINEER
JOHN D. LEPPERT
C 26283
CIVIL
STATE OF CALIFORNIA

12/3/2015

Date

CERTIFICATION

This Water Quality Technical Report (WQTR) has been prepared under the direction of the following Registered Civil Engineer. The Registered Civil Engineer (Engineer) attests to the technical information contained herein and the engineering data upon which the following design, recommendations, conclusions and decisions are based. The selection, sizing, and design of storm water treatment and other control measures in this report meet the requirements of Regional Water Quality Control Board Order R9-2007-0001 and subsequent amendments.

JOHN D. LEPPERT
REGISTERED CIVIL ENGINEER

12/3/2015
DATE

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Water Quality Technical Report
One Paseo
October 16, 2015

Introduction

This Addendum addresses a revised development proposal for the One Paseo project, which was approved in February 2015. This project is referred to as the "Approved Project". The City Council subsequently rescinded some of the project approvals at the request of Kilroy to provide an opportunity to address local community concerns. The redesigned project is referred to as "New One Paseo Project". The focus of this Addendum is to determine whether the analysis and conclusions contained in the original report (Appendix I of the Final Environmental Impact Report [FEIR]) for the One Paseo Project remain applicable to the New One Paseo Project.

Background

The original report evaluated a development proposal consisting of 1,857,444 gross square feet (gsf) including residential, retail, office and hotel uses. For purposes of this Addendum, this development proposal is referred to the "Originally Proposed Project". Subsequent to the preparation of the original report, Kilroy redesigned the project to reduce the development to 1,454,069 gsf. The major changes included elimination of the hotel, reduction in square footage of residential, retail and office uses, and the addition of a green space. An analysis of this redesigned project was included in the EIR as the "Reduced Main Street Alternative" (also referred to as the "Approved Project").

Subsequent to the approval of the Approved Project, Kilroy has redesigned the development proposal to further reduce the total size of the project to 1,175,871 gsf. More information on the New One Paseo Project is included in the project description section of this Addendum.

Project Description

The New One Paseo Project retains the residential, retail and office uses, but eliminates the green space that was included in the Approved Project. The total number of residential units would remain 608. However, the square footage of retail and office uses would be reduced from both the Originally Proposed Project and the Approved Project. Table 1 and Figure 1 illustrate the land uses included in the New One Paseo Project.

Table 1. Land Uses

Land Use	Gross Square Footage	Number of Units
Office (Multi-tenant)	280,000	--
Retail	95,871	--
Residential	800,000	608
Total	**1,175,871**	**608**

A comparison of the land uses included in the New One Paseo Project with the Approved Project and the Originally Proposed Project is included in Table 2. With respect to the Originally Proposed Project, the New One Paseo Project would result in a 50 percent reduction in the amount of office space, and a 64 percent reduction in the amount of retail space. The number of residential units would remain unchanged. The hotel would be eliminated. The overall square footage would decrease by 37 percent from 1,857,440 to 1,175,871 gsf.

When compared with the Approved Project, the New One Paseo Project would reduce the office space by 43 percent. The retail component would be reduced by 61 percent. The green space would be eliminated. Overall the total square footage of the development would be reduced by 19 percent from 1,454,069 to 1,175,871 gsf. The number of residential units would remain unchanged.

Purpose

The purpose of this Water Quality Technical Report is to reanalyze the water quality design based upon the New One Paseo project. We will determine the sizing of proposed treatment and hydromodification systems and the adequacy of the project's Best Management Practices .

Since the time the original report was prepared, the City of San Diego has published a draft Storm Water Standards Manual for 2015, which the New One Paseo project is anticipated to be subject to This report is prepared in accordance with the guidelines contained in the City of San Diego Storm Water Standards (Draft) dated August 2015.

Project Location

The proposed project is located in the Carmel Valley area of the City of San Diego, which falls under the Miramar Reservoir Hydrologic Area (Hydrologic Sub-area 906.10) of the Peñasquitos Hydrologic unit. The project site is on the southwest corner of the intersection of El Camino Real and Del Mar Heights Road. just east of interstate 5, in the City of San Diego (see Exhibit A).

Project Description

Existing Site Condition

The project site located on the southwest corner of El Camino Real and Del Mar Heights Road on a previously mass graded 23.7 acre site (see Appendix XVIII) designated by APNs 304-070-49-00, 304-070-43-00, 304-070-52-00 & 304-070-57-00. The site is bound by Highbluff Drive to the west, Del Mar Heights Road to the North and El Camino Real to the East. All of the surrounding parcels are previously developed.

Proposed Site Condition

The project proposes a mixed use development with a total of 280,000 gross square feet of office, 95,871 gross square feet of retail and 800,000 gross square feet of residential (see Appendix V-Conceptual One Paseo site plan date September 22, 2015).

The project will have three "Points of Compliance", see Exhibit C-Drainage Management Area and BMP plan.

Pre & Post-Project Imperviousness:
The table below summarizes the Pre and Post-Project Imperviousness, peak mitigated flow, and unmitigated flow. See Exhibits B &D in the "Drainage Study for One Paseo" prepared by Leppert Engineering Corporation, dated October 16, 2015, for Pre and Post-Project Imperviousness Exhibits.

	Impervious		Pervious		Flow (cfs)	
	Area (sf)	%	Area (sf)	%	Mitigated	Unmitigated
Pre-Project	3,779	0.3	1,027,967	99.7	N/A	23.76
Approved Project	865,459	83.9	166,287	16.1	0.569	82.68
New-Project	802,139	77.7	229,607	22.3	2.48	71.31

Project Priority

In accordance with the Municipal Permit, each construction site with construction storm water Best Management Practice (BMP) requirements must be designated with a priority: high, medium, or low. As a permitted project on private property proposing; residential development of greater than 10 units, commercial development greater than one acre, restaurant, parking lot with greater than 15 spaces, street surface in excess of 5,000 sf, greater than 1 acre and tributary to an impaired water body for sediment, this project has been determined to have a "High Priority" project designation (see Appendix I).

Hydrologic Conditions

The approved project is located in the Carmel Valley area of the City of San Diego, which falls under the Miramar Reservoir Hydrologic Area (Hydrologic Sub-area 906.10) of the Peñasquitos Hydrologic unit. The project site is on the southwest corner of the intersection of El Camino Real and Del Mar Heights Road. just east of interstate 5, in the City of San Diego (see Exhibit A), per the Water Quality Control Plan for the San Diego Basin, San Diego Regional Water Quality Control Board, September 1994, henceforth referred to as the Basin Plan. See Exhibit B for a copy of the Basin Plan, which includes a table of the basin numbers.

The project site is located easterly of EL Camino Real, westerly of High Bluff Drive, and southerly Del Mar Heights Road, in the City of San Diego, situated within the Peñasquitos hydrologic unit. Storm water generated on-site will be collected by a private storm drain system that will empty into an existing storm drain system along the project's Eastern boundary (see Exhibit C).

Basin No. 906.10 is included in the most recent list of Clean Water Act Section 303(d) List of Water Quality Segments. The project site indirectly discharges to Los Peñasquitos Lagoon approximately 1.7 miles from the project site, which is impaired with Sedimentation/Siltation. Los Peñasquitos Lagoon discharges to Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Peñasquitos River mouth approximately 1.2 miles downstream, which is impaired for total coliforms. A 303(d) List of Water Quality Segments, specific to this project, is included as Appendix II.

ASBS Receiving Waters

There are no ASBS receiving waters downstream of the project location.

Pollutants of Concern

The following categories of anticipated or potential pollutants have been identified as "pollutants of concern" based on residential development of greater than 10 units, commercial development greater than one acre, restaurant, parking lot with greater than 15 spaces, street surface in excess of 5,000 sf (see Appendix III):

- sediments	- nutrients	- heavy metals
-organic compounds	- trash & debris	- oxygen demanding substances
- oil and grease	- bacteria and viruses	- pesticides

According to section 2.2.2.6 of The City of San Diego Storm Water Standards Manual 2015 (Draft), BMPs must meet “medium removal efficiency” for “the most significant pollutants of concern”. From section B.6.1 of the manual, “the most significant pollutants of concern” for a project are those land use type(s) proposed by the PDP and those that receiving waters are listed as impaired for.

Most Significant/Primary Pollutants	Secondary Pollutants	
Sediment	Nutrients	Oxygen demanding substances
Bacteria & viruses	Heavy metals	Oil & grease
	Organic Compounds	Pesticides
	Trash & debris	

Beneficial uses

Beneficial uses for all of the receiving waters are found below.

Los Peñasquitos Lagoon	Estuarine Habitat
Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Peñasquitos River mouth	Water Contact Recreation

Beneficial water uses within the Los Peñasquitos Watershed as designated in the State Water Resources Control Board's San Diego Region Basin Plan.

Benefical Uses	Inland Surface Water	Coastal Water	Reservoirs and Lakes	Ground Water
Municipal and Domestic Supply			X	X
Agricultural Supply	X			X
Industrial Service Supply	X	X	X	X
Navigation		X		
Contact Water Recreation	X	X	X	
Non-Contact Water Recreation	X	X	X	
Commercial and Sport Fishing		X		
Biological Habitats of Special Signif.		X		
Warm Freshwater Habitat	X		X	
Cold Freshwater Habitat	X		X	
Estuarine Habitat		X		
Wildlife Habitat	X	X	X	
Rare, Threatened, or End.	X	X		
Marine Habitat		X		
Migration of Aquatic Organisms		X		
Aquaculture		X		
Shellfish Harvesting		X		
Spawning, Reprod. and/ or Early Develop.		X		
Hydropower Generation			X	

Best Management Practices

The source control and LID BMP sections below are based upon the City of San Diego 2012 Storm Water Standards Manual, which is the most current manual available at this time. However in anticipation of expected changes to the manual based upon the updated stormwater permit, treatment control BMPs have been selected using the Model BMP Design Manual for the San Diego Region. This section will be revised based upon any changes required once the new San Diego Stormwater Standards Manual is available which is anticipated for December 2015.

A. Source Control BMPs

The following source control BMPs are incorporated into the site design, (See Exhibit C):

1. Maintenance Bays.
   - There are no maintenance bays proposed as part of this development.
2. Vehicle and Equipment Wash Areas.
   - There are no vehicle and equipment wash areas proposed as part of this development.
3. Outdoor Processing Areas.
   - Where applicable, all stockpiled materials will be covered to prevent storm water contact.
4. Retail and Non-Retail Fueling Areas.

- There are no fueling areas proposed as part of this development.

5. Steep Hillside Landscaping.
    - There are no steep hillsides areas being developed as part of this proposed development.
6. Use Efficient Irrigation Systems and Landscape Design.
    - The proposed development will utilize efficient design by proposing some or all of the below referenced systems:
        A. Rain Shutoff Devices
        B. Designing Irrigation Systems for individual area requirements
        C. Flow Reducers or Shutoff Valves to control water loss in the event of broken heads or lines.
7. Design Trash Storage Areas to Reduce Pollution Contribution.
    - The proposed development will utilize trash enclosures with impervious surface, utilize lids on all trash containers and provide a roof to minimize contact with storm water.
8. Design Outdoor Material Storage Areas to Reduce Pollution Contribution.
    - All material that will need to be stored on-site will be protected via enclosure. If the material is considered hazardous, a secondary containment structure such as berm, dike or curb will be constructed to prevent leaks and spills in the event the enclosure fails.
9. Design Loading Docks to Reduce Pollution Contribution.
    - Loading docks will be covered and equipped with cutoff devices in the event of spills.
10. Employ Integrated Pest Management Principles.
    - Biological Control: Educational material will be distributed to all new residents regarding relying on natural enemies to eat pests.
    - Habitat Manipulation: Educational material will be distributed to all new residents regarding physical pest elimination techniques, such as weeding, squashing, trapping, washing or pruning out pests.
    - Use of Resistant Plant Varieties: The proposed development will utilize and educational material will be distributed to all new residents regarding use of non-invasive resistant plant varieties.
    - Proper Use of Pesticides as a last line of defense: Educational material will be distributed to all new residents.
11. Provide Storm Water conveyance System Stamping and Signage.
    - Stamping or equivalent will be provided at all on-site storm drain inlet openings.
12. Manage Fire Sprinkler System Discharges.
    - The proposed development will incorporate fire sprinklers that will discharge into the sanitary sewer during routine maintenance.
13. Manage Air Conditioning Condensate.
    - The proposed development will direct condensate into landscaped areas where feasible.
14. Use Non-Toxic Roofing Materials Where Feasible.
    - The proposed development will avoid using toxic roofing materials where feasible.
15. Other Source Control Requirements.
    - The project will abide by all post-construction soil stabilization practices in conformance with the approved Grading and Landscaping Plans
    - The proposed development will provide trash receptacles in areas of high pedestrian traffic.

B. Low Impact Development (LID) BMPs

The following LID BMPs are incorporated into the site design: (See Exhibit C)

1. Optimize the Site Layout:
   - The proposed development utilizes the existing topography to minimize grading.
2. Minimize Impervious Footprint:
   - The proposed development proposes multi-story structures to increase building density.
   - The proposed development utilizes a shared driveway for access.
   - The proposed development utilizes indoor parking.
3. Disperse Runoff to Adjacent Landscaping and IMPs.
   - Where feasible, the proposed development will drain sidewalks, walkways, and patios into adjacent landscaping.
   - The proposed development utilizes depressed landscaping areas.
4. Design and Implementation of Pervious Surfaces.
   - Permeable surfaces will not be proposed due to the location of the landscaped areas in relation to the proposed structures.
5. Construction Considerations.
   - Soil Compaction of landscaped areas will not be proposed due to the location of the landscaped areas in relation to the proposed structures.
   - Soil Amendments are not proposed for this development due to the location of the landscaped areas in relation to the proposed structures.
6. Additional Considerations.
   - All disturbed soils, slopes and permanent channel crossings will be vegetated to stabilize the site per the approved Grading and Landscaping plans.
   - Runoff will be directed away from the top of slopes.

C. Treatment Control BMPs

BMP Selection:

1. Infiltration Basin – Due to existing soil type and subterranean parking structure the use of infiltration basins is not suitable for the proposed project.

2. Bio-retention Basin – Due to existing soil type as well as building density the use of bio-retention basins is not suitable for the proposed project. Proprietary Biofiltration BMPs (City of San Diego Draft Storm Water standards manual; BF-3) will be used in lieu of bio-retention basins for the proposed project.

3. Cistern Plus Bio-retention – Due to existing soil type the use of cistern bio-retention basins is not suitable for the proposed project.

4. Vault Plus Bio-retention - Due to existing soil type the use of vault plus bio-retention basins is not suitable for the proposed project.

5. Self-retaining Area –- Based on the project footprint and size constraints, self-retaining areas are not suitable for the proposed project.

6. Dry Wells - Based on the project’s ground water level, dry wells are not suitable for the proposed project.

7. Constructed Wetlands – Based on the project footprint and size constraints, constructed wetlands areas are not suitable for the proposed project.

8. Extended Detention Basin - Based on the project footprint and size constraints, an extended detention basin is not suitable for the proposed project.

9. Vegetated Swale – Proprietary Biofiltration (BF-3) will be utilized in lieu of a vegetated swale.

10. Vegetated Buffer Strip – Where feasible, vegetated buffer strips will be proposed along adjacent streets.

11. Flow Through Planter Boxes – Modular wetland systems will be proposed for treatment of storm water prior to storage and discharge.

    Modular Wetlands are not specifically listed on Table 4-3 of the current City Stormwater Design Manual, but they are most closely related to flow-through planter boxes, which have a medium or high efficiency rating for all pollutants of concern. Our proposed units will be located in vegetated areas and will be provided with a grate inlet as well as having piped flows plumbed into the treatment chamber.

    Manufacturer's details regarding the modular wetlands system are included in Appendix IV.

12. Vortex Separator or Wet Vault – Proprietary Biofiltration (BF-3) (BF-3) will be utilized in lieu of a vortex separator or wet vault

13. Media Filters – Proprietary Biofiltration (BF-3) (BF-3) will be utilized in lieu of media filters.

<u>Storm Water Pollutant Control</u>

Storm Water Pollutant Control BMP Selection was done using Figures 5-1 & 5-2 "Storm Water Pollutant Control BMP Selection Flow Chart" from the County of San Diego Model BMP Design Manual San Diego Region, dated June 2015, see Appendix XV. Below is a summary of each step in the flow chart:

Step 1: Evaluate at DMA Scale
- There are 3 DMAs onsite to account for, see Exhibit B.

Step 1A: Is the DMA "Self-mitigating" or "De Minimis" or "Self-retaining"
- DMAs are not "Self-mitigating" or "De Minimis" or "Self-retaining"
    - Proceed to Step 1B.

Step 1B: Adjust runoff factor to account for site design BMPs and estimate DCV
- DCV calculation performed using Worksheet B.2-1 from the San Diego County Model BMP Manual, see Appendix XVI.

Step 2: Is Harvest and Use Feasible
- No, Harvest and Use is not feasible, see calculations in Appendix XVII, based on Worksheet B.3-1 from the San Diego County Model BMP Manual.

Step 3: Step 3: Is Infiltration Feasible?
- No infiltration is feasible because property is in C & D soil.

Step 3 A&B: No Infiltration Condition
- Proceed to Step 3C

Step 3C: Compute Sizing Requirement
- Proprietary Biofiltration (BF-3) are selected BMP
- Sizing performed using section F.6.2 Sizing of Flow Based Biofiltration BMP.

Step 4: Can the BMP be designed for the remaining DCV?
- Yes, the site design can incorporate HMP storage facilities sized with the County of San Diego "BMP Sizing Spreadsheet V1.04" from the Project Clean Water Website - http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=137&Itemid=138, see Appendix XIV.

Step 4A:
- The biofiltration facilities have been sized to required flow.

Step 6 & 7: The project is "Compliant with Pollutant Control BMP Sizing Requirements".

Numeric Sizing Treatment Standards

For this project, proprietary biofiltration BMPs have been selected as outlined in the City of San Diego Storm Water Standards (Draft) dated August 2015. The numeric sizing of the flow based BMPs was determined utilizing the runoff produced from a rainfall intensity of 0.2 in/hr X 1.5 for sites where infiltration is not feasible as outlined in the City of San Diego Storm Water Standards Manual 2015 (Draft) section F.6.2, which produces a flow based sizing intensity of 0.3 in/hr. Details of the proposed treatment controls and Washington State D.O.E. certification for General Use Level Designation (GULD), as is required for use of proprietary biofiltration BMPs, are included with this report in Appendix IV.

The treatment flow runoff calculations are tabulated below utilizing the Q=C*0.3*A.

PROPOSED TREATMENT CALCULATIONS

BASIN	AREA (ac)	C FACTOR	I (in/hr)	Required Q (cfs)	Provided Q (cfs)	Soil Type	BMP Type	Model
DMA-01	14.68	0.95	0.3	4.18	4.851	"D"	Modular Wetland	(7) MWS-L-10-20
DMA-02	1.60	0.95	0.3	0.45	0.462	"D"	Modular Wetland	MWS-L-8-16
DMA-03	4.47	0.95	0.3	1.27	1.386	"D"	Modular Wetland	(2) MWS-L-10-20
DMA-04	5.18	0.95	0.3	1.48	1.731	"D"	Modular Wetland	(3) MWS-L-8-20
DMA-05	0.39	0.95	0.3	0.11	0.115	"D"	Modular Wetland	MWS-L-4-8
DMA-06	0.62	0.95	0.3	0.18	0.206	"D"	Modular Wetland	MWS-L-4-17
DMA-07	1.39	0.95	0.3	0.39	0.462	"D"	Modular Wetland	MWS-L-8-16

Total	**8.069**	**9.213**

DMA-1, 3 & 4: These DMAs consists of the entirety of the project site and the west portion of the drainage within Del Mar Heights Road being routed to the private storm drain system. The runoff produced in these DMAs will be treated utilizing multiple private Modular Wetlands system units in parallel to meet the full treatment flow required as calculated above.

DMA-2, 5-7: These DMAs consists of the east half of Del Mar Heights Road and The entire frontage along El Camino Real being captured by the public storm drain system. The runoff produced in these DMAs will be treated utilizing individual public Modular Wetlands system units at each inlet the DMA drains to meet the full treatment flow required as calculated above.

Hydromodification Management

Hydromodification controls are required to be implemented for the proposed project in accordance with the HMP Decision Matrix from the City of San Diego Storm Water Standards 2015 (Draft)(see Appendix VI-Figure 1-2 - HMP Applicability Determination).Runoff storage will be accomplished utilizing Stormtrap units (see Appendix XIX)

A downstream SCCWRP analysis was done by Chang Consultants for "The Heights" which is the site to the south directly adjacent to the project site. The analysis evaluated the channel susceptibility; and the result was a "low". Since this project is immediately upstream of The Heights, the channel susceptibility will be the same. All of the calculations for hydromodification were done using the allowed $.5Q_2$ as the flow control required.

DMA-1, 3 & 4: These DMAs consists of the entirety of the project site and the west portion of the drainage within Del Mar Heights Road being routed to the private storm drain system. The runoff produced in these DMAs will be stored in a cistern and discharged via orifice to the storm drain system. The individual points of compliance (POC) for each DMA have been sized for the required cistern sizing based on the project pervious and impervious totals

DMA-2, 5-7: These DMAs consists of the east half of Del Mar Heights Road and The entire frontage along El Camino Real being captured by the public storm drain system. The runoff produced due to the increased imperviousness for widening along these streets has been accounted for in the sizing of the cisterns for the onsite DMAs so no further hydromodification is required

Buffer Measures

Buffer areas are not proposed as part of this project as we are not in close proximity to any water quality sensitive areas and/or the 100-year flood plain.

Maintenance Conditions

The permitee or designee shall execute a Storm Water Management and Discharge Control Maintenance Agreement for ongoing permanent BMP maintenance, satisfactory to the City Engineer, prior to the issuance of any construction permits (see Appendix VII). The property owner will be responsible for all maintenance of the onsite storm water treatment and flow control devices.

Operation and Maintenance Procedures

Modular Wetland System (see Appendix IV):

- Clean Bio Clean® Catch Basin Filter – average maintenance interval is 3 to 6 months (15 minute service time).
- Clean Separation (sediment) Chamber – average maintenance interval is 6 to 18 months (30 minute service time).
- Replace Cartridge Filter Media (BioMediaGREEN™) – average maintenance interval 6 – 12 months (45 minute service time).
- Replace Drain Down Filter Media (BioMediaGREEN™) – average maintenance interval is 6 to 12 months (5 minute service time).
- Trim Vegetation – average maintenance interval is 3 to 6 months (15 minute service time).
- Evaluate Wetland Media Flow Hydraulic Conductivity – average inspection interval is once per year (5 minute inspection time).
- Wetland Media Replacement – average maintenance interval is 5 to 20 years (6 hours).

A Storm Water Management and Discharge Control Maintenance Agreement (see Appendix VII) will be executed as part of the final approval of the proposed project.

Permanent Storm Water BMP Certification

Per a Notice from the City of San Diego Development Services Department, from the Deputy City Engineer, dated January 23, 2013, a licensed Civil Engineer must certify that any permanent storm water Best Management Practices (BMP) required pursuant to a Construction Permit were installed and functioning in accordance with the approved plans and all applicable specifications, permits, ordinances, and the applicable Storm Water Municipal Permit issued by the San Diego Regional Water Quality Control Board. The Permanent BMP Construction Self Certification Form (DS-563) is included as Appendix VIII.

Drainage Study

The Storm Water Standards section of the City of San Diego Land Development Manual requires that a drainage study be prepared to evaluate the runoff characteristics for 2 year and 10 year frequency storms, of 6 hour or 24 hour duration, for the coastal areas of San Diego County, as described in the San Diego County Hydrology Manual.

This study calculates the total runoff from the site using the guidelines set forth in the City of San Diego's Drainage Design Manual, dated April 1984 (see Appendix IX). The specific method used is the Rational Formula for watersheds under 0.5 square miles.

Autodesk Storm and Sanitary Analysis was used for the 2 and 10 year frequency storm analysis. Autodesk Storm and Sanitary Analysis is a link-node based model that performs hydrology, hydraulic, and water quality analysis of storm water and wastewater drainage systems, including sewage treatment plants and water quality control devices. A link represents a hydraulic element (i.e., a pipe, channel, pump, standpipe, culvert, or weir) that transports flow and constituents. A node can represent the junction of two or more links, a storm drain catch basin inlet, the location of a flow or pollutant input into the system, or a storage element (such as a detention pond, retention pond, settling pond, or lake).

Drainage basin boundaries, flow patterns, and topographic elevations are shown on the drainage basin maps located in the map pockets of the "Drainage Study for One Paseo" prepared by Leppert Engineering Corporation, dated October 16, 2015.

Existing Runoff Condition
The existing condition analysis analyzes eight Subbasins as shown on "Existing Condition Drainage Basin Map" (see Exhibit B from "Drainage Study for One Paseo" prepared by Leppert Engineering Corporation, dated October 16, 2015).

The results of the analysis are included as Appendix XII - 2 and 10-year Storm Event SSA Analysis Results.

The runoff at Out-01 was calculated for each storm event as follows:

- 2 year = 12.37 cfs
- 10 year = 18.08 cfs

Proposed Runoff Condition
The proposed condition analysis analyzes 51 basins as shown "Proposed Condition Drainage Basin Map" (see Exhibit D from "Drainage Study for One Paseo" prepared by Leppert Engineering Corporation, dated October 16, 2015).

Results from the analysis can be found in Appendix XII - 2 and 10-year Storm Event SSA Analysis Results.

The runoff at Out-01 was calculated for each storm event as follows:

- 2 year = 39.49 cfs
- 10 year = 56.04 cfs

The results of the analysis are included as Appendix XII -2 and 10-year Storm Event SSA Analysis Results.

Conclusion
As compared to the previous approval, the New One Paseo project increases treated flow from the site. The total private treatment flow required for the site is 6.93 cfs vs the previous 4.72 cfs, an increase of 2.21 cfs from the previous approval. The total required public treatment flow for the site is 1.14 cfs vs the previous 0.80 cfs, an increase of 0.34 from the previous approval.

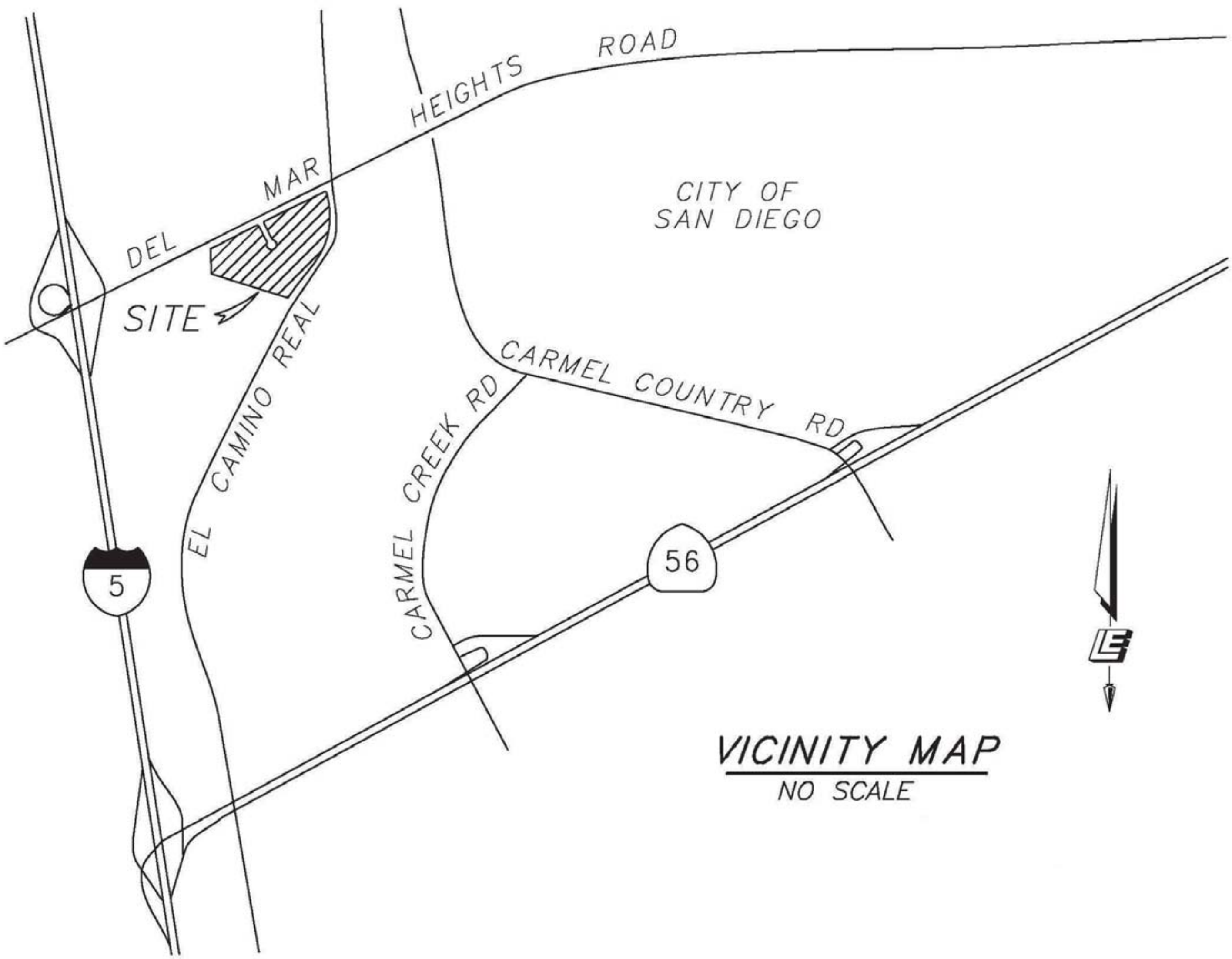
The New One Paseo results in a reduction in overall site impervious areas. This will create a decrease in pollutant loads and peak flows from the site due to the increased incidental infiltration and evapotranspiration of the landscaped areas. The Modular Wetlands System, as a proprietary biofiltration treatment, also has medium or higher pollutant removal efficiency for all pollutants. The Jellyfish and Ecostorm Plus units previously proposed are "media filters", which per the City of San Diego Storm Water Standards 2012 have lower removal efficiencies for some pollutants. The increased treatment flow is due to the implementation of the updated City of San Diego Storm Water Standards

Manual 2015 (Draft). These factors will all function to increase the water quality of the runoff being discharged from the site.

As discussed above, we conclude that the New One Paseo Project would not result in any new impacts related to Water Quality. Nor, would the New One Paseo Project result in an increase severity in the drainage impacts identified in our original report.

EXHIBIT "A" – Location Map

EXHIBIT "A"



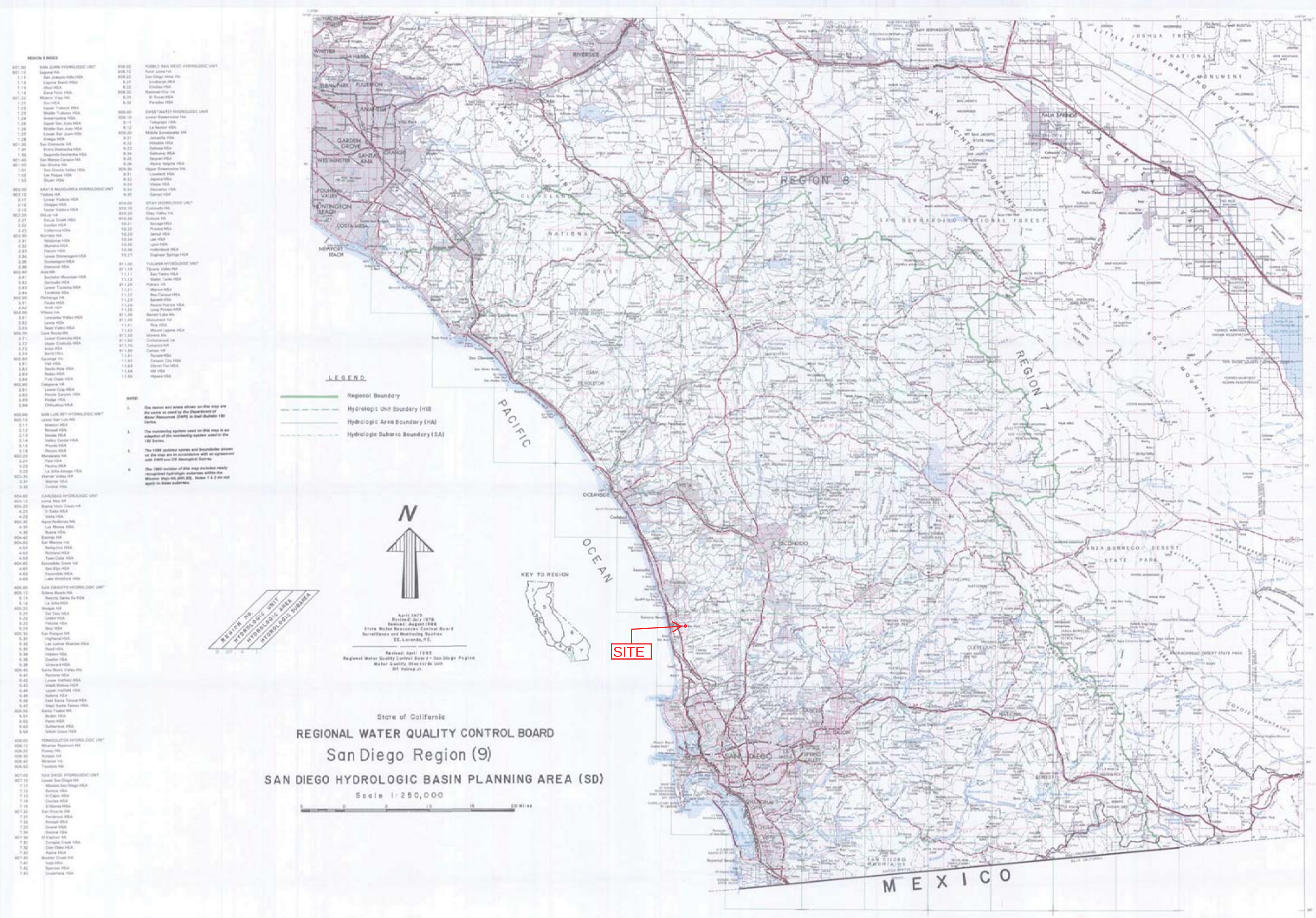
VICINITY MAP
NO SCALE

LEGAL DESCRIPTION:

PARCELS 1 AND 2 OF PARCEL MAP 15061 RECORDED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY ON DECEMBER 16, 1987 AND PARCEL 2 OF PARCEL MAP 19130, RECORDED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY ON DECEMBER 20, 2002, ALL LOCATED IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA.

LOCATION MAP
NO SCALE

EXHIBIT “B” – San Diego Hydrologic Basin Planning Area Map



State of California
REGIONAL WATER QUALITY CONTROL BOARD
San Diego Region (9)
SAN DIEGO HYDROLOGIC BASIN PLANNING AREA (SD)
Scale 1:250,000
LEGEND
Regional Boundary
Hydrologic Unit Boundary (HU)
Hydrologic Area Boundary (HA)
Hydrologic Subarea Boundary (SA)
KEY TO REGION
REGION NO.
HYDROLOGIC UNIT
HYDROLOGIC AREA
HYDROLOGIC SUBAREA
N
PACIFIC
OCEAN
MEXICO
REGION 8
REGION 7
SAN JACINTO MOUNTAINS
SANTA ROSA MOUNTAINS
ANZA BORREGO DESERT STATE PARK
RIVERSIDE
ANAHEIM
FULLERTON
GARDEN GROVE
SANTA ANA
WESTMINSTER
HUNTINGTON BEACH
FOUNTAIN VALLEY
COSTA MESA
NEWPORT BEACH
OCEANSIDE
ESCONDIDO
SAN DIEGO
EL CAJON
PALM SPRINGS
SITE

EXHIBIT "C" – Drainage Management Area & BMP Plan

BMP NOTES:

INTRODUCTION

RUNOFF CONVEYED AND DISCHARGED BY MUNICIPAL STORM WATER SYSTEMS HAS BEEN IDENTIFIED BY LOCAL, REGIONAL, AND NATIONAL RESEARCH PROGRAMS AS ONE OF THE PRINCIPAL CAUSES OF WATER QUALITY PROBLEMS IN URBAN AREAS SUCH AS THE CITY OF SAN DIEGO. THIS RUNOFF POTENTIALLY CONTAINS A HOST OF POLLUTANTS INCLUDING TRASH, DEBRIS, BACTERIA, VIRUSES, OIL, GREASE, SEDIMENTS, NUTRIENTS, METALS, AND TOXIC CHEMICALS. THESE CONTAMINANTS CAN ADVERSELY AFFECT THE BENEFICIAL USES OF RECEIVING CREEKS, COASTAL WATERS, ASSOCIATED WILDLIFE HABITAT, AND PUBLIC HEALTH. URBAN RUNOFF POLLUTION IS A PROBLEM DURING RAINY SEASONS AND ALSO
THROUGHOUT THE YEAR DUE TO URBAN WATER USES THAT DISCHARGE NON-STORM WATER RUNOFF VIA DRY WEATHER FLOWS TO THE STORM WATER CONVEYANCE SYSTEM.

THE MUNICIPAL STORM WATER NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM PERMIT (MUNICIPAL PERMIT), ISSUED ON JANUARY 24, 2007 TO THE CITY OF SAN DIEGO, REQUIRES THE DEVELOPMENT AND IMPLEMENTATION OF STORM WATER REGULATIONS ADDRESSING STORM WATER POLLUTION ISSUES IN DEVELOPMENT PLANNING AND CONSTRUCTION ASSOCIATED WITH PRIVATE AND PUBLIC DEVELOPMENT.

THE PURPOSE OF THIS PLAN, WITH RESPECT TO THE PROPOSED DEVELOPMENT, IS TO COMPLY WITH THE MUNICIPAL PERMIT, AND THE MODEL STANDARD URBAN STORM WATER MITIGATION PLAN (SUSMP) APPROVED BY THE REGIONAL BOARD ON MARCH 4, 2009 FOR THE IMPLEMENTATION OF PERMANENT AND CONSTRUCTION STORM WATER BMP REQUIREMENTS.

I. DETERMINATION OF STANDARD AND PRIORITY STORM WATER BMP REQUIREMENTS:

A) MATRIX TO DETERMINE IF PROJECT IS EXEMPT FROM PERMANENT STORM WATER BMP REQUIREMENTS:

DOES ANY OF THE FOLLOWING APPLY TO THE PROPOSED DEVELOPMENT.	YES	NO
1. THE PROJECT IS NOT A DEVELOPMENT PROJECT AS DEFINED BY THE STORM WATER STANDARDS MANUAL.		X
2. THE PROJECT IS ONLY THE CONSTRUCTION OF UNDERGROUND OR OVERHEAD LINEAR UTILITIES.		X
3. THE PROJECT QUALIFIES AS ROUTINE MAINTENANCE.		X
4. THE PROJECT ONLY INSTALLS SIDEWALKS, BIKE LANES, OR PEDESTRIAN RAMPS ON AND EXISTING ROAD, AND DOES NOT CHANGE DRAINAGE PATTERN.		X

B) MATRIX TO DETERMINE PRIORITY PROJECT PERMANENT STORM WATER BMP REQUIREMENTS:

DOES THE PROJECT MEET THE DEFINITION OF ONE OR MORE OF THE PRIORITY PROJECT CATEGORIES AS DEFINED IN THE STORM WATER STANDARDS?	YES	NO
1. RESIDENTIAL DEVELOPMENT OF 10 OR MORE UNITS.	X	
2. COMMERCIAL DEVELOPMENT AND SIMILIAR NON-RESIDENTIAL DEVELOPMENTS > 1 ACRE.	X	
3. HEAVY INDUSTRIAL DEVELOPMENT > 1 ACRE.		X
4. AUTOMOTIVE REPAIR SHOP.		X
5. RESTAURANT.	X	
6. HILLSIDE DEVELOPMENT GREATER THAN 5,000 SQUARE FEET.		X
7. PROJECT WITHIN, DIRECTLY ADJACENT TO OR DISCHARGING TO RECEIVING WATERS WITHIN WATER QUALITY SENSITIVE AREAS.		X
8. PARKING LOT GREATER THAN OR EQUAL TO 5,000 SQ. FT. WITH AT LEAST 15 PARKING SPACES AND POTENTIALLY EXPOSED TO URBAN RUNOFF.	X	
9. STREETS, ROADS, HIGHWAYS, AND FREEWAYS THAT WOULD CREATE A NEW PAVED SURFACE THAT IS 5,000 SQ. FT. OR GREATER.	X	
10. RETAIL GASOLINE OUTLETS.		X
11. SIGNIFICANT REDEVELOPMENT.		X
12. OTHER POLLUTANT GENERATING PROJECT.		X

C) DETERMINE WHETHER PROJECT IS EXEMPT, STANDARD OR A PRIORITY DESIGNATION:

1. IF "YES" IS CHECKED FOR ANY LINE IN PART A, THEN CHECK THIS BOX: ☐ EXEMPT PROJECT
2. IF "NO" IS CHECKED FOR ALL LINES IN PART A AND PART B, THEN CHECK THIS BOX: ☐ STANDARD DEVELOPMENT PROJECT
3. IF "NO" IS CHECKED FOR ALL LINES IN PART A, AND "YES" IS CHECKED FOR AT LEAST ONE OF THE ITEMS IN PART B, THEN CHECK THIS BOX: ☒ PRIORITY DEVELOPMENT PROJECT

II. DETERMINATION OF CONSTRUCTION STORM WATER BMP REQUIREMENTS:

D) DETERMINATION OF CONSTRUCTION PHASE STORM WATER REQUIREMENT:

WOULD THE PROJECT MEET ANY OF THESE CRITERIA DURING CONSTRUCTION?	YES	NO
1. IS THE PROJECT SUBJECT TO CALIFORNIA'S STATEWIDE GENERAL NPDES PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES?	X	
2. DOES THE PROJECT PROPOSE GRADING OR SOIL DISTURBANCE?	X	
3. WOULD STORM WATER OR URBAN RUNOFF HAVE THE POTENTIAL TO CONTACT ANY PORTION OF THE CONSTRUCTION AREA, INCLUDING WASHING AND STAGING AREAS?	X	
4. WOULD THE PROJECT USE ANY CONSTRUCTION MATERIALS THAT COULD NEGATIVELY AFFECT WATER QUALITY IF DISCHARGED FROM THE SITE (SUCH AS, PAINTS, SOLVENTS, CONCRETE, AND STUCCO)?	X	

5. CHECK THIS BOX IF "YES" IS CHECKED FOR LINE 1 ABOVE. ☒ SWPPP REQUIRED
6. CHECK THIS BOX IF "NO" IS CHECKED FOR LINE 1, AND "YES" IS CHECKED FOR ANY LINE 2-4: ☐ WPCP REQUIRED
7. CHECK THIS BOX IF "NO" IS CHECKED FOR ALL LINES 1-4: ☐ NO DOCUMENT REQUIRED

E) DETERMINATION OF CONSTRUCTION SITE PRIORITY:

☒ 1. HIGH PRIORITY

A) PROJECTS WHERE THE SITE IS 50 ACRES OR MORE AND GRADING WILL OCCUR DURING THE WET SEASON.

B) PROJECTS 1 ACRE OR MORE AND TRIBUTARY TO AN IMPAIRED WATER BODY FOR SEDIMENT (e.g. PENASQUITOS WATERSHED).

C) PROJECTS 1 ACRE OR MORE WITHIN OR DIRECTLY ADJACENT TO OR DISCHARGING DIRECTLY TO A COASTAL LAGOON OR OTHER RECEIVING WATER WITHIN A WATER QUALITY SENSITIVE AREA.

D) PROJECTS SUBJECT TO PHASED GRADING OR ADVANCED TREATMENT REQUIREMENTS.

☐ 2. MEDIUM PRIORITY

1) PROJECTS 1 ACRE OR MORE BUT NOT SUBJECT TO HIGH PRIORITY DESIGNATION.

☐ 3. LOW PRIORITY

1) PROJECTS REQUIRING A WATER POLLUTION CONTROL PLAN BUT NOT SUBJECT TO A MEDIUM OR HIGH PRIORITY DESIGNATION.

III. IDENTIFICATION OF POLLUTANTS

A) PROJECT CATEGORY: ATTACHED RESIDENTIAL DEVELOPMENT, COMMERCIAL, RESTAURANT,

1) POLLUTANTS OF CONCERN:

a. SEDIMENTS
b. NUTRIENTS
c. TRASH & DEBRIS
d. OXYGEN DEMANDING SUBSTANCES
e. OIL AND GREASE
f. BACTERIA & VIRUSES
g. PESTICIDES

IV. STANDARD/PRIORITY PERMANENT BEST MANAGEMENT PRACTICES (BMP'S)

LOW IMPACT DESIGN (LID) BMP'S:

1 MINIMIZE IMPERVIOUS FOOTPRINT THROUGH EFFICIENT DESIGN, INCORPORATING MULTI-LEVEL RESIDENTIAL BUILDINGS AND INDOOR PARKING.

2 SHARED DRIVEWAY.

3 DRAIN SIDEWALKS TO ADJACENT LANDSCAPING

SOURCE CONTROL BMP'S:

4 PROVIDE RAIN SHUTOFF DEVICES AND PRESSURE DROP FLOW REDUCERS/SHUTOFF VALVES.

5 DESIGN TRASH STORAGE AREAS TO REDUCE POLLUTION CONTRIBUTION.

6 USE OF PEST RESISTANT AND DROUGHT TOLERANT LANDSCAPING.

7 STENCIL OR STAMP ALL STORM DRAIN INLETS WITH WARNINGS TO DISCOURAGE "ILLEGAL" DUMPING OR DISCHARGE INTO THE STORM DRAIN SYSTEM.

TREATMENT CONTROL BMP'S:

8 USE OF PROPRIETARY BIOFILTRATION BMP BY BIOCLEAN ENVIRONMENTAL; MODULAR WETLAND SYSTEM TO FILTER RUNOFF.

V. CONSTRUCTION STORM WATER BMP PERFORMANCE STANDARDS

A) A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) WILL BE REQUIRED PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMITS FOR THE PROJECT.

B) THE PERMITEE OR DESIGNEE SHALL INCORPORATE ANY CONSTRUCTION BEST MANAGEMENT PRACTICES (BMP'S) NECESSARY TO COMPLY WITH CHAPTER 14, ARTICLE 2, DIVISION 1 (GRADING REGULATIONS) OF THE LAND DEVELOPMENT CODE, INTO THE CONSTRUCTION PLANS AND/OR SPECIFICATIONS, SATISFACTORY TO THE CITY ENGINEER, PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMITS.

VI. IMPLEMENTATION AND MAINTENANCE REQUIREMENTS

A) THE PERMITEE OR DESIGNEE SHALL EXECUTE A MAINTENANCE AGREEMENT FOR ONGOING PERMANENT BMP MAINTENANCE, SATISFACTORY TO THE CITY ENGINEER, PRIOR TO THE ISSUANCE OF ANY CONSTRUCTION PERMITS FOR THE PROJECT.

LEGAL DESCRIPTION

PARCELS 1 AND 2 OF PARCEL MAP 15061 RECORDED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY ON DECEMBER 16, 1987 AND PARCEL 2 OF PARCEL MAP 19130, RECORDED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY ON DECEMBER 20, 2002, ALL LOCATED IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA.

ASSESSOR'S PARCEL NUMBER:

304-070-49-00, 304-070-43-00, 304-070-52-00 & 304-070-57-00

LEGAL DESCRIPTION

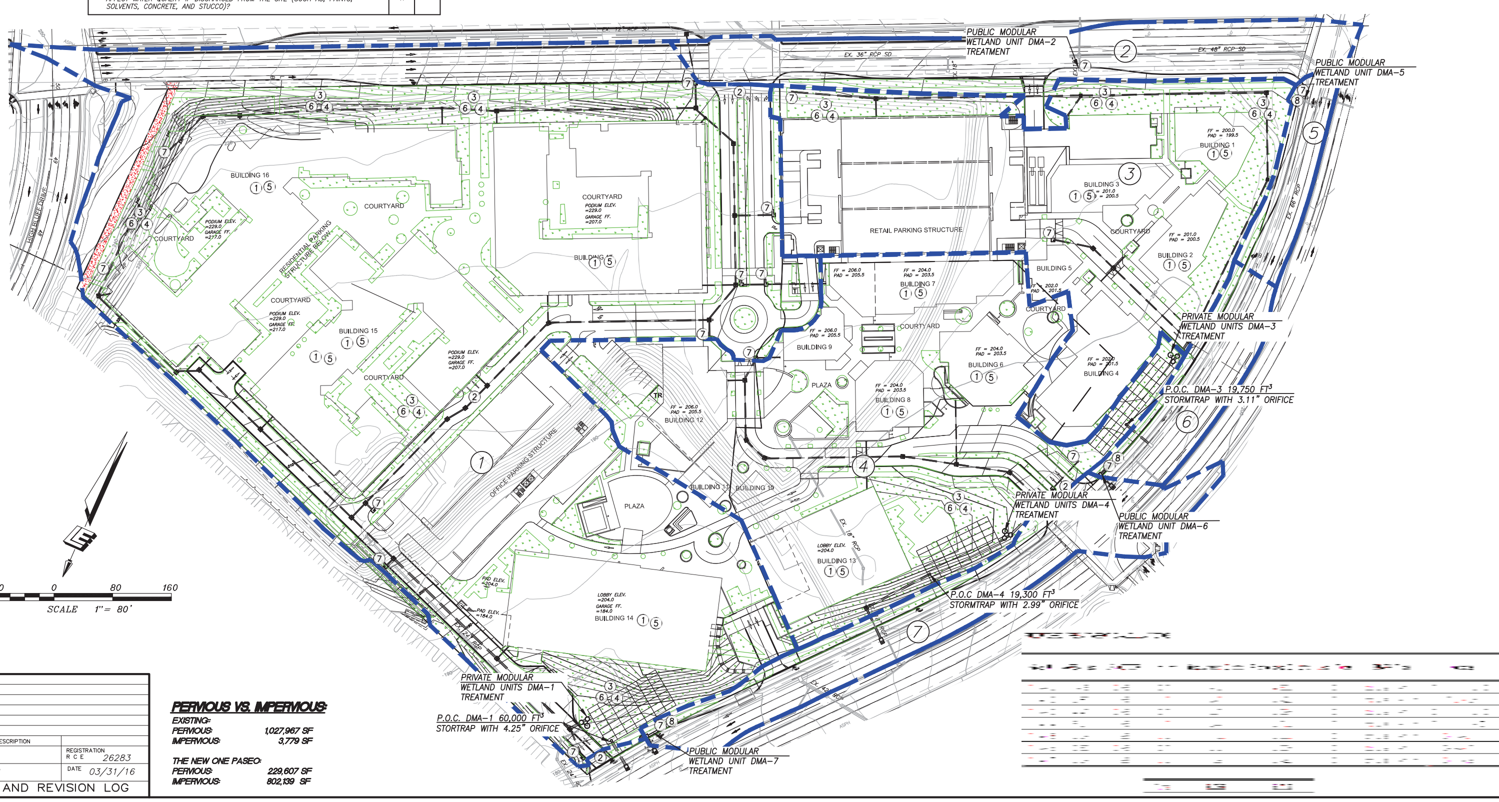
PORTIONS OF THE NORTH HALF OF THE SOUTHEAST QUARTER, PORTIONS OF THE SOUTHWEST QUARTER OF THE NORTHEAST QUARTER AND A PORTION OF THE EAST HALF OF THE SOUTHWEST QUARTER OF SECTION 30, TOWNSHIP 18 SOUTH, RANGE 1 WEST, SAN BERNARDINO BASE AND MERIDIAN, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO OFFICIAL PLAT THEREOF OF SAID LAND FILED IN THE DISTRICT LAND OFFICE DECEMBER 28, 1879.

ASSESSOR'S PARCEL NUMBER:

645-040-66-00 & 645-040-70-00

LEGEND

SUBDIVISION BOUNDARY
DMA LIMITS
PROPOSED STORM DRAIN
EXISTING STORM DRAIN
BMP DESIGNATION 9
PERVIOUS
EXISTING IMPERVIOUS



80 0 80 160
SCALE 1"= 80'

NO.	DATE	BY	DESCRIPTION	NO.	DATE	BY	DESCRIPTION
6				12			
5				11			
4				10			
3				9			
2				8			
1	10/16/15	MFD	ORIGINAL	7			

Leppert Engineering CORPORATION
5190 GOVERNOR DRIVE
Suite 205
San Diego, CA 92122
(858) 597-2001

APPROVED BY ENGINEER OF WORK
REGISTRATION R C E 26283
FILE CODE NCW 14.01-09.08
DATE 03/31/16
PREPARATION AND REVISION LOG

PERVIOUS VS. IMPERVIOUS:

EXISTING:
PERVIOUS: 1,027,967 SF
IMPERVIOUS: 3,779 SF

THE NEW ONE PASEO:
PERVIOUS: 229,607 SF
IMPERVIOUS: 802,139 SF

ONE PASEO
BMP PLAN

APPENDIX I – Stormwater Requirements Applicability Checklist

THE CITY OF SAN DIEGO

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
JANUARY 2011

Project Address: Southwest Corner of Del Mar Heights Road & El Camino Real	Project Number *(for City Use Only)*:

SECTION 1. Permanent Storm Water BMP Requirements:
Additional information for determining the requirements is found in the Storm Water Standards Manual.

Part A: Determine if Exempt from Permanent Storm Water BMP Requirements.
Projects that are considered maintenance, or are otherwise not categorized as "development projects" or "redevelopment projects" according to the Storm Water Standards manual are not required to install permanent storm water BMPs.
If "Yes" is checked for any line in Part A, proceed to Part C and check the box labeled "Exempt Project." If "No" is checked for all of the lines, continue to Part B.

1.	The project is not a Development Project as defined in the Storm Water Standards Manual: for example habitat restoration projects, and construction inside an existing building.	☐ Yes ☑ No
2.	The project is only the construction of underground or overhead linear utilities.	☐ Yes ☑ No
3.	The project qualifies as routine maintenance (replaces or renews existing surface materials because of failed or deteriorating condition). This includes roof replacement, pavement spot repairs and resurfacing treatments such as asphalt overlay or slurry seal, and replacement of damaged pavement.	☐ Yes ☑ No
4.	The project only installs sidewalks, bike lanes, or pedestrian ramps on an existing road, and does not change sheet flow condition to a concentrated flow condition.	☐ Yes ☑ No

Part B: Determine if Subject to Priority Development Project Requirements.
Projects that match one of the definitions below are subject to additional requirements including preparation of a Water Quality Technical Report.
If "Yes" is checked for any line in Part B, proceed to Part C and check the box labeled "Priority Development Project." If "No" is checked for all of the lines, continue to Part C and check the box labeled "Standard Development Project."

1.	**Residential development of 10 or more units.**	☑ Yes ☐ No
2.	**Commercial development and similar non-residential development greater than one acre.** Hospitals; laboratories and other medical facilities; educational institutions; recreational facilities; municipal facilities; commercial nurseries; multi-apartment buildings; car wash facilities; mini-malls and other business complexes; shopping malls; hotels; office buildings; public warehouses; automotive dealerships; and other light industrial facilities.	☑ Yes ☐ No
3.	**Heavy industrial development greater than one acre.** Manufacturing plants, food processing plants, metal working facilities, printing plants, and fleet storage areas.	☐ Yes ☑ No
4.	**Automotive repair shop.** Facilities categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539.	☐ Yes ☑ No
5.	**Restaurant.** Facilities that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), and where the land area for development is greater than 5,000 square feet.	☑ Yes ☐ No
6.	**Hillside development greater than 5,000 square feet.** Development that creates 5,000 square feet of impervious surface and is located in an area with known erosive soil conditions and where the development will grade on any natural slope that is twenty-five percent or greater.	☐ Yes ☑ No
7.	**Water Quality Sensitive Area.** Development located within, directly adjacent to, or discharging directly to a Water Quality Sensitive Area (as depicted in Appendix C) in which the project either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition. "Directly adjacent" is defined as being situated within 200 feet of the Water Quality Sensitive Area. "Discharging directly to" is defined as outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.	☐ Yes ☑ No
8.	**Parking lot with a minimum area of 5,000 square feet or a minimum of 15 parking spaces** and potential exposure to urban runoff (unless it meets the exclusion for parking lot reconfiguration on line 11).	☑ Yes ☐ No

9. **Street, road, highway, or freeway.** New paved surface in excess of 5,000 square feet used for the transportation of automobiles, trucks, motorcycles, and other vehicles (unless it meets the exclusion for road reconfiguration on line 11). ☑ Yes ☐ No

10. **Retail Gasoline Outlet (RGO)** that is: (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

11. **Significant Redevelopment**; project installs and/or replaces 5,000 square feet or more of impervious surface and the existing site meets at least one of the categories above. The project is not considered Significant Redevelopment if reconfiguring an existing road or parking lot without a change to the footprint of an existing developed road or parking lot. The existing footprint is defined as the outside curb or the outside edge of pavement when there is no curb. ☑ Yes ☐ No

12. **Other Pollutant Generating Project.** Any other project not covered in the categories above, that disturbs one acre or more and is not excluded by the criteria below. ☐ Yes ☑ No

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 or if they sheet flow to surrounding pervious surfaces.

Part C: Select the appropriate category based on the outcome of Parts A & B.

1.	If "Yes" is checked for any line in Part A, then check this box. Continue to Section 2.	☐ Exempt Project
2.	If "No" is checked for all lines in Part A, and Part B, then check this box. Continue to Section 2.	☐ Standard Development Project
3.	If "No" is checked for all lines in Part A, and "Yes" is checked for at least one of the lines in Part B, then check this box. Continue to Section 2. See the Storm Water Standards Manual for guidance on determining if Hydromodification Management Plan requirements apply.	☑ Priority Development Project

SECTION 2. Construction Storm Water BMP Requirements:
For all projects, complete Part D. If "Yes" is checked for any line in Part D, then continue to Part E.

Part D: 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? (See State Water Resources Control Board Order No. 2009-0009-DWQ for rules on enrollment)	☑ Yes ☐ No
2.	Does the project propose grading or soil disturbance?	☑ Yes ☐ No
3.	Would storm water or urban runoff have the potential to contact any portion of the construction area, including washing and staging areas?	☑ Yes ☐ No
4.	Would the project use any construction materials that could negatively affect water quality if discharged from the site (such as, paints, solvents, concrete, and stucco)?	☑ Yes ☐ No
5.	Check this box if "Yes" is checked for line 1. Continue to Part E.	☑ SWPPP Required
6.	Check this box if "No" is checked for line 1, and "Yes is checked for any line 2-4. Continue to Part E.	☐ WPCP Required
7.	Check this box if "No" is checked for all lines 1-4. Part E does not apply.	☐ No Document Required

Part E: Determine Construction Site Priority

This prioritization must be completed with this form, noted on the plans, and included in the SWPPP or WPCP. The City reserves the right to adjust the priority of the projects both before and during construction. [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.]

☑ 1. **High Priority**
- a) Projects where the site is 50 acres or more and grading will occur during the wet season
- b) Projects 1 acre or more and tributary to an impaired water body for sediment (e.g., Peñasquitos watershed)
- c) Projects 1 acre or more within or directly adjacent to or discharging directly to a coastal lagoon or other receiving water within a Water Quality Sensitive Area.
- d) Projects subject to phased grading or advanced treatment requirements.

☐ 2 **Medium Priority.** Projects 1 acre or more but not subject to a high priority designation.

☐ 3 **Low Priority.** Projects requiring a Water Pollution Control Plan but not subject to a medium or high priority designation.

Name of Owner or Agent *(Please Print):* Tony Dieli, Leppert Engineering Corporation	Title: Agent for Owner
Signature: Anthony M. Dieli	Date: 10/9/2015

APPENDIX II – 2012 California 303(d) List

WATER BODY NAME	WATER BODY TYPE	POLLUTANT	POLLUTANT CATEGORY	FINAL LISTING DECISION	DECISION STATUS**	TMDL REQUIREMENT STATUS***	EXPECTED TMDL COMPLETION DATE****
Los Penasquitos Lagoon	Estuary	Sedimentation/Siltation	Sediment	List on 303(d) list (TMDL required list)	Original	5A	2019
Pacific Ocean Shoreline, Miramar Reservoir HA, at Los Penasquitos River mouth	Coastal & Bay Shoreline	Total Coliform	Fecal Indicator Bacteria	List on 303(d) list (TMDL required list)	Original	5A	2019

APPENDIX III – Table B.6-1 –Anticipated and Potential Pollutants Generated by Land Use

Table B.6-1: Anticipated and Potential Pollutants Generated by Land Use Type

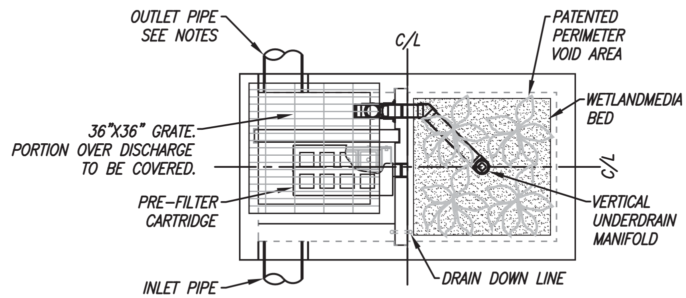
Priority Project Categories	General Pollutant Categories								
	Sediment	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P(1)	P(2)	P	X
Commercial Development >one acre	P(1)	P(1)	X	P(2)	X	P(5)	X	P(3)	P(5)
Heavy Industry	X		X	X	X	X	X		
Automotive Repair Shops			X	X(4)(5)	X		X		
Restaurants					X	X	X	X	P(1)
Hillside Development >5,000 ft2	X	X			X	X	X		X
Parking Lots	P(1)	P(1)	X		X	P(1)	X		P(1)
Retail Gasoline Outlets			X	X	X	X	X		
Streets, Highways & Freeways	X	P(1)	X	X(4)	X	P(5)	X	X	P(1)

X = anticipated
P = potential
(1) A potential pollutant if landscaping exists onsite.
(2) A potential pollutant if the project includes uncovered parking areas.
(3) A potential pollutant if land use involves food or animal waste products.
(4) Including petroleum hydrocarbons.
(5) Including solvents.

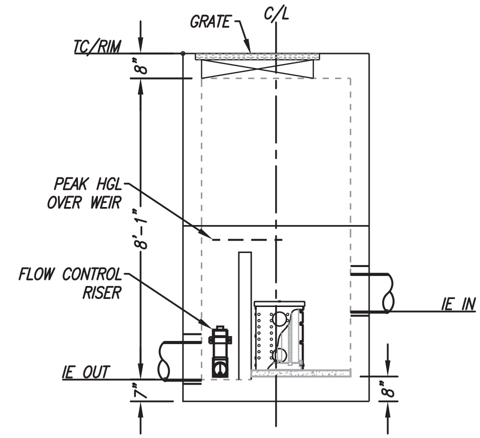
APPENDIX IV – Modular Wetlands System Information

SITE SPECIFIC DATA

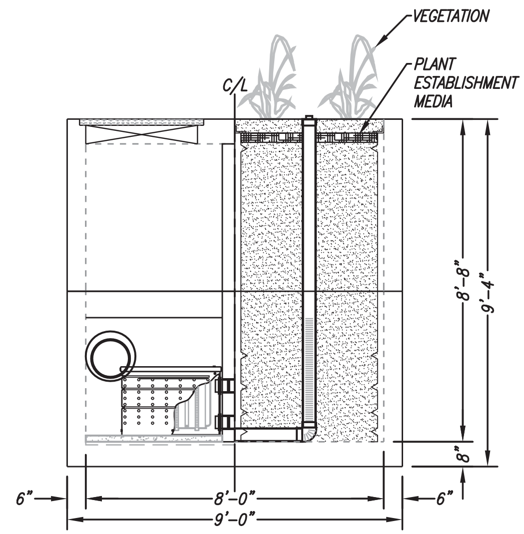
PROJECT NUMBER	3155		
PROJECT NAME	AMCAL 62ND ST		
PROJECT LOCATION	SAN DIEGO, CA		
STRUCTURE ID	M-2		
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
		0.11	
TREATMENT HGL AVAILABLE (FT)			3.30
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			2.05
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	194.17	PVC	12"
INLET PIPE 2			
OUTLET PIPE	192.34	PVC	12"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	201.1		
SURFACE LOAD	PARKWAY	OPEN PLANTER	PARKWAY
FRAME & COVER	36" x 36"	N/A	N/A
WETLANDMEDIA VOLUME (CY)			2.37
WETLANDMEDIA DELIVERY METHOD			TBD
ORIFICE SIZE (DIA. INCHES)			ø1.22"
MAXIMUM PICK WEIGHT (LBS)			TBD
NOTES:			



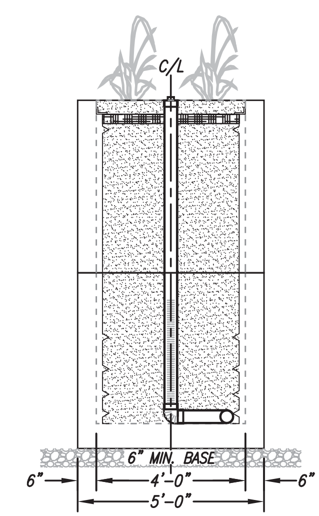
PLAN VIEW



LEFT END VIEW
PRETREATMENT/DISCHARGE



ELEVATION VIEW



RIGHT END VIEW
BIOFILTRATION

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURERS CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEERS RECOMMENDED BASE SPECIFICATIONS.
3. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL GAPS AROUND PIPES SHALL BE SEALED WATER TIGHT WITH A NON-SHRINK GROUT PER MANUFACTURERS STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. DRIP OR SPRAY IRRIGATION REQUIRED ON ALL UNITS WITH VEGETATION.

GENERAL NOTES

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

TREATMENT FLOW (CFS)	0.115
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	TBD
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

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MWS-L-4-8-G
STORMWATER BIOFILTRATION SYSTEM STANDARD DETAIL

10/12/15JUSTIN

SITE SPECIFIC DATA*

PROJECT NAME	
PROJECT LOCATION	
STRUCTURE ID	

PERFORMANCE DATA

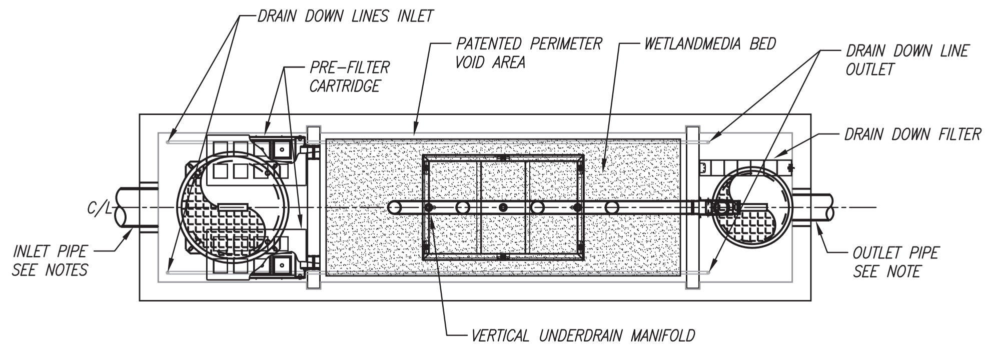
TREATMENT VOLUME (CF)	
TREATMENT HGL (FT)	3.4
BYPASS FLOW RATE (CFS)	DEPENDANT ON PIPE SIZE

PROJECT PARAMETERS

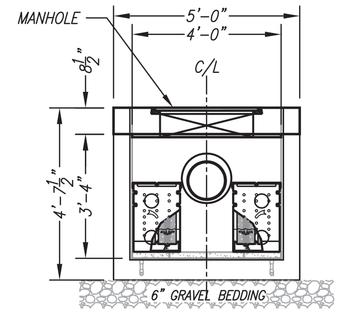
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
OUTLET PIPE 1			
RIM ELEVATION			
SURFACE LOADING REQUIREMENT			PARKWAY
FRAME & COVER	PRETREATMENT	BIOFILTRATION	DISCHARGE
	30	OPEN MEDIA	24
WETLANDMEDIA VOLUME (CY)			
MEDIA DELIVERED			
ORIFICE SIZE (DIA)			
MAX PICK WEIGHT (LBS)			

NOTES:

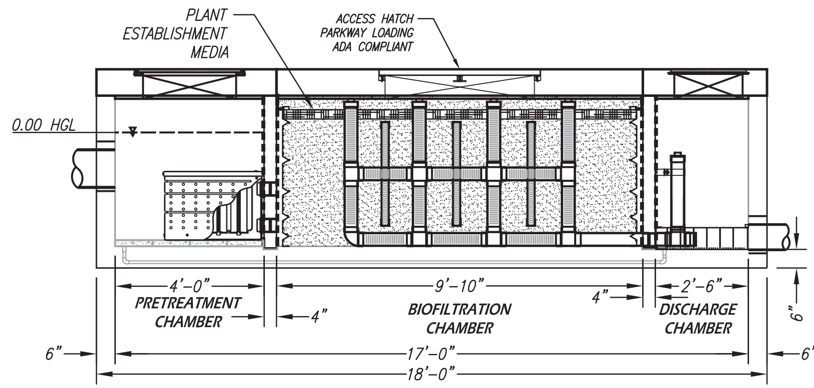
*PER ENGINEER OF RECORD



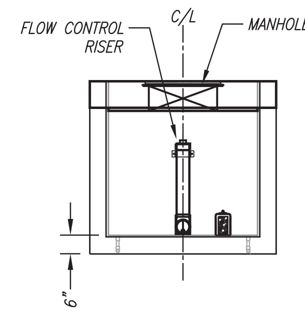
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

INSTALLATION NOTES

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MWS UNIT DESIGN DATA

TREATMENT CAPACITY (CFS)	0.206
OPERATING HEAD (FT)	3.4
PRETREATMENT SURFACE AREA (SF)	70.56
WETLAND LOADING RATE (GPM/MIN)	1.03

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

MODULAR WETLANDS

MWS-L-4-17-V-UG

STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

SITE SPECIFIC DATA*

PROJECT NAME	
PROJECT LOCATION	
STRUCTURE ID	

PERFORMANCE DATA

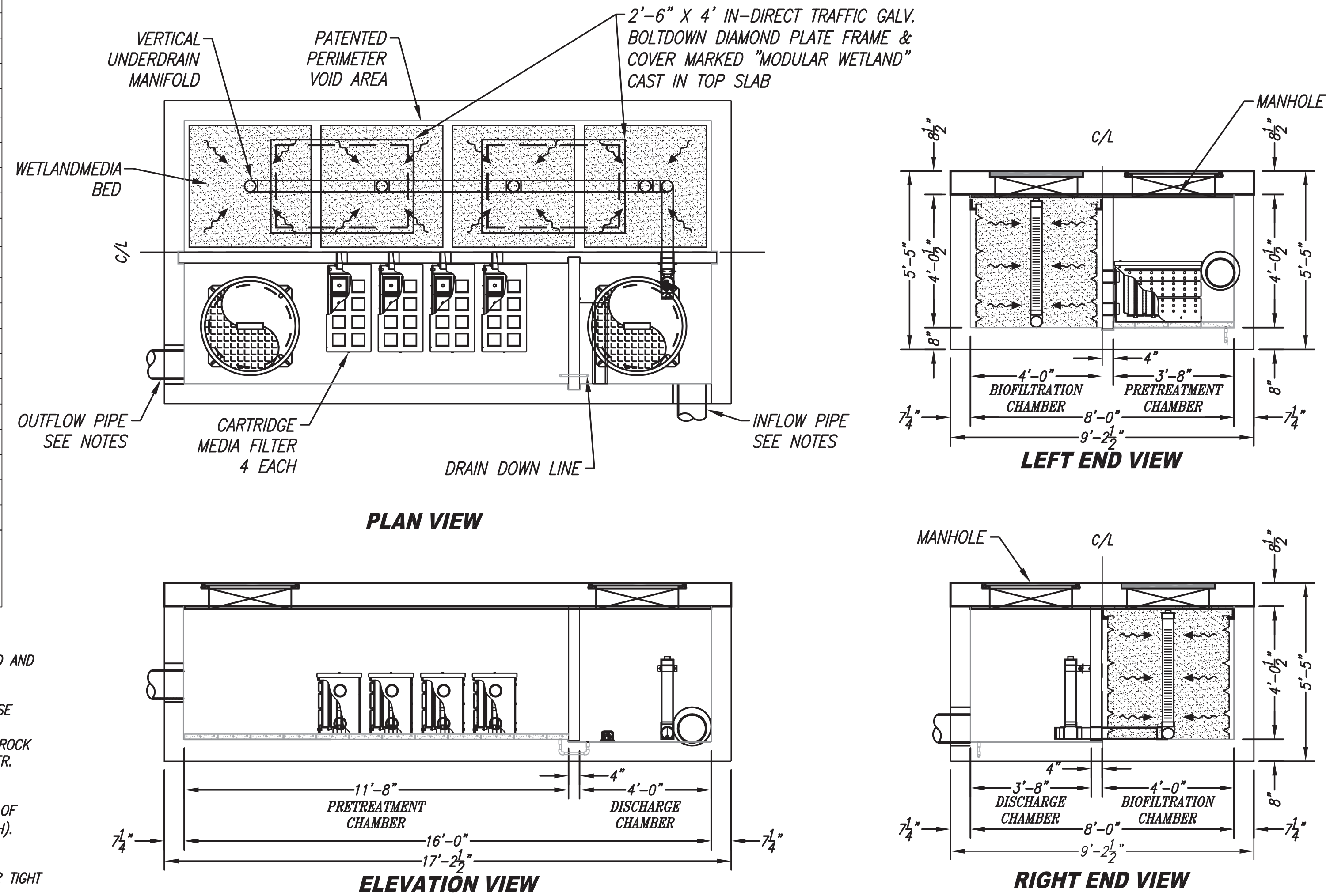
TREATMENT VOLUME (CF)	
DRAINDOWN TIME (HR)	
TREATMENT HGL (FT)	
BYPASS FLOW RATE (CFS)	

PROJECT PARAMETERS

PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
OUTLET PIPE 1			
RIM ELEVATION			
SURFACE LOADING REQUIREMENT			
FRAME & COVER	PRETREATMENT	BIOFILTRATION	DISCHARGE
WETLANDMEDIA VOLUME (CY)			
MEDIA DELIVERED			
ORIFICE SIZE (DIA)			
MAX PICK WEIGHT (LBS)			

NOTES:

*PER ENGINEER OF RECORD



MWS UNIT DESIGN DATA

TREATMENT CAPACITY (CFS)	0.462
OPERATING HEAD (FT)	3.4
PRETREATMENT SURFACE AREA (SF)	141.12
WETLAND LOADING RATE (GPM/MIN)	1.03

INSTALLATION NOTES

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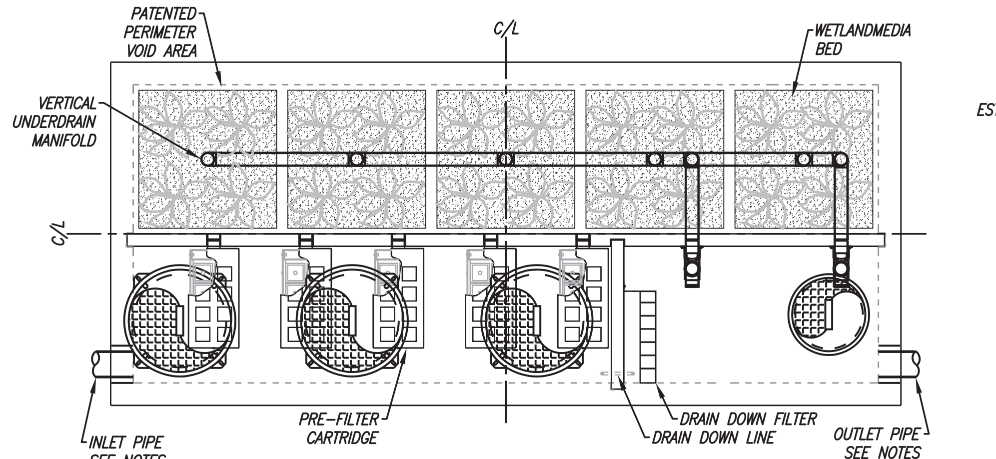
MODULAR WETLANDS

MWS-L-8-16-V-UG

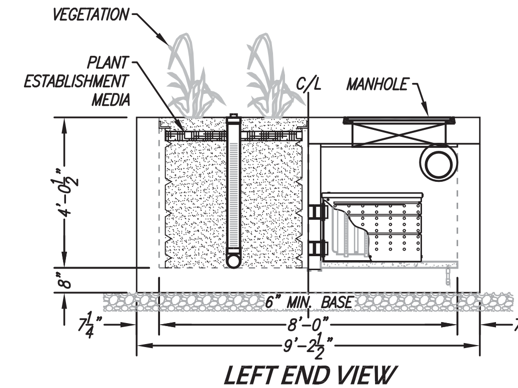
STORMWATER BIOFILTRATION SYSTEM

STANDARD DETAIL

SITE SPECIFIC DATA			
PROJECT NAME			
PROJECT LOCATION			
STRUCTURE ID			
TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
TREATMENT HGL AVAILABLE (FT)			
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION			
SURFACE LOAD	PARKWAY	OPEN PLANTER	PARKWAY
FRAME & COVER	ø30"	N/A	ø24"
WETLANDMEDIA VOLUME (CY)			11.85
WETLANDMEDIA DELIVERY METHOD			TBD
ORIFICE SIZE (DIA. INCHES)			ø2.43"
MAXIMUM PICK WEIGHT (LBS)			TBD
NOTES:			

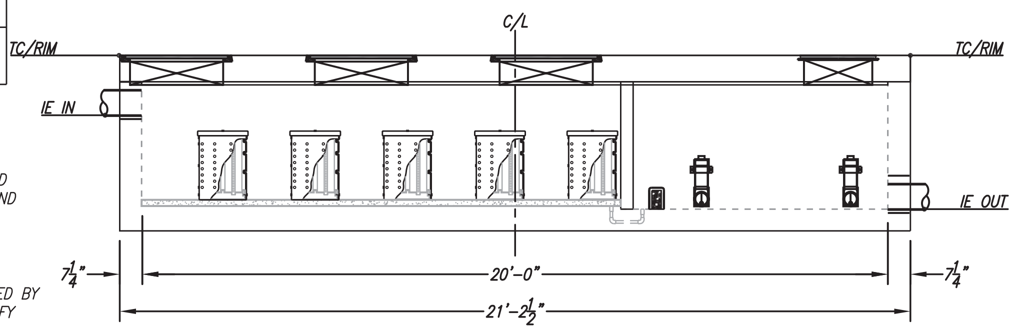


PLAN VIEW

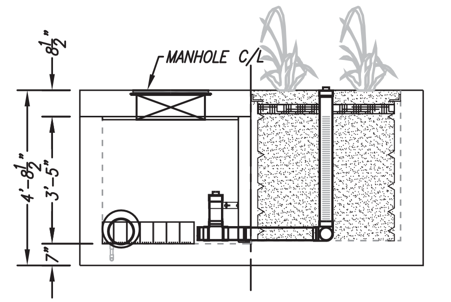


LEFT END VIEW

BIOFILTRATION/PRETREATMENT



ELEVATION VIEW



RIGHT END VIEW

DISCHARGE/BIOFILTRATION

INSTALLATION NOTES

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TREATMENT FLOW (CFS)	0.577
OPERATING HEAD (FT)	3.4
PRETREATMENT LOADING RATE (GPM/SF)	TBD
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

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MWS-L-8-20-V

STORMWATER BIOFILTRATION SYSTEM

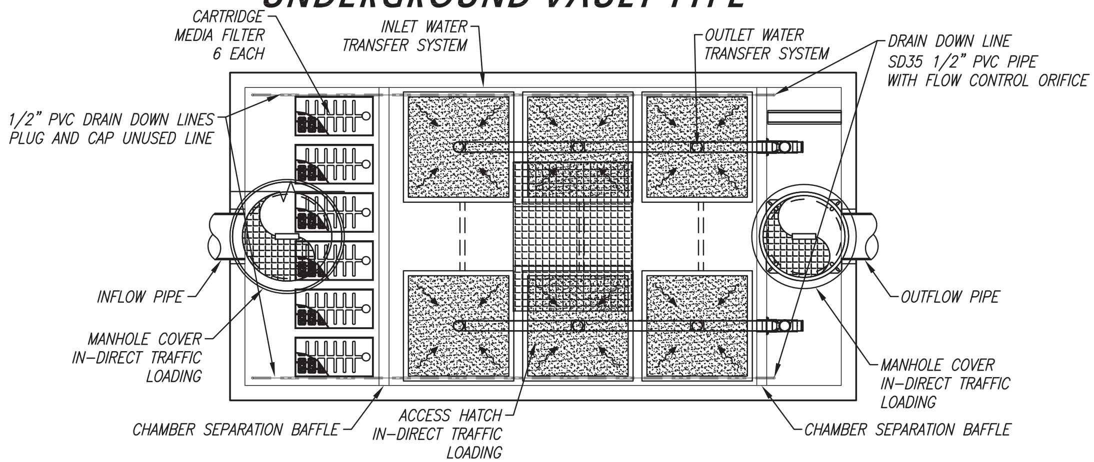
STANDARD DETAIL

6/2/15 JOHN

MODULAR WETLAND SYSTEMS LINEAR 2.0
UNDERGROUND VAULT TYPE

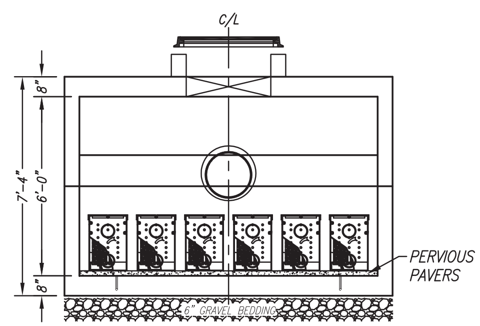
MODULAR WETLANDS™

FLOW RATES
PEAK TREATMENT FLOW RATE = 0.693 CFS OR 310.98 GPM
PEAK BYPASS FLOW RATE = N/A
SPECIFICATIONS
INSTALL AT SURFACE
O.D. DIMENSIONS = 21' X 11' X 7.33'
SEDIMENT STORAGE CAPACITY = 10,800 LBS OR 108 CF

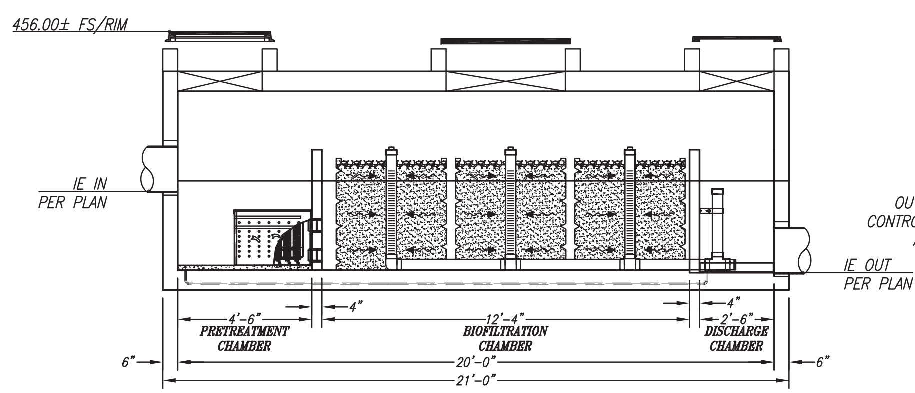


PLAN VIEW

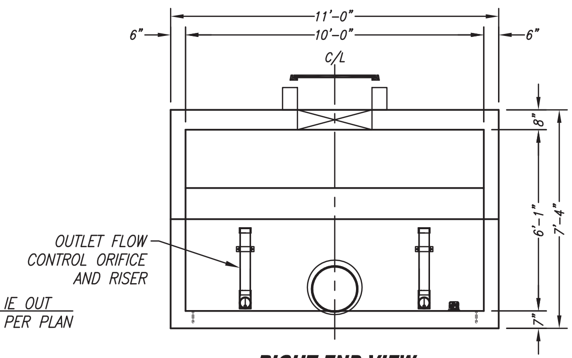
BIOFILTRATION CHAMBER SURFACE AREA CALCS
SIDES = 4
3.7' L x 3.4' H = 12.58 SF
12.58 SF X 4 SIDES = 50.32
CELLS = 6
50.32 X 6 CELLS = 301.92
TOTAL WETLAND MEDIA SURFACE AREA **= 301.92 SF**
WETLAND MEDIA LOADING RATE 310.98 GPM / 301.92 SF **= 1.03 GPM/SF**
PRETREATMENT FILTER SURFACE AREA CALCS
SIDES = 2
0.50' L x 1.67' H = 0.84 SF
SIDE SURFACE AREA = 1.68 SF
ENDS = 2
0.25' L x 1.67' H = 0.42 SF
END SURFACE AREA = 0.84 SF
TOTAL PRETREATMENT SURFACE AREA 2.52 SF x 84 FILTERS **= 211.68 SF**
PRETREATMENT FILTER LOADING RATE 310.98 GPM / 211.68 SF **= 1.47 GPM/SF**



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

LEGEND

- WETLAND MEDIA
- PLANT/ROOT MOISTURE RETENTION LAYER
- MANHOLE / ACCESS HATCH

INSTALLATION NOTES:

1. INSTALL UNIT ON LEVEL BED OF GRAVEL OF AT LEAST 6" IN DEPTH WITH 1' MINIMUM OVER EXCAVATION AROUND ENTIRE UNIT.
2. CONCRETE 28 DAY COMPRESSIVE STRENGTH fc=5,000 PSI.
3. REINFORCING: ASTM A-615, GRADE 60.
4. RATED FOR PARKWAY LOADING 300 PSF.
5. JOINT SEALANT: BUTYL RUBBER SS-S-00210

MODULAR WETLAND SYSTEMS INC.
P.O. BOX 869
OCEANSIDE, CA 92049
www.ModularWetlands.com

	NAME	DATE
DRAWN		
REVIEWED		
APPROVED		
COMMENTS:		

TITLE: MWS LINEAR 2.0 UNDERGROUND VAULT TYPE

SIZE	DWG. NO. MWS-L-10-20-UG-V	REV
SCALE NTS	UNITS = INCHES	SHEET 1 OF 1

Maintenance Procedures

Screening Device

1. Remove grate or manhole cover to gain access to the screening device in the Pre-Treatment Chamber. Vault type units do not have screening device. Maintenance can be performed without entry.
2. Remove all pollutants collected by the screening device. Removal can be done manually or with the use of a vacuum truck. The hose of the vacuum truck will not damage the screening device.
3. Screening device can easily be removed from the Pre-Treatment Chamber to gain access to separation chamber and media filters below. Replace grate or manhole cover when completed.

Separation Chamber

1. Perform maintenance procedures of screening device listed above before maintaining the separation chamber.
2. With a pressure washer spray down pollutants accumulated on walls and cartridge filters.
3. Vacuum out Separation Chamber and remove all accumulated pollutants. Replace screening device, grate or manhole cover when completed.

Cartridge Filters

1. Perform maintenance procedures on screening device and separation chamber before maintaining cartridge filters.
2. Enter separation chamber.
3. Unscrew the two bolts holding the lid on each cartridge filter and remove lid.
4. Remove each of 4 to 8 media cages holding the media in place.
5. Spray down the cartridge filter to remove any accumulated pollutants.
6. Vacuum out old media and accumulated pollutants.
7. Reinstall media cages and fill with new media from manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase.
8. Replace the lid and tighten down bolts. Replace screening device, grate or manhole cover when completed.

Drain Down Filter

1. Remove hatch or manhole cover over discharge chamber and enter chamber.
2. Unlock and lift drain down filter housing and remove old media block. Replace with new media block. Lower drain down filter housing and lock into place.
3. Exit chamber and replace hatch or manhole cover.

Maintenance Notes

1. Following maintenance and/or inspection, it is recommended the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.

2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.

3. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.

4. Entry into chambers may require confined space training based on state and local regulations.

5. No fertilizer shall be used in the Biofiltration Chamber.

6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may require irrigation.

Inspection Form

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Inspection Report
Modular Wetlands System

Project Name ____________________

Project Address ____________________ (city) (Zip Code)

Owner / Management Company ____________________

Contact ____________________ Phone (   )   –

Inspector Name ____________________ Date ___/___/_____ Time ________ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition ____________________ Additional Notes ____________________

For Office Use Only
(Reviewed By)
(Date) Office personnel to complete section to the left.

Inspection Checklist

Modular Wetland System Type (Curb, Grate or UG Vault): __________ Size (22', 14' or etc.): __________

Structural Integrity:	Yes	No	Comments
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes, specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

Waste:	Yes	No
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes: ____________________

Maintenance Report

Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Cleaning and Maintenance Report
Modular Wetlands System

Project Name ______

Project Address ______
(city) (Zip Code)

Owner / Management Company ______

Contact ______ Phone ( ) –

Inspector Name ______ Date ___ / ___ / ___ Time ______ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition ______ Additional Notes ______

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	MWS Catch Basins						
		MWS Sedimentation Basin						
		Media Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments:

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:

Laboratory Testing

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.

Field Testing

- 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/

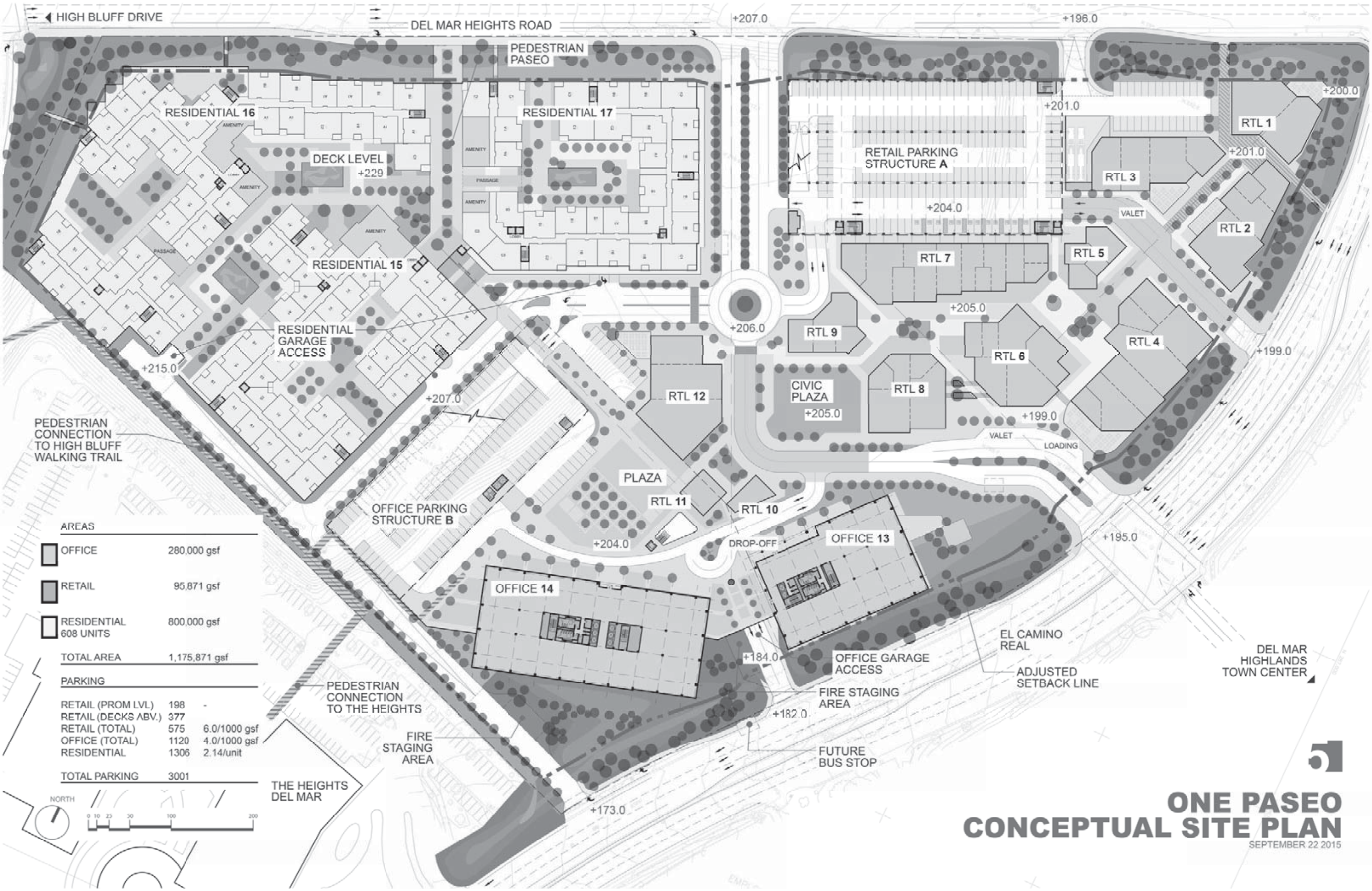
Ecology web link: http://www.ecy.wa.gov/programs/wg/stormwater/newtech/index.html

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

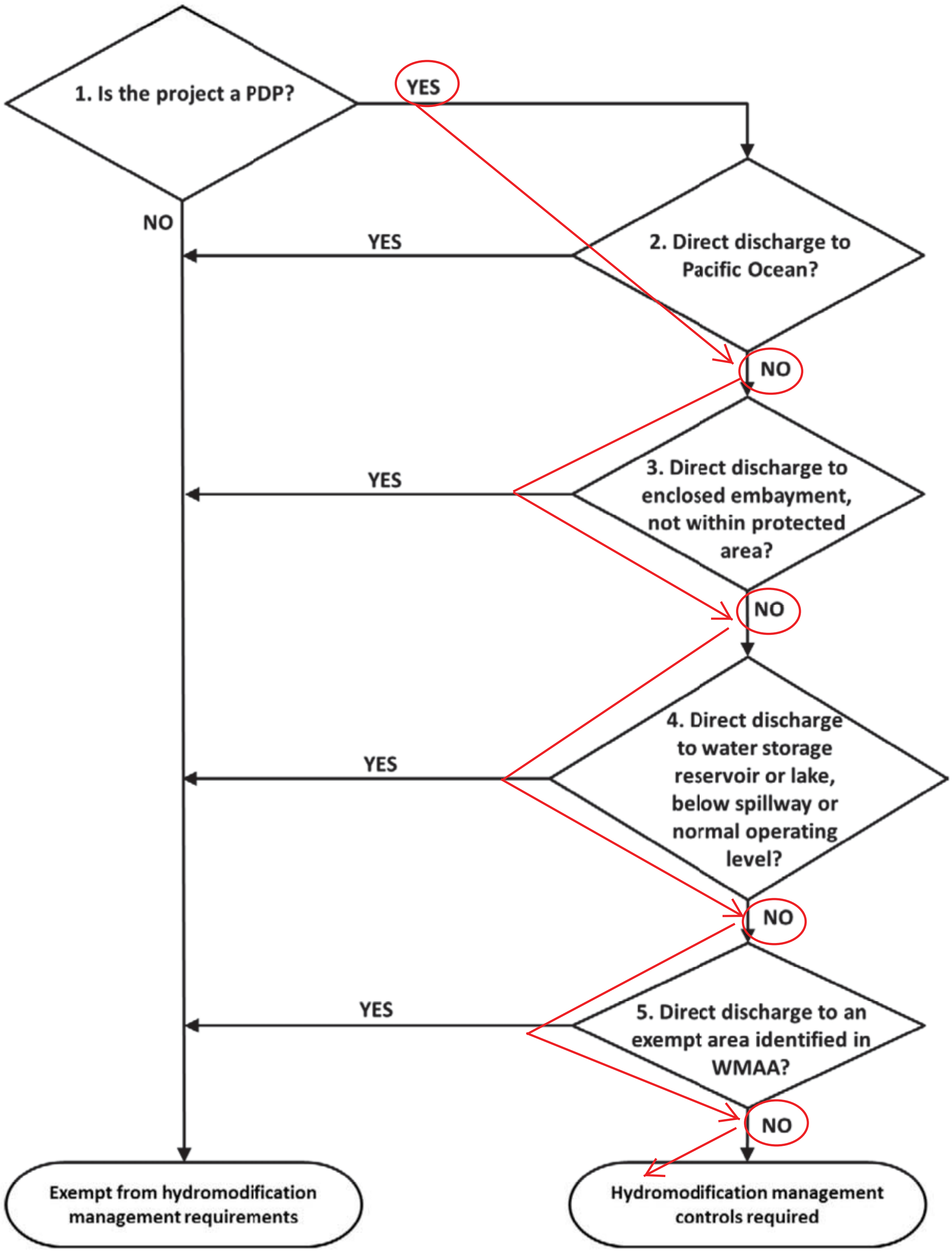
Revision History

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

APPENDIX V – Conceptual One Paseo Site Plan


HIGH BLUFF DRIVE
DEL MAR HEIGHTS ROAD
PEDESTRIAN PASEO
+207.0
+196.0
+200.0
+201.0
+201.0
RESIDENTIAL 16
RESIDENTIAL 17
DECK LEVEL +229
RETAIL PARKING STRUCTURE A
+204.0
RTL 1
RTL 2
RTL 3
RTL 4
RTL 5
RTL 6
RTL 7
RTL 8
RTL 9
RTL 10
RTL 11
RTL 12
VALET
RESIDENTIAL 15
+205.0
+206.0
+199.0
RESIDENTIAL GARAGE ACCESS
+215.0
+207.0
CIVIC PLAZA +205.0
+199.0
VALET
LOADING
PEDESTRIAN CONNECTION TO HIGH BLUFF WALKING TRAIL
PLAZA
OFFICE PARKING STRUCTURE B
+204.0
DROP-OFF
OFFICE 13
OFFICE 14
+195.0
EL CAMINO REAL
ADJUSTED SETBACK LINE
DEL MAR HIGHLANDS TOWN CENTER
+184.0
OFFICE GARAGE ACCESS
FIRE STAGING AREA
+182.0
PEDESTRIAN CONNECTION TO THE HEIGHTS
FIRE STAGING AREA
FUTURE BUS STOP
THE HEIGHTS DEL MAR
+173.0
AREAS
OFFICE 280,000 gsf
RETAIL 95,871 gsf
RESIDENTIAL 608 UNITS 800,000 gsf
TOTAL AREA 1,175,871 gsf
PARKING
RETAIL (PROM LVL) 198 -
RETAIL (DECKS ABV.) 377
RETAIL (TOTAL) 575 6.0/1000 gsf
OFFICE (TOTAL) 1120 4.0/1000 gsf
RESIDENTIAL 1306 2.14/unit
TOTAL PARKING 3001
NORTH
0 10 25 50 100 200
ONE PASEO
CONCEPTUAL SITE PLAN
SEPTEMBER 22 2015

APPENDIX VI –Figure 1-2 - HMP Applicability Determination



*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

APPENDIX VII –Storm Water Management and Discharge Control Maintenance Agreement

THE CITY OF SAN DIEGO

RECORDING REQUESTED BY:
THE CITY OF SAN DIEGO
AND WHEN RECORDED MAIL TO:

____

____

____

(THIS SPACE IS FOR RECORDER'S USE ONLY)

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT

APPROVAL NUMBER:	ASSESSORS PARCEL NUMBER:	PROJECT NUMBER:
____________________	____________________	____________________

This agreement is made by and between the City of San Diego, a municipal corporation [City] and ____,
the owner or duly authorized representative of the owner [Property Owner] of property located at

____
(Property Address)

and more particularly described as: ____

____
(Legal Description of Property)

in the City of San Diego, County of San Diego, State of California.

Property Owner is required pursuant to the City of San Diego Municipal Code, Chapter 4, Article 3, Division 3, Chapter 14, Article 2, Division 2, and the Land Development Manual, Storm Water Standards to enter into a Storm Water Management and Discharge Control Maintenance Agreement [Maintenance Agreement] for the installation and maintenance of Permanent Storm Water Best Management Practices [Permanent Storm Water BMP's] prior to the issuance of construction permits. The Maintenance Agreement is intended to ensure the establishment and maintenance of Permanent Storm Water BMP's onsite, as described in the attached exhibit(s), the project's Water Quality Technical Report [WQTR] and Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s): ________________________.

Property Owner wishes to obtain a building or engineering permit according to the Grading and/or Improvement Plan Drawing No(s) or Building Plan Project No(s): ________________________.

Continued on Page 2

NOW, THEREFORE, the parties agree as follows:

1. Property Owner shall have prepared, or if qualified, shall prepare an Operation and Maintenance Procedure [OMP] for Permanent Storm Water BMP's, satisfactory to the City, according to the attached exhibit(s), consistent with the Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s): __________.

2. Property Owner shall install, maintain and repair or replace all Permanent Storm Water BMP's within their property, according to the OMP guidelines as described in the attached exhibit(s), the project's WQTR and Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s) ___________.

3. Property Owner shall maintain operation and maintenance records for at least five (5) years. These records shall be made available to the City for inspection upon request at any time.

This Maintenance Agreement shall commence upon execution of this document by all parties named hereon, and shall run with the land.

Executed by the City of San Diego and by Property Owner in San Diego, California.

See Attached Exhibit(s): ____________________________

____
(Owner Signature)

____
(Print Name and Title)

____
(Company/Organization Name)

____
(Date)

THE CITY OF SAN DIEGO

APPROVED:

____
(City Control Engineer Signature)

____
(Print Name)

____
(Date)

NOTE: ALL SIGNATURES MUST INCLUDE NOTARY ACKNOWLEDGMENTS PER CIVIL CODE SEC. 1180 ET.SEQ.

APPENDIX VIII – Permanent BMP Construction Self Certification Form

City of San Diego
Development Services
1222 First Ave., MS-501
San Diego, CA 92101
(619) 236-5500

THE CITY OF SAN DIEGO

Permanent BMP Construction
Self Certification Form

FORM
DS-563
FEBRUARY 2013

Date Prepared:	Project No.:
Project Applicant:	Phone:
Project Address:	
Project Engineer:	Phone:

The purpose of this form is to verify that the site improvements for the project, identified above, have been constructed in conformance with the approved Standard Urban Storm Water Mitigation Plan (SUSMP) documents and drawings.

This form must be completed by the engineer and submitted prior to final inspection of the construction permit. Completion and submittal of this form is required for all new development and redevelopment projects in order to comply with the City's Storm Water ordinances and NDPES Permit Order No. R9-2007-0001. Final inspection for occupancy and/or release of grading or public improvement bonds may be delayed if this form is not submitted and approved by the City of San Diego.

CERTIFICATION:
As the professional in responsible charge for the design of the above project, I certify that I have inspected all constructed Low Impact Development (LID) site design, source control and treatment control BMP's required per the approved SUSMP and Construction Permit No. ______________________; and that said BMP's have been constructed in compliance with the approved plans and all applicable specifications, permits, ordinances and Order No. R9-2007-0001 of the San Diego Regional Water Quality Control Board.

I understand that this BMP certification statement does not constitute an operation and maintenance verification.

Signature: ____

Date of Signature: ________________________________

Printed Name: ____________________________________

Title: ____

Phone No. _______________________________________

Engineer's Stamp

APPENDIX IX – Rational Method: City of San Diego Drainage Design Manual

APPENDIX I

RATIONAL METHOD

Watersheds Less than 0.5 Square Mile

Method of Computing Runoff

Use the Rational Formula Q = CIA where:

Q is the peak rate of flow in cubic feet per second.

C is a runoff coefficient expressed as that percentage of rainfall which becomes surface runoff.

I is the average rainfall intensity in inches per hour for a storm duration equal to the time of concentration (T_c) of the contributing drainage area.

A is the drainage area in acres tributary to design point.

(1) Runoff Coefficient, C

Appendix I-A lists the estimated coefficients for urban areas.

For urban areas select an appropriate coefficient for each type of land use from Table, 2, Appendix I-A. Multiply this coefficient by the percentage of the total area included in that class. The sum of the products for all land uses in San Diego County is the weighted runoff coefficient.

(2) Rainfall Intensity, I

Intensity - duration - frequency curves applicable to all areas within San Diego County are given in Appendix I-B.

(3) Time of Concentration, Tc

The time of concentration is the time required for runoff to flow from the most remote part of the watershed to the outlet point under consideration.

APPENDIX X – Design Runoff: City of San Diego Drainage Design Manual

TABLE 2

RUNOFF COEFFICIENTS (RATIONAL METHOD)

DEVELOPED AREAS (URBAN)

Land Use	Coefficient, C Soil Type (1) D
Residential:	
Single Family	.55
Multi-Units	.70
Mobile Homes	.65
Rural (lots greater than 1/2 acre)	.45
Commercial (2) 80% Impervious	.85
Industrial (2) 90% Impervious	.95

NOTES:

(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 no case shall the final coefficient be less than 0.50. For example: Consider commercial property on D soil.

Actual imperviousness = 50%

Tabulated imperviousness = 80%

$$\text{Revised C} = \frac{50}{80} \times 0.85 = 0.53$$

APPENDIX XI – Runoff Coefficients: City of San Diego Drainage Design Manual

TABLE 2

RUNOFF COEFFICIENTS (RATIONAL METHOD)

DEVELOPED AREAS (URBAN)

Land Use	Coefficient, C Soil Type (1) D
Residential:	
Single Family	.55
Multi-Units	.70
Mobile Homes	.65
Rural (lots greater than 1/2 acre)	.45
Commercial (2) 80% Impervious	.85
Industrial (2) 90% Impervious	.95

NOTES:

(1) Type D soil to be used for all areas.

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Actual imperviousness = 50%

Tabulated imperviousness = 80%

$$\text{Revised C} = \frac{50}{80} \times 0.85 = 0.53$$

APPENDIX XII – 2 & 10 year Storm Event SSA Analysis Results

Project Description

File Name	SSA Analysis - Existing 2 yr.SPF

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	Rational
Time of Concentration (TOC) Method	User-Defined
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	NO

Analysis Options

Start Analysis On	Oct 14, 2015	00:00:00
End Analysis On	Oct 15, 2015	00:00:00
Start Reporting On	Oct 14, 2015	00:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	0
Subbasins	8
Nodes	15
Junctions	10
Outfalls	1
Flow Diversions	0
Inlets	4
Storage Nodes	0
Links	13
Channels	0
Pipes	13
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

Return Period	2 year(s)

Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	Sub-A	2.00	0.9500	0.22	0.21	0.41	4.23	0 00:05:54
2	Sub-B	1.20	0.9500	0.21	0.20	0.24	2.62	0 00:05:30
3	Sub-C	8.10	0.4500	0.45	0.20	1.65	3.81	0 00:26:00
4	Sub-D	3.90	0.4500	0.45	0.20	0.78	1.87	0 00:25:12
5	Sub-E	5.80	0.4500	0.51	0.23	1.32	2.24	0 00:35:18
6	Sub-F	0.40	0.9500	0.20	0.19	0.08	0.91	0 00:05:00
7	Sub-G	4.70	0.4500	0.35	0.16	0.74	3.16	0 00:14:06
8	Sub-H	2.10	0.9500	0.25	0.24	0.51	3.88	0 00:07:54

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	Jun-01	Junction	160.55	173.53	0.00	0.00	0.00	12.38	161.23	0.00	12.30	0 00:00	0.00	0.00
2	Jun-02	Junction	190.80	201.00	0.00	0.00	0.00	4.21	191.17	0.00	9.83	0 00:00	0.00	0.00
3	Jun-03	Junction	185.87	194.76	0.00	0.00	0.00	6.58	186.48	0.00	8.28	0 00:00	0.00	0.00
4	Jun-04	Junction	181.62	198.20	0.00	0.00	0.00	6.01	182.21	0.00	15.99	0 00:00	0.00	0.00
5	Jun-05	Junction	181.14	198.00	0.00	0.00	0.00	6.02	181.92	0.00	16.08	0 00:00	0.00	0.00
6	Jun-06	Junction	172.00	179.50	0.00	0.00	0.00	5.20	172.40	0.00	7.10	0 00:00	0.00	0.00
7	Jun-07	Junction	201.30	211.30	0.00	0.00	0.00	3.81	201.62	0.00	9.68	0 00:00	0.00	0.00
8	Jun-10	Junction	208.00	214.00	0.00	0.00	0.00	1.87	208.23	0.00	5.77	0 00:00	0.00	0.00
9	Jun-11	Junction	190.00	196.00	0.00	0.00	0.00	3.48	190.24	0.00	5.76	0 00:00	0.00	0.00
10	Jun-12	Junction	166.20	180.20	166.20	0.00	0.00	6.83	167.02	0.00	13.18	0 00:00	0.00	0.00
11	Out-01	Outfall	154.39					12.37	154.39					

Project Description

File Name .... SSA Analysis - Existing 10 yr.SPF

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	Rational
Time of Concentration (TOC) Method	User-Defined
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	NO

Analysis Options

Start Analysis On	Oct 14, 2015	00:00:00
End Analysis On	Oct 15, 2015	00:00:00
Start Reporting On	Oct 14, 2015	00:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	0
Subbasins...	8
Nodes...	15
Junctions	10
Outfalls	1
Flow Diversions	0
Inlets	4
Storage Nodes	0
Links..	13
Channels	0
Pipes	13
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

Return Period... 10 year(s)

Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	Sub-A	2.00	0.9500	0.31	0.29	0.58	5.95	0 00:05:54
2	Sub-B	1.20	0.9500	0.30	0.28	0.34	3.68	0 00:05:30
3	Sub-C	8.10	0.4500	0.68	0.31	2.49	5.73	0 00:26:00
4	Sub-D	3.90	0.4500	0.67	0.30	1.18	2.81	0 00:25:12
5	Sub-E	5.80	0.4500	0.77	0.35	2.02	3.43	0 00:35:18
6	Sub-F	0.40	0.9500	0.28	0.27	0.11	1.27	0 00:05:00
7	Sub-G	4.70	0.4500	0.52	0.23	1.10	4.66	0 00:14:06
8	Sub-H	2.10	0.9500	0.36	0.35	0.72	5.56	0 00:07:54

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft^2)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	Jun-01	Junction	160.55	173.53	0.00	0.00	0.00	18.10	161.38	0.00	12.15	0 00:00	0.00	0.00
2	Jun-02	Junction	190.80	201.00	0.00	0.00	0.00	5.93	191.23	0.00	9.77	0 00:00	0.00	0.00
3	Jun-03	Junction	185.87	194.76	0.00	0.00	0.00	9.27	186.60	0.00	8.16	0 00:00	0.00	0.00
4	Jun-04	Junction	181.62	198.20	0.00	0.00	0.00	8.61	182.35	0.00	15.85	0 00:00	0.00	0.00
5	Jun-05	Junction	181.14	198.00	0.00	0.00	0.00	8.62	182.12	0.00	15.88	0 00:00	0.00	0.00
6	Jun-06	Junction	172.00	179.50	0.00	0.00	0.00	7.75	172.48	0.00	7.02	0 00:00	0.00	0.00
7	Jun-07	Junction	201.30	211.30	0.00	0.00	0.00	5.73	201.69	0.00	9.61	0 00:00	0.00	0.00
8	Jun-10	Junction	208.00	214.00	0.00	0.00	0.00	2.81	208.28	0.00	5.72	0 00:00	0.00	0.00
9	Jun-11	Junction	190.00	196.00	0.00	0.00	0.00	5.26	190.29	0.00	5.71	0 00:00	0.00	0.00
10	Jun-12	Junction	166.20	180.20	166.20	0.00	0.00	9.87	167.26	0.00	12.94	0 00:00	0.00	0.00
11	Out-01	Outfall	154.39					18.08	154.39					

Project Description

File Name	SSA Analysis - Proposed 2 yr.SPF

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	Rational
Time of Concentration (TOC) Method	User-Defined
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	NO

Analysis Options

Start Analysis On	Oct 14, 2015	00:00:00
End Analysis On	Oct 15, 2015	00:00:00
Start Reporting On	Oct 14, 2015	00:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	0
Subbasins	51
Nodes	100
Junctions	70
Outfalls	1
Flow Diversions	0
Inlets	29
Storage Nodes	0
Links	99
Channels	0
Pipes	99
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

Return Period	2 year(s)

Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	Sub-01	1.40	0.9500	0.20	0.19	0.27	3.19	0 00:05:00
2	Sub-02	0.10	0.8500	0.20	0.17	0.02	0.20	0 00:05:00
3	Sub-03	0.20	0.8500	0.20	0.17	0.03	0.41	0 00:05:00
4	Sub-04	0.20	0.8500	0.20	0.17	0.03	0.41	0 00:05:00
5	Sub-05	0.20	0.8500	0.20	0.17	0.03	0.41	0 00:05:00
6	Sub-06	0.60	0.8500	0.20	0.17	0.10	1.22	0 00:05:00
7	Sub-07	0.40	0.8500	0.20	0.17	0.07	0.82	0 00:05:00
8	Sub-08	0.10	0.8500	0.20	0.17	0.02	0.20	0 00:05:00
9	Sub-09	0.70	0.8500	0.20	0.17	0.12	1.43	0 00:05:00
10	Sub-10	0.70	0.8500	0.20	0.17	0.12	1.43	0 00:05:00
11	Sub-11	0.70	0.8500	0.20	0.17	0.12	1.43	0 00:05:00
12	Sub-12	0.90	0.8500	0.20	0.17	0.15	1.84	0 00:05:00
13	Sub-13	1.90	0.8500	0.20	0.17	0.32	3.88	0 00:05:00
14	Sub-14	0.30	0.8500	0.20	0.17	0.05	0.61	0 00:05:00
15	Sub-15	0.50	0.8500	0.20	0.17	0.09	1.02	0 00:05:00
16	Sub-16	0.50	0.8500	0.20	0.17	0.09	1.02	0 00:05:00
17	Sub-17	0.40	0.8500	0.20	0.17	0.07	0.82	0 00:05:00
18	Sub-18	0.40	0.8500	0.20	0.17	0.07	0.82	0 00:05:00
19	Sub-19	0.30	0.8500	0.20	0.17	0.05	0.61	0 00:05:00
20	Sub-20	0.30	0.8500	0.20	0.17	0.05	0.61	0 00:05:00
21	Sub-21	1.00	0.8500	0.20	0.17	0.17	2.04	0 00:05:00
22	Sub-22	1.80	0.8500	0.20	0.17	0.31	3.67	0 00:05:00
23	Sub-23	0.60	0.8500	0.20	0.17	0.10	1.22	0 00:05:00
24	Sub-24	0.50	0.8500	0.20	0.17	0.09	1.02	0 00:05:00
25	Sub-25	0.50	0.9500	0.20	0.19	0.10	1.14	0 00:05:00
26	Sub-26	0.40	0.8500	0.20	0.17	0.07	0.82	0 00:05:00
27	Sub-27	0.20	0.8500	0.20	0.17	0.03	0.41	0 00:05:00
28	Sub-28	0.10	0.8500	0.20	0.17	0.02	0.20	0 00:05:00
29	Sub-29	0.30	0.8500	0.20	0.17	0.05	0.61	0 00:05:00
30	Sub-30	0.10	0.8500	0.20	0.17	0.02	0.20	0 00:05:00
31	Sub-31	0.20	0.8500	0.20	0.17	0.03	0.41	0 00:05:00
32	Sub-32	1.40	0.8500	0.20	0.17	0.24	2.86	0 00:05:00
33	Sub-33	0.60	0.8500	0.20	0.17	0.10	1.22	0 00:05:00
34	Sub-34	0.20	0.8500	0.20	0.17	0.03	0.41	0 00:05:00
35	Sub-35	0.60	0.8500	0.20	0.17	0.10	1.22	0 00:05:00
36	Sub-36	1.00	0.8500	0.20	0.17	0.17	2.04	0 00:05:00
37	Sub-37	1.10	0.8500	0.20	0.17	0.19	2.24	0 00:05:00
38	Sub-38	1.00	0.9500	0.20	0.19	0.19	2.28	0 00:05:00
39	Sub-39	0.30	0.8500	0.20	0.17	0.05	0.61	0 00:05:00
40	Sub-40	0.20	0.8500	0.20	0.17	0.03	0.41	0 00:05:00
41	Sub-41	0.20	0.8500	0.20	0.17	0.03	0.41	0 00:05:00
42	Sub-42	0.80	0.8500	0.20	0.17	0.14	1.63	0 00:05:00
43	Sub-43	0.10	0.8500	0.20	0.17	0.02	0.20	0 00:05:00
44	Sub-44	0.30	0.8500	0.20	0.17	0.05	0.61	0 00:05:00
45	Sub-45	0.20	0.8500	0.20	0.17	0.03	0.41	0 00:05:00
46	Sub-46	0.50	0.8500	0.20	0.17	0.09	1.02	0 00:05:00
47	Sub-47	0.60	0.8500	0.20	0.17	0.10	1.22	0 00:05:00
48	Sub-48	0.20	0.8500	0.20	0.17	0.03	0.41	0 00:05:00
49	Sub-49	0.40	0.9500	0.20	0.19	0.08	0.91	0 00:05:00
50	Sub-50	0.60	0.9500	0.20	0.19	0.11	1.37	0 00:05:00
51	Sub-51	1.40	0.9500	0.20	0.19	0.27	3.19	0 00:05:00

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft²)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	Jun-01	Junction	194.20	203.00	0.00	6.00	0.00	3.43	194.68	0.00	8.32	0 00:00	0.00	0.00
2	Jun-02	Junction	194.50	203.00	0.00	6.00	0.00	2.86	195.08	0.00	7.92	0 00:00	0.00	0.00
3	Jun-03	Junction	187.37	198.13	0.00	6.00	0.00	4.32	188.25	0.00	9.88	0 00:00	0.00	0.00
4	Jun-04	Junction	192.57	200.56	0.00	0.00	0.00	0.00	192.57	0.00	7.99	0 00:00	0.00	0.00
5	Jun-05	Junction	191.25	200.18	0.00	0.00	0.00	2.85	191.63	0.00	8.55	0 00:00	0.00	0.00
6	Jun-06	Junction	185.06	198.25	0.00	0.00	0.00	6.02	185.77	0.00	12.48	0 00:00	0.00	0.00
7	Jun-07	Junction	183.71	197.90	0.00	0.00	0.00	6.36	184.20	0.00	13.70	0 00:00	0.00	0.00
8	Jun-08	Junction	179.21	197.90	0.00	0.00	0.00	6.36	179.95	0.00	17.95	0 00:00	0.00	0.00
9	Jun-09	Junction	191.55	200.18	0.00	0.00	0.00	1.63	191.97	0.00	8.21	0 00:00	0.00	0.00
10	Jun-10	Junction	191.55	200.18	0.00	0.00	0.00	1.22	191.91	0.00	8.27	0 00:00	0.00	0.00
11	Jun-11	Junction	174.97	197.90	0.00	0.00	0.00	9.71	175.65	0.00	22.25	0 00:00	0.00	0.00
12	Jun-12	Junction	170.03	185.04	0.00	0.00	0.00	17.38	170.69	0.00	14.35	0 00:00	0.00	0.00
13	Jun-13	Junction	174.53	189.00	0.00	0.00	0.00	8.98	175.41	0.00	13.59	0 00:00	0.00	0.00
14	Jun-14	Junction	175.69	189.00	0.00	0.00	0.00	8.97	176.55	0.00	12.45	0 00:00	0.00	0.00
15	Jun-15	Junction	192.73	200.35	0.00	0.00	0.00	4.07	193.36	0.00	6.99	0 00:00	0.00	0.00
16	Jun-16	Junction	191.73	199.48	0.00	0.00	0.00	4.03	192.20	0.00	7.28	0 00:00	0.00	0.00
17	Jun-17	Junction	188.72	197.68	0.00	0.00	0.00	4.89	189.25	0.00	8.43	0 00:00	0.00	0.00
18	Jun-18	Junction	193.03	200.35	0.00	0.00	0.00	1.22	193.39	0.00	6.96	0 00:00	0.00	0.00
19	Jun-19	Junction	193.03	200.35	0.00	0.00	0.00	0.08	193.36	0.00	6.99	0 00:00	0.00	0.00
20	Jun-20	Junction	189.32	197.68	0.00	0.00	0.00	1.02	189.59	0.00	8.09	0 00:00	0.00	0.00
21	Jun-21	Junction	198.99	205.97	0.00	0.00	0.00	0.41	199.18	0.00	6.79	0 00:00	0.00	0.00
22	Jun-22	Junction	198.04	205.23	0.00	0.00	0.00	3.03	198.53	0.00	6.70	0 00:00	0.00	0.00
23	Jun-23	Junction	198.34	205.23	0.00	0.00	0.00	2.04	198.82	0.00	6.41	0 00:00	0.00	0.00
24	Jun-24	Junction	196.41	203.85	0.00	0.00	0.00	3.02	196.95	0.00	6.90	0 00:00	0.00	0.00
25	Jun-25	Junction	195.71	203.26	0.00	0.00	0.00	3.01	196.17	0.00	7.09	0 00:00	0.00	0.00
26	Jun-26	Junction	185.71	193.85	0.00	0.00	0.00	4.90	186.26	0.00	7.59	0 00:00	0.00	0.00
27	Jun-27	Junction	182.77	192.20	0.00	0.00	0.00	6.93	183.61	0.00	8.59	0 00:00	0.00	0.00
28	Jun-28	Junction	164.75	176.43	0.00	0.00	0.00	20.54	165.42	0.00	11.01	0 00:00	0.00	0.00
29	Jun-29	Junction	159.33	173.53	0.00	0.00	0.00	39.53	160.70	0.00	12.83	0 00:00	0.00	0.00
30	Jun-30	Junction	175.26	182.76	0.00	0.00	0.00	19.71	176.04	0.00	6.72	0 00:00	0.00	0.00
31	Jun-31	Junction	175.56	182.76	0.00	0.00	0.00	3.67	176.27	0.00	6.49	0 00:00	0.00	0.00
32	Jun-32	Junction	165.77	175.42	0.00	0.00	0.00	20.57	167.16	0.00	8.26	0 00:00	0.00	0.00
33	Jun-33	Junction	195.24	207.67	0.00	0.00	0.00	10.37	199.14	0.00	8.53	0 00:00	0.00	0.00
34	Jun-34	Junction	195.54	207.67	0.00	0.00	0.00	2.66	199.30	0.00	8.37	0 00:00	0.00	0.00
35	Jun-35	Junction	180.60	196.30	0.00	0.00	0.00	8.92	181.50	0.00	14.80	0 00:00	0.00	0.00
36	Jun-36	Junction	180.02	198.20	0.00	0.00	0.00	8.91	180.64	0.00	17.56	0 00:00	0.00	0.00
37	Jun-37	Junction	160.55	173.53	0.00	0.00	0.00	19.44	161.48	0.00	12.05	0 00:00	0.00	0.00
38	Jun-38	Junction	174.05	197.00	0.00	0.00	0.00	10.17	174.71	0.00	22.29	0 00:00	0.00	0.00
39	Jun-39	Junction	181.14	198.00	0.00	0.00	0.00	3.75	181.52	0.00	16.48	0 00:00	0.00	0.00
40	Jun-40	Junction	181.62	198.20	0.00	0.00	0.00	2.99	182.01	0.00	16.19	0 00:00	0.00	0.00
41	Jun-41	Junction	185.87	194.76	0.00	0.00	0.00	3.39	186.30	0.00	8.46	0 00:00	0.00	0.00
42	Jun-43	Junction	165.08	176.43	0.00	0.00	0.00	20.53	166.58	0.00	9.85	0 00:00	0.00	0.00
43	Jun-44	Junction	189.66	204.10	0.00	0.00	0.00	17.23	190.34	0.00	13.76	0 00:00	0.00	0.00
44	Jun-45	Junction	190.46	205.78	0.00	0.00	0.00	14.66	191.69	0.00	14.09	0 00:00	0.00	0.00
45	Jun-46	Junction	206.75	213.25	0.00	0.00	0.00	4.68	207.15	0.00	6.10	0 00:00	0.00	0.00
46	Jun-47	Junction	209.56	216.55	0.00	0.00	0.00	2.94	210.02	0.00	6.53	0 00:00	0.00	0.00
47	Jun-48	Junction	210.50	217.00	0.00	0.00	0.00	0.78	210.71	0.00	6.29	0 00:00	0.00	0.00
48	Jun-49	Junction	217.43	229.00	0.00	0.00	0.00	0.79	217.62	0.00	11.38	0 00:00	0.00	0.00
49	Jun-50	Junction	209.86	216.55	0.00	0.00	0.00	0.82	210.13	0.00	6.42	0 00:00	0.00	0.00
50	Jun-51	Junction	209.56	216.55	0.00	0.00	0.00	1.43	210.16	0.00	6.39	0 00:00	0.00	0.00
51	Jun-52	Junction	207.05	213.25	0.00	0.00	0.00	1.84	207.50	0.00	5.75	0 00:00	0.00	0.00
52	Jun-53	Junction	191.73	205.89	0.00	0.00	0.00	10.65	193.57	0.00	12.32	0 00:00	0.00	0.00
53	Jun-54	Junction	193.33	206.87	0.00	0.00	0.00	11.14	195.87	0.00	11.00	0 00:00	0.00	0.00
54	Jun-55	Junction	193.62	206.87	0.00	0.00	0.00	11.10	196.32	0.00	10.55	0 00:00	0.00	0.00
55	Jun-56	Junction	194.04	207.04	0.00	0.00	0.00	10.93	197.10	0.00	9.94	0 00:00	0.00	0.00
56	Jun-57	Junction	194.34	207.04	0.00	0.00	0.00	1.43	197.18	0.00	9.86	0 00:00	0.00	0.00
57	Jun-58	Junction	197.43	206.31	0.00	0.00	0.00	10.31	199.54	0.00	6.77	0 00:00	0.00	0.00
58	Jun-59	Junction	198.03	206.06	0.00	0.00	0.00	9.94	200.03	0.00	6.03	0 00:00	0.00	0.00
59	Jun-60	Junction	198.63	206.06	0.00	0.00	0.00	0.76	200.06	0.00	6.00	0 00:00	0.00	0.00
60	Jun-61	Junction	200.21	205.80	0.00	0.00	0.00	1.22	200.53	0.00	5.27	0 00:00	0.00	0.00
61	Jun-62	Junction	198.98	206.30	0.00	0.00	0.00	8.25	200.64	0.00	5.66	0 00:00	0.00	0.00
62	Jun-63	Junction	199.97	206.47	0.00	0.00	0.00	8.10	201.13	0.00	5.34	0 00:00	0.00	0.00
63	Jun-64	Junction	202.50	209.00	0.00	0.00	0.00	6.98	203.36	0.00	5.64	0 00:00	0.00	0.00
64	Jun-65	Junction	202.49	207.89	0.00	0.00	0.00	0.82	202.73	0.00	5.16	0 00:00	0.00	0.00
65	Jun-66	Junction	220.93	228.50	0.00	0.00	0.00	1.43	221.33	0.00	7.17	0 00:00	0.00	0.00
66	Jun-67	Junction	220.18	228.50	0.00	0.00	0.00	1.02	220.50	0.00	8.00	0 00:00	0.00	0.00
67	Jun-68	Junction	219.88	228.50	0.00	0.00	0.00	4.06	220.27	0.00	8.23	0 00:00	0.00	0.00
68	Jun-69	Junction	223.38	229.00	0.00	0.00	0.00	1.40	223.76	0.00	5.24	0 00:00	0.00	0.00
69	Jun-70	Junction	223.68	229.00	0.00	0.00	0.00	1.22	224.04	0.00	4.96	0 00:00	0.00	0.00
70	Jun-71	Junction	223.88	229.00	0.00	0.00	0.00	0.20	224.02	0.00	4.98	0 00:00	0.00	0.00
71	Out-01	Outfall	154.39					39.49	154.39					

Project Description

File Name	SSA Analysis - Proposed 10 yr.SPF

Project Options

Flow Units	CFS
Elevation Type	Elevation
Hydrology Method	Rational
Time of Concentration (TOC) Method	User-Defined
Link Routing Method	Hydrodynamic
Enable Overflow Ponding at Nodes	YES
Skip Steady State Analysis Time Periods	NO

Analysis Options

Start Analysis On	Oct 14, 2015	00:00:00
End Analysis On	Oct 15, 2015	00:00:00
Start Reporting On	Oct 14, 2015	00:00:00
Antecedent Dry Days	0	days
Runoff (Dry Weather) Time Step	0 01:00:00	days hh:mm:ss
Runoff (Wet Weather) Time Step	0 00:05:00	days hh:mm:ss
Reporting Time Step	0 00:05:00	days hh:mm:ss
Routing Time Step	30	seconds

Number of Elements

	Qty
Rain Gages	0
Subbasins	51
Nodes	100
Junctions	70
Outfalls	1
Flow Diversions	0
Inlets	29
Storage Nodes	0
Links	99
Channels	0
Pipes	99
Pumps	0
Orifices	0
Weirs	0
Outlets	0
Pollutants	0
Land Uses	0

Rainfall Details

Return Period	10 year(s)

Subbasin Summary

SN	Subbasin ID	Area (ac)	Weighted Runoff Coefficient	Total Rainfall (in)	Total Runoff (in)	Total Runoff Volume (ac-in)	Peak Runoff (cfs)	Time of Concentration (days hh:mm:ss)
1	Sub-01	1.40	0.9500	0.28	0.27	0.37	4.46	0 00:05:00
2	Sub-02	0.10	0.8500	0.28	0.24	0.02	0.29	0 00:05:00
3	Sub-03	0.20	0.8500	0.28	0.24	0.05	0.57	0 00:05:00
4	Sub-04	0.20	0.8500	0.28	0.24	0.05	0.57	0 00:05:00
5	Sub-05	0.20	0.8500	0.28	0.24	0.05	0.57	0 00:05:00
6	Sub-06	0.60	0.8500	0.28	0.24	0.14	1.71	0 00:05:00
7	Sub-07	0.40	0.8500	0.28	0.24	0.09	1.14	0 00:05:00
8	Sub-08	0.10	0.8500	0.28	0.24	0.02	0.29	0 00:05:00
9	Sub-09	0.70	0.8500	0.28	0.24	0.17	1.99	0 00:05:00
10	Sub-10	0.70	0.8500	0.28	0.24	0.17	1.99	0 00:05:00
11	Sub-11	0.70	0.8500	0.28	0.24	0.17	1.99	0 00:05:00
12	Sub-12	0.90	0.8500	0.28	0.24	0.21	2.56	0 00:05:00
13	Sub-13	1.90	0.8500	0.28	0.24	0.45	5.41	0 00:05:00
14	Sub-14	0.30	0.8500	0.28	0.24	0.07	0.85	0 00:05:00
15	Sub-15	0.50	0.8500	0.28	0.24	0.12	1.42	0 00:05:00
16	Sub-16	0.50	0.8500	0.28	0.24	0.12	1.42	0 00:05:00
17	Sub-17	0.40	0.8500	0.28	0.24	0.09	1.14	0 00:05:00
18	Sub-18	0.40	0.8500	0.28	0.24	0.09	1.14	0 00:05:00
19	Sub-19	0.30	0.8500	0.28	0.24	0.07	0.85	0 00:05:00
20	Sub-20	0.30	0.8500	0.28	0.24	0.07	0.85	0 00:05:00
21	Sub-21	1.00	0.8500	0.28	0.24	0.24	2.85	0 00:05:00
22	Sub-22	1.80	0.8500	0.28	0.24	0.43	5.13	0 00:05:00
23	Sub-23	0.60	0.8500	0.28	0.24	0.14	1.71	0 00:05:00
24	Sub-24	0.50	0.8500	0.28	0.24	0.12	1.42	0 00:05:00
25	Sub-25	0.50	0.9500	0.28	0.27	0.13	1.59	0 00:05:00
26	Sub-26	0.40	0.8500	0.28	0.24	0.09	1.14	0 00:05:00
27	Sub-27	0.20	0.8500	0.28	0.24	0.05	0.57	0 00:05:00
28	Sub-28	0.10	0.8500	0.28	0.24	0.02	0.29	0 00:05:00
29	Sub-29	0.30	0.8500	0.28	0.24	0.07	0.85	0 00:05:00
30	Sub-30	0.10	0.8500	0.28	0.24	0.02	0.29	0 00:05:00
31	Sub-31	0.20	0.8500	0.28	0.24	0.05	0.57	0 00:05:00
32	Sub-32	1.40	0.8500	0.28	0.24	0.33	3.99	0 00:05:00
33	Sub-33	0.60	0.8500	0.28	0.24	0.14	1.71	0 00:05:00
34	Sub-34	0.20	0.8500	0.28	0.24	0.05	0.57	0 00:05:00
35	Sub-35	0.60	0.8500	0.28	0.24	0.14	1.71	0 00:05:00
36	Sub-36	1.00	0.8500	0.28	0.24	0.24	2.85	0 00:05:00
37	Sub-37	1.10	0.8500	0.28	0.24	0.26	3.13	0 00:05:00
38	Sub-38	1.00	0.9500	0.28	0.27	0.27	3.18	0 00:05:00
39	Sub-39	0.30	0.8500	0.28	0.24	0.07	0.85	0 00:05:00
40	Sub-40	0.20	0.8500	0.28	0.24	0.05	0.57	0 00:05:00
41	Sub-41	0.20	0.8500	0.28	0.24	0.05	0.57	0 00:05:00
42	Sub-42	0.80	0.8500	0.28	0.24	0.19	2.28	0 00:05:00
43	Sub-43	0.10	0.8500	0.28	0.24	0.02	0.29	0 00:05:00
44	Sub-44	0.30	0.8500	0.28	0.24	0.07	0.85	0 00:05:00
45	Sub-45	0.20	0.8500	0.28	0.24	0.05	0.57	0 00:05:00
46	Sub-46	0.50	0.8500	0.28	0.24	0.12	1.42	0 00:05:00
47	Sub-47	0.60	0.8500	0.28	0.24	0.14	1.71	0 00:05:00
48	Sub-48	0.20	0.8500	0.28	0.24	0.05	0.57	0 00:05:00
49	Sub-49	0.40	0.9500	0.28	0.27	0.11	1.27	0 00:05:00
50	Sub-50	0.60	0.9500	0.28	0.27	0.16	1.91	0 00:05:00
51	Sub-51	1.40	0.9500	0.28	0.27	0.37	4.46	0 00:05:00

Node Summary

SN	Element ID	Element Type	Invert Elevation (ft)	Ground/Rim (Max) Elevation (ft)	Initial Water Elevation (ft)	Surcharge Elevation (ft)	Ponded Area (ft^2)	Peak Inflow (cfs)	Max HGL Elevation Attained (ft)	Max Surcharge Depth Attained (ft)	Min Freeboard Attained (ft)	Time of Peak Flooding Occurrence (days hh:mm)	Total Flooded Volume (ac-in)	Total Time Flooded (min)
1	Jun-01	Junction	194.20	203.00	0.00	6.00	0.00	4.80	194.77	0.00	8.23	0 00:00	0.00	0.00
2	Jun-02	Junction	194.50	203.00	0.00	6.00	0.00	3.99	195.21	0.00	7.79	0 00:00	0.00	0.00
3	Jun-03	Junction	187.37	198.13	0.00	6.00	0.00	6.01	188.50	0.00	9.63	0 00:00	0.00	0.00
4	Jun-04	Junction	192.57	200.56	0.00	0.00	0.00	0.00	192.57	0.00	7.99	0 00:00	0.00	0.00
5	Jun-05	Junction	191.25	200.18	0.00	0.00	0.00	3.97	191.71	0.00	8.47	0 00:00	0.00	0.00
6	Jun-06	Junction	185.06	198.25	0.00	0.00	0.00	8.48	185.95	0.00	12.30	0 00:00	0.00	0.00
7	Jun-07	Junction	183.71	197.90	0.00	0.00	0.00	9.01	184.30	0.00	13.60	0 00:00	0.00	0.00
8	Jun-08	Junction	179.21	197.90	0.00	0.00	0.00	9.01	180.13	0.00	17.77	0 00:00	0.00	0.00
9	Jun-09	Junction	191.55	200.18	0.00	0.00	0.00	2.28	192.06	0.00	8.12	0 00:00	0.00	0.00
10	Jun-10	Junction	191.55	200.18	0.00	0.00	0.00	1.71	191.99	0.00	8.19	0 00:00	0.00	0.00
11	Jun-11	Junction	174.97	197.90	0.00	0.00	0.00	13.92	175.80	0.00	22.10	0 00:00	0.00	0.00
12	Jun-12	Junction	170.03	185.04	0.00	0.00	0.00	25.28	170.82	0.00	14.22	0 00:00	0.00	0.00
13	Jun-13	Junction	174.53	189.00	0.00	0.00	0.00	12.61	175.63	0.00	13.37	0 00:00	0.00	0.00
14	Jun-14	Junction	175.69	189.00	0.00	0.00	0.00	12.62	176.76	0.00	12.24	0 00:00	0.00	0.00
15	Jun-15	Junction	192.73	200.35	0.00	0.00	0.00	5.70	193.50	0.00	6.85	0 00:00	0.00	0.00
16	Jun-16	Junction	191.73	199.48	0.00	0.00	0.00	5.65	192.30	0.00	7.18	0 00:00	0.00	0.00
17	Jun-17	Junction	188.72	197.68	0.00	0.00	0.00	6.85	189.36	0.00	8.32	0 00:00	0.00	0.00
18	Jun-18	Junction	193.03	200.35	0.00	0.00	0.00	1.71	193.49	0.00	6.86	0 00:00	0.00	0.00
19	Jun-19	Junction	193.03	200.35	0.00	0.00	0.00	0.12	193.50	0.00	6.85	0 00:00	0.00	0.00
20	Jun-20	Junction	189.32	197.68	0.00	0.00	0.00	1.42	189.65	0.00	8.03	0 00:00	0.00	0.00
21	Jun-21	Junction	198.99	205.97	0.00	0.00	0.00	0.57	199.22	0.00	6.75	0 00:00	0.00	0.00
22	Jun-22	Junction	198.04	205.23	0.00	0.00	0.00	4.23	198.63	0.00	6.60	0 00:00	0.00	0.00
23	Jun-23	Junction	198.34	205.23	0.00	0.00	0.00	2.85	198.94	0.00	6.29	0 00:00	0.00	0.00
24	Jun-24	Junction	196.41	203.85	0.00	0.00	0.00	4.22	197.07	0.00	6.78	0 00:00	0.00	0.00
25	Jun-25	Junction	195.71	203.26	0.00	0.00	0.00	4.20	196.26	0.00	7.00	0 00:00	0.00	0.00
26	Jun-26	Junction	185.71	193.85	0.00	0.00	0.00	6.85	186.39	0.00	7.46	0 00:00	0.00	0.00
27	Jun-27	Junction	182.77	192.20	0.00	0.00	0.00	9.74	183.82	0.00	8.38	0 00:00	0.00	0.00
28	Jun-28	Junction	164.75	176.43	0.00	0.00	0.00	30.92	165.62	0.00	10.81	0 00:00	0.00	0.00
29	Jun-29	Junction	159.33	173.53	0.00	0.00	0.00	56.08	161.03	0.00	12.50	0 00:00	0.00	0.00
30	Jun-30	Junction	175.26	182.76	0.00	0.00	0.00	29.02	176.20	0.00	6.56	0 00:00	0.00	0.00
31	Jun-31	Junction	175.56	182.76	0.00	0.00	0.00	5.12	176.45	0.00	6.31	0 00:00	0.00	0.00
32	Jun-32	Junction	165.77	175.42	0.00	0.00	0.00	30.84	167.60	0.00	7.82	0 00:00	0.00	0.00
33	Jun-33	Junction	195.24	207.67	0.00	0.00	0.00	11.78	203.03	0.00	4.64	0 00:00	0.00	0.00
34	Jun-34	Junction	195.54	207.67	0.00	0.00	0.00	3.59	203.08	0.00	4.59	0 00:00	0.00	0.00
35	Jun-35	Junction	180.60	196.30	0.00	0.00	0.00	12.53	181.72	0.00	14.58	0 00:00	0.00	0.00
36	Jun-36	Junction	180.02	198.20	0.00	0.00	0.00	12.53	180.78	0.00	17.42	0 00:00	0.00	0.00
37	Jun-37	Junction	160.55	173.53	0.00	0.00	0.00	28.35	161.74	0.00	11.79	0 00:00	0.00	0.00
38	Jun-38	Junction	174.05	197.00	0.00	0.00	0.00	14.66	174.85	0.00	22.15	0 00:00	0.00	0.00
39	Jun-39	Junction	181.14	198.00	0.00	0.00	0.00	5.27	181.59	0.00	16.41	0 00:00	0.00	0.00
40	Jun-40	Junction	181.62	198.20	0.00	0.00	0.00	4.21	182.09	0.00	16.11	0 00:00	0.00	0.00
41	Jun-41	Junction	185.87	194.76	0.00	0.00	0.00	4.73	186.38	0.00	8.38	0 00:00	0.00	0.00
42	Jun-43	Junction	165.08	176.43	0.00	0.00	0.00	30.78	166.97	0.00	9.46	0 00:00	0.00	0.00
43	Jun-44	Junction	189.66	204.10	0.00	0.00	0.00	24.42	190.49	0.00	13.61	0 00:00	0.00	0.00
44	Jun-45	Junction	190.46	205.78	0.00	0.00	0.00	20.62	191.96	0.00	13.82	0 00:00	0.00	0.00
45	Jun-46	Junction	206.75	213.25	0.00	0.00	0.00	6.55	207.23	0.00	6.02	0 00:00	0.00	0.00
46	Jun-47	Junction	209.56	216.55	0.00	0.00	0.00	4.11	210.12	0.00	6.43	0 00:00	0.00	0.00
47	Jun-48	Junction	210.50	217.00	0.00	0.00	0.00	1.10	210.75	0.00	6.25	0 00:00	0.00	0.00
48	Jun-49	Junction	217.43	229.00	0.00	0.00	0.00	1.11	217.65	0.00	11.35	0 00:00	0.00	0.00
49	Jun-50	Junction	209.86	216.55	0.00	0.00	0.00	1.14	210.20	0.00	6.35	0 00:00	0.00	0.00
50	Jun-51	Junction	209.56	216.55	0.00	0.00	0.00	1.99	210.28	0.00	6.27	0 00:00	0.00	0.00
51	Jun-52	Junction	207.05	213.25	0.00	0.00	0.00	2.56	207.59	0.00	5.66	0 00:00	0.00	0.00
52	Jun-53	Junction	191.73	205.89	0.00	0.00	0.00	14.24	195.46	0.00	10.43	0 00:00	0.00	0.00
53	Jun-54	Junction	193.33	206.87	0.00	0.00	0.00	13.33	198.58	0.00	8.29	0 00:00	0.00	0.00
54	Jun-55	Junction	193.62	206.87	0.00	0.00	0.00	13.33	199.80	0.00	7.07	0 00:00	0.00	0.00
55	Jun-56	Junction	194.04	207.04	0.00	0.00	0.00	13.31	201.24	0.00	5.80	0 00:00	0.00	0.00
56	Jun-57	Junction	194.34	207.04	0.00	0.00	0.00	1.99	201.31	0.00	5.73	0 00:00	0.00	0.00
57	Jun-58	Junction	197.43	206.31	0.00	0.00	0.00	11.49	206.31	0.00	0.00	0 00:05	0.00	0.00
58	Jun-59	Junction	198.03	206.06	0.00	0.00	0.00	10.80	206.06	0.00	0.00	0 00:05	0.00	0.00
59	Jun-60	Junction	198.63	206.06	0.00	0.00	0.00	1.39	206.06	0.00	0.00	0 00:05	0.00	0.00
60	Jun-61	Junction	200.21	205.80	0.00	0.00	0.00	6.50	205.80	0.00	0.00	0 00:05	0.00	0.00
61	Jun-62	Junction	198.98	206.30	0.00	0.00	0.00	9.66	205.93	0.00	0.37	0 00:00	0.00	0.00
62	Jun-63	Junction	199.97	206.47	0.00	0.00	0.00	11.03	206.47	0.00	0.00	0 00:06	0.06	2.00
63	Jun-64	Junction	202.50	209.00	0.00	0.00	0.00	9.83	209.00	0.00	0.00	0 00:05	0.00	0.00
64	Jun-65	Junction	202.49	207.89	0.00	0.00	0.00	4.04	207.89	0.00	0.00	0 00:05	0.00	0.00
65	Jun-66	Junction	220.93	228.50	0.00	0.00	0.00	1.99	221.44	0.00	7.06	0 00:00	0.00	0.00
66	Jun-67	Junction	220.18	228.50	0.00	0.00	0.00	1.42	220.58	0.00	7.92	0 00:00	0.00	0.00
67	Jun-68	Junction	219.88	228.50	0.00	0.00	0.00	5.71	220.35	0.00	8.15	0 00:00	0.00	0.00
68	Jun-69	Junction	223.38	229.00	0.00	0.00	0.00	1.95	223.84	0.00	5.16	0 00:00	0.00	0.00
69	Jun-70	Junction	223.68	229.00	0.00	0.00	0.00	1.71	224.12	0.00	4.88	0 00:00	0.00	0.00
70	Jun-71	Junction	223.88	229.00	0.00	0.00	0.00	0.28	224.05	0.00	4.95	0 00:00	0.00	0.00
71	Out-01	Outfall	154.39					56.04	154.39					

APPENDIX XIII – Downstream SCCWRP Analysis by Chang Consultants – The Heights

HYDROMODIFICATION SCREENING

FOR

THE HEIGHTS AT DEL MAR

July 24, 2014

REGISTERED PROFESSIONAL ENGINEER
WAYNE W. CHANG
No. 46548
Exp. 6/30/15
CIVIL
STATE OF CALIFORNIA

Chang Consultants
Civil Engineering ◦ Hydrology ◦ Hydraulics ◦ Sedimentation

P.O. Box 9496
Rancho Santa Fe, CA 92067
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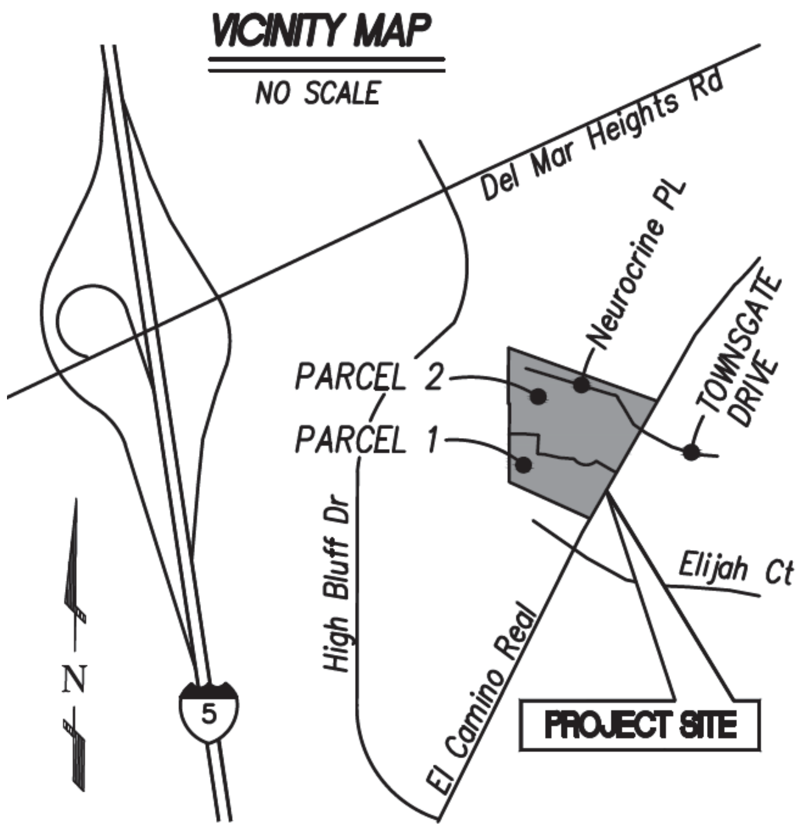
APPENDICES

INTRODUCTION

The City of San Diego's January 14, 2011, *Storm Water Standards*, outline low flow thresholds for hydromodification analyses. The thresholds are based on a percentage of the pre-project 2-year flow (Q_2), i.e., $0.1Q_2$ (low flow threshold and high susceptibility to erosion), $0.3Q_2$ (medium flow threshold and medium susceptibility to erosion), or $0.5Q_2$ (high flow threshold and low susceptibility to erosion). A flow threshold of $0.1Q_2$ represents a natural downstream receiving conveyance system with a high susceptibility to bed and/or bank erosion. This is the default value used for hydromodification analyses and will result in the most conservative (largest) on-site facility sizing. A flow threshold of $0.3Q_2$ or $0.5Q_2$ represents downstream receiving conveyance systems with a medium or low susceptibility to erosion, respectively. In order to qualify for a medium or low erosion susceptibility rating, a project must perform a channel screening analysis based on the March 2010, *Hydromodification Screening Tools: Field Manual for Assessing Channel Susceptibility*, developed by the Southern California Coastal Water Research Project (SCCWRP). The SCCWRP results are compared with the critical shear stress calculator results from the County of San Diego's BMP Sizing Calculator to establish the appropriate erosion susceptibility threshold of low, medium, or high.

This report provides hydromodification screening analyses for The Heights at Del Mar project being designed by Kettler Leweck Engineering. The project is a proposed commercial development located along the west side of El Camino Real just south of Townsgate Drive in the city of San Diego (see the Vicinity Map below and the Study Area Exhibit after the figures). The project will construct a large commercial/office building and parking on 2.49 acres of disturbance. The project is subject to hydromodification requirements because it is a priority development project.



Under pre-project conditions, a portion of the overall site has been developed with commercial buildings as well as associated parking and drive aisles (per Drawing No. 32429-D for Neurocrine Biosciences). The project footprint is primarily within the southerly portion of the overall site (parking will also be added to the northwest corner), has been mass-graded to a large earthen pad, and is surrounded by existing parking and drive aisles. Storm runoff is conveyed away from the project footprint by a storm drain system (18-inch RCP) that connects to a public 84-inch RCP storm drain in El Camino Real (per Drawing No. 20957-D). The drainage system in El Camino Real continues in a southerly direction and ultimately outlets into Carmel Valley Creek approximately 1 mile south of the site. The outlet location is directly south of State Route 56 and east of Interstate 5 (see the Study Area Exhibit).

Under post-project conditions, storm runoff from the site will continue to be conveyed to the adjacent storm drain system in El Camino Real and then to the single outlet location into Carmel Valley Creek (see Figure 11). The outlet is the first location where the project runoff will enter a natural channel that is subject to erosion. Therefore, the outlet is the point of compliance for channel screening purposes. Carmel Valley Creek continues westerly for a short distance and enters Los Penasquitos Lagoon just west of Interstate 5.

The SCCWRP screening tool requires both office and field work to establish the vertical and lateral susceptibility of a downstream receiving channel to erosion. The vertical and lateral assessments are performed independently of each other although the lateral results can be affected by the vertical rating. A screening analysis was performed to assess the low flow threshold for the project's point of compliance.

The initial step in performing the SCCWRP screening analysis is to establish the domain of analysis and the study reaches within the domain. This is followed by office and field components of the screening tool along with the associated analyses and results. The following sections cover these procedures in sequence.

DOMAIN OF ANALYSIS

SCCWRP defines an upstream and downstream domain of analysis, which establish the study limits. The County of San Diego's March 2011, *Final Hydromodification Management Plan* (HMP), specifies the downstream domain of analysis based on the SCCWRP criteria. The HMP indicates that the downstream domain is the first point where one of these is reached:

- at least one reach downstream of the first grade control point
- tidal backwater/lentic waterbody
- equal order tributary
- a 2-fold increase in drainage area

The upstream limit is defined as:

- proceed upstream for 20 channel top widths or to the first grade control point, whichever comes first. Identify hard points that can check headward migration and evidence of active headcutting.

SCCWRP defines the maximum spatial unit, or reach (a reach is circa 20 channel widths), for assigning a susceptibility rating within the domain of analysis to be 200 meters (656 feet). If the domain of analysis is greater than 200 meters, the study area should be subdivided into smaller reaches of less than 200 meters for analysis. Most of the units in the HMP's SCCWRP analysis are metric. Metric units are used in this report only where given so in the HMP. Otherwise English units are used.

Downstream Domain of Analysis

The downstream domain of analysis for the study area has been determined by assessing and comparing the four bullet items above for Carmel Valley Creek. The existing drainage outfall into the creek (see Figure 11) described in the Introduction is the point of compliance (POC), which is identified on the Study Area Exhibit after the figures. The downstream domain of analysis is selected below this POC.

Per the first bullet item, the first grade control in Carmel Valley Creek below the POC was determined through a site visit and review of aerial photographs. This research revealed that the closest grade control occurs at existing triple reinforced concrete box culverts under Sorrento Valley Road (see Figure 7 and the Study Area Exhibit) immediately west of Interstate 5. The box culverts are non-erodible facilities that will control the upstream channel bed grades, i.e., they will prevent the upstream natural channel from eroding below the culvert flowline elevations. Since the box culverts are under a public street they have been engineered as a public improvement.

The second bullet item is the tidal backwater or lentic (standing or still water such as ponds, pools, marshes, lakes, etc.) waterbody location. The area immediately downstream of the Sorrento Valley Road box culverts is Los Penasquitos Lagoon. Figures 7 and 8 show water in the lagoon reaching the box culverts. Therefore, Los Penasquitos Lagoon is the closest lentic waterbody below the POC.

The final two bullet items are related to the tributary drainage area. Carmel Valley Creek confluences with Los Penasquitos Creek immediately downstream of the Sorrento Valley Road box culverts. The Federal Emergency Management Agency's (FEMA) May 16, 2012, *Flood Insurance Study, San Diego County, California and Incorporated Areas,* states that the Carmel Valley Creek drainage area at Soledad Canyon (i.e., at Los Penasquitos Lagoon) covers 15.7 square miles (see Appendix A for excerpt). The FEMA *Flood Insurance Study* also states that the Los Penasquitos Creek drainage area at Soledad Canyon covers 58.3 square miles. Therefore, Carmel Valley Creek experiences a much greater than two-fold increase in tributary area at the confluence with Los Penasquitos Creek.

Based on the above information, the first permanent grade control, lentic waterbody, and tributary area criteria all essentially occur at the Sorrento Valley Road box culverts. Therefore, the downstream domain of analysis location below the POC is at the entrance to the box culverts.

Upstream Domain of Analysis

The upstream domain of analysis can be based on the closest grade control point above the POC. The grade control features exist at the El Camino Real crossing of Carmel Valley Creek. The crossing contains a bridge with six pier walls as well as an asphalt bike/pedestrian path, which will control the channel grades. In addition, a February 2010 Caltrans', *Carmel Valley Creek Location Hydraulic Study*, determined that the 100-year flow velocities at the crossing are 1.4 meters per second (4.6 feet per second), which is less than the typical erosive threshold of 5 to 6 fps. Therefore, the crossing location will also naturally act as a grade control due to the low flow velocities and dense vegetation.

Study Reaches within Domain of Analysis

The entire domain of analysis extends over 1,627 feet from the upstream to downstream domain of analysis locations. The domain of analysis was subdivided into two study reaches (see the Study Area Exhibit). Reach 1 stretches over 820 feet from the upstream domain of analysis location to the POC. Reach 2 extends over 807 feet from the POC to the downstream domain of analysis location. Reaches 1 and 2 are longer than the 656 feet (200 meters) maximum reach length specified by SCCWRP. Review of topographic mapping, aerial photographs, and field conditions reveals that the physical (channel geometry and longitudinal slope), vegetative, hydraulic, and soil conditions within each reach are relatively uniform. Subdividing the reaches into smaller subreaches of less than 656 feet will not yield significantly varying results within a reach. Although the screening tool was applied across the entire length of each of these reaches, the results will be similar for shorter subreaches within each reach.

INITIAL DESKTOP ANALYSIS

After the domain of analysis is established, SCCWRP requires an "initial desktop analysis" that involves office work. The initial desktop analysis establishes the watershed area, mean annual precipitation, valley slope, and valley width. These terms are defined in Form 1, which is included in Appendix A. SCCWRP recommends the use of National Elevation Data (NED) to determine the watershed area, valley slope, and valley width. The NED data is similar to USGS mapping, so it does not have high precision. As a result, SANGIS' 2-foot contour interval topographic mapping was used to assist in establishing the valley slope and valley width.

The watershed area has been established by the FEMA *Flood Insurance Study*. As mentioned in the above Downstream Domain of Analysis section, the Carmel Valley Creek watershed at Soledad Canyon covers 15.7 square miles. This location corresponds to the lower end of Reach 1. This area was also used for Reach 2. Since the area is slightly larger than the actual watershed area tributary to Reach 2, it will yield somewhat conservative results (i.e., more potential for erosion) in the Reach 2 analysis.

The mean annual precipitation was obtained from the rain gages closest to the site. These are the Western Regional Climate Center's Lockwood Mesa gage in Solana Beach and their Sea World gage (see Appendix A). The average annual rainfall measured at the Lockwood Mesa gage for the period of record from 1940 to 1965 is 9.66 inches and at Sea World from 1999 to 2012 is

9.63 inches. These values are almost equivalent. The 9.66 inches was chosen for the analyses because it is slightly higher so will predict greater erosion susceptibility.

The valley slope of each study reach was determined from the SANGIS 2-foot contour interval topographic mapping. The valley slope is the longitudinal slope of the channel bed along the flow line, so it is determined by dividing the elevation difference within the reach by the length of the flow line. The valley width is the average channel bottom width and was determined from the 2-foot mapping and review of aerial photographs. The tributary drainage area, valley slope, and valley width for Reach 1 and 2 are summarized in Table 1.

Study Reach	Tributary Drainage Area, sq. mi.	Valley Slope, m/m	Valley Width, m
Reach 1	15.7	0.0027	32.0
Reach 2	15.7	0.0059	59.4

Table 1. Summary of Tributary Drainage Area, Valley Slope, and Valley Width

These values were input to a spreadsheet to calculate the simulated peak flow, screening index, reference width, and valley width index outlined in Form 1. The input data and results are tabulated in Appendix A. This completes the initial desktop analysis.

FIELD SCREENING

After the initial desktop analysis is complete, a field assessment must be performed. The field assessment is used to establish a natural channel's vertical and lateral susceptibility to erosion. SCCWRP states that although they are admittedly linked, vertical and lateral susceptibility are assessed separately for several reasons. First, vertical and lateral responses are primarily controlled by different types of resistance, which, when assessed separately, may improve ease of use and lead to increased repeatability compared to an integrated, cross-dimensional assessment. Second, the mechanistic differences between vertical and lateral responses point to different modeling tools and potentially different management strategies. Having separate screening ratings may better direct users and managers to the most appropriate tools for subsequent analyses.

The field screening tool uses combinations of decision trees and checklists. Decision trees are typically used when a question can be answered fairly definitively and/or quantitatively (e.g., d_{50} < 16 mm). Checklists are used where answers are relatively qualitative (e.g., the condition of a grade control). Low, medium, high, and very high ratings are applied separately to the vertical and lateral analyses. When the vertical and lateral analyses return divergent values, the most conservative value shall be selected as the flow threshold for the hydromodification analyses.

Vertical Stability
The purpose of the vertical stability decision tree (Figure 6-4 in the County of San Diego HMP) is to assess the state of the channel bed with a particular focus on the risk of incision (i.e., down

cutting). The decision tree is included in Figure 12. The first step is to assess the channel bed resistance. There are three categories defined as follows:

1. Labile Bed – sand-dominated bed, little resistant substrate.

2. Transitional/Intermediate Bed – bed typically characterized by gravel/small cobble, Intermediate level of resistance of the substrate and uncertain potential for armoring.

3. Threshold Bed (Coarse/Armored Bed) – armored with large cobbles or larger bed material or highly-resistant bed substrate (i.e., bedrock).

Figures 9 and 10 contain photographs of the bed material along Reach 1 and 2, respectively. A gravelometer is included in the photographs for reference. Each square on the gravelometer indicates grain size in millimeters (the squares range from 2 mm to 180 mm). Based on the photographs and site investigation, the bed material and resistance is generally within the transitional/intermediate bed category. A pebble count was performed that determined the median (d_{50}) bed material size to be 22.6 millimeters (mm) in Reach 1 and in Reach 2 (see Appendix B). Figure 6-4 in the County HMP indicates that a d_{50} of 16 mm or greater is within the transitional/intermediate bed category. Therefore, both reaches were analyzed using the transitional/intermediate bed procedure. This requires the most rigorous steps and will generate the appropriate results for the size range.

Transitional/intermediate beds cover a wide susceptibility/potential response range and need to be assessed in greater detail to develop a weight of evidence for the appropriate screening rating. The three primary risk factors used to assess vertical susceptibility for channels with transitional/intermediate bed materials are:

1. Armoring potential – three states (Checklist 1)

2. Grade control – three states (Checklist 2)

3. Proximity to regionally-calibrated incision/braiding threshold (Mobility Index Threshold – Probability Diagram)

These three risk factors are assessed using checklists and a diagram (see Appendix B), and the results of each are combined to provide a final vertical susceptibility rating for the intermediate/transitional bed-material group. Each checklist and diagram contains a Category A, B, or C rating. Category A is the most resistant to vertical changes while Category C is the most susceptible.

Checklist 1 determines armoring potential of the channel bed. The natural channel bed along Reach 1 and 2 are assigned to Category B, which represents intermediate bed material of unknown resistance or unknown armoring potential due to a surface veneer such as vegetation. The soil was probed and penetration was relatively difficult through the underlying layer. The channel bed in both reaches was covered with dense vegetation (see Figures 1 through 6).

Checklist 2 determines grade control characteristics of the channel bed. SCCWRP states that grade controls can be natural. Examples are vegetation or confluences with a larger waterbody. As verified with photographs and during a site investigation, each reach contains mature, dense, uniform vegetation (see Figures 1 through 6). The plant roots and tree trunks serve as a natural grade control. The spacing of these is much closer than the 50 meters identified in the checklist. Further evidence of the effectiveness of the natural grade controls is the absence of headcutting and mass wasting (large vertical erosion of a channel bank). Based on this information, each reach is within Category A on Checklist 2. The presence of dense, mature vegetation throughout both reaches further confirms that the reaches exhibit stability and are within Category A on Checklist 2.

The Mobility Index Threshold is a probability diagram that depicts the risk of incising or braiding based on the potential stream power of the valley relative to the median particle diameter. The threshold is based on regional data from Dr. Howard Chang of Chang Consultants and others. The probability diagram is based on d_{50} as well as the Screening Index determined in the initial desktop analysis (see Appendix A). d_{50} is derived from a pebble count in which a minimum of 100 particles are obtained along transects at the site. SCCRWP states that if fines less than ½-inch thick are at a sample point, it is appropriate to sample the coarser buried substrate. The d_{50} value is the particle size in which 50 percent of the particles are smaller and 50 percent are larger. The pebble count results for Reaches 1 and 2 are included in Appendix B. The results show a d_{50} of 22.6 millimeters (mm) for both Reach 1 and Reach 2. The screening index values for both reaches are tabulated in Appendix A. The Mobility Index Threshold diagram shows that there is less than 50 percent probability of incision if the screening index value is less than 0.058 for a 22.6 mm d_{50}. The screening index values in Appendix A for Reach 1 and 2 are 0.0153 and 0.0339, respectively. Both values are less than 0.058, so each reach has less than 50 percent probability of incision.

The overall vertical rating is determined from the Checklist 1, Checklist 2, and Mobility Index Threshold results. The scoring is based on the following values:

Category A = 3, Category B = 6, Category C = 9

The vertical rating score is based on these values and the equation:

$$
\begin{aligned}
\text{Vertical Rating} &= [(\text{armoring} \times \text{grade control})^{1/2} \times \text{screening index score}]^{1/2} \\
&= [(6 \times 3)^{1/2} \times 3]^{1/2} \\
&= 3.6
\end{aligned}
$$

Since the vertical rating is less than 4.5 for Reach 1 and 2, each reach has a low threshold for vertical susceptibility.

Lateral Stability

The purpose of the lateral decision tree (Figure 6-5 from County of San Diego HMP included in Figure 13) is to assess the state of the channel banks with a focus on the risk of widening. Channels can widen from either bank failure or through fluvial processes such as chute cutoffs, avulsions, and braiding. Widening through fluvial avulsions/active braiding is a relatively straightforward observation. If braiding is not already occurring, the next logical step is to assess the condition of the banks. Banks fail through a variety of mechanisms; however, one of the most important distinctions is whether they fail in mass (as many particles) or by fluvial detachment of individual particles. Although much research is dedicated to the combined effects of weakening, fluvial erosion, and mass failure, SCCWRP found it valuable to segregate bank types based on the inference of the dominant failure mechanism (as the management approach may vary based on the dominant failure mechanism). A decision tree (Form 4 in Appendix B) is used in conducting the lateral susceptibility assessment. Definitions and photographic examples are also provided below for terms used in the lateral susceptibility assessment.

The first step in the decision tree is to determine if lateral adjustments are occurring. The adjustments can take the form of extensive mass wasting (greater than 50 percent of the banks are exhibiting planar, slab, or rotational failures and/or scalloping, undermining, and/or tension cracks). The adjustments can also involve extensive fluvial erosion (significant and frequent bank cuts on over 50 percent of the banks). Neither mass wasting nor extensive fluvial erosion was evident within any of the reaches during a field investigation. Reach 1 and 2 both have a generally trapezoidal cross-section with banks that are not subject to stream erosion (see Figures 1 through 6).

The next step in the Form 4 decision tree is to assess the consolidation of the bank material. The banks were moderate to well-consolidated. This determination was made because the ground surface was difficult to penetrate with a probe. In addition, the banks showed no evidence of crumbling and were composed of relatively well-packed particles as well as cobbles in some areas (see Figure 1 and 6).

Form 6 (see Appendix B) is used to assess the probability of mass wasting. Form 6 identifies a 10, 50, and 90 percent probability based on the bank angle and bank height. Based on the topographic mapping and site investigation, the banks along the drainage course of Reach 1 and 2 are 2:1 (26 degrees) or flatter. Form 6 shows that the probably of mass wasting and bank failure has less than 10 percent risk for a 26 degree bank angle or less regardless of the bank height.

The final two steps in the Form 4 decision tree are based on the braiding risk determined from the vertical rating as well as the Valley Width Index (VWI) calculated in Appendix A. If the vertical rating is high, the braiding risk is considered to be greater than 50 percent. Excessive braiding can lead to lateral bank failure. For Reach 1 and 2 the vertical rating is low, so the braiding risk is less than 50 percent. Furthermore, a VWI greater than 2 represents channels unconfined by bedrock or hillslope and, hence, subject to lateral migration. The VWI calculations in the spreadsheet in Appendix A show that the VWI for each reach is less than 2.

From the above steps, the lateral susceptibility rating is low (red circles are included on the Form 4: Lateral Susceptibility Field Sheet decision tree in Appendix B showing the decision path).

CONCLUSION

The SCCWRP channel screening tools were used to assess the downstream channel susceptibility for The Heights at Del Mar commercial project by Kettler Leweck Engineering. The project runoff will be conveyed to an existing drainage system in El Camino Real along the east side of the site. The existing drainage system is stable, engineered, and discharges into Carmel Valley Creek approximately 1 mile south of the site. Carmel Valley Creek is a natural drainage course that supports dense, mature vegetation. The assessment was performed for Carmel Valley Creek. There is no evidence of significant vertical or lateral stream-induced erosion in the creek within the domain of analysis. The downstream channel assessment for the two study reaches was performed based on office analyses and field work. The results indicate a low threshold for vertical and lateral susceptibilities to erosion for both reaches, which is consistent with the physical conditions.

The HMP requires that these results be compared with the critical stress calculator results incorporated in the County of San Diego’s BMP Sizing Calculator. The BMP Sizing Calculator critical stress results are included in Appendix B for Reaches 1 and 2. Based on these values, the critical stress results returned a low threshold. Therefore, the SCCWRP analyses and critical stress calculator demonstrate that the project can be designed assuming a low susceptibility to erosion, i.e., $0.5Q_2$.

Figure 1. Looking Downstream towards Reach 1 from Upper End at El Camino Real

Figure 2. Looking South towards Middle of Reach 1

Figure 3. Looking Upstream towards Reach 1 from Lower End

Figure 4. Looking Downstream towards Reach 2 from Upper End

Figure 5. Looking South towards Middle of Reach 2

Figure 6. Lower End of Reach 2 at Interstate 5 Bridge

Figure 7. Box Culverts under Sorrento Valley Road at Downstream End of Reach 2

Figure 8. Looking Downstream Towards Los Penasquitos Lagoon from Sorrento Valley Road

Figure 9. Gravelometer in Reach 1

Figure 10. Gravelometer in Reach 2

Figure 11. Point of Compliance at Discharge of Public Drainage System into Carmel Valley Creek

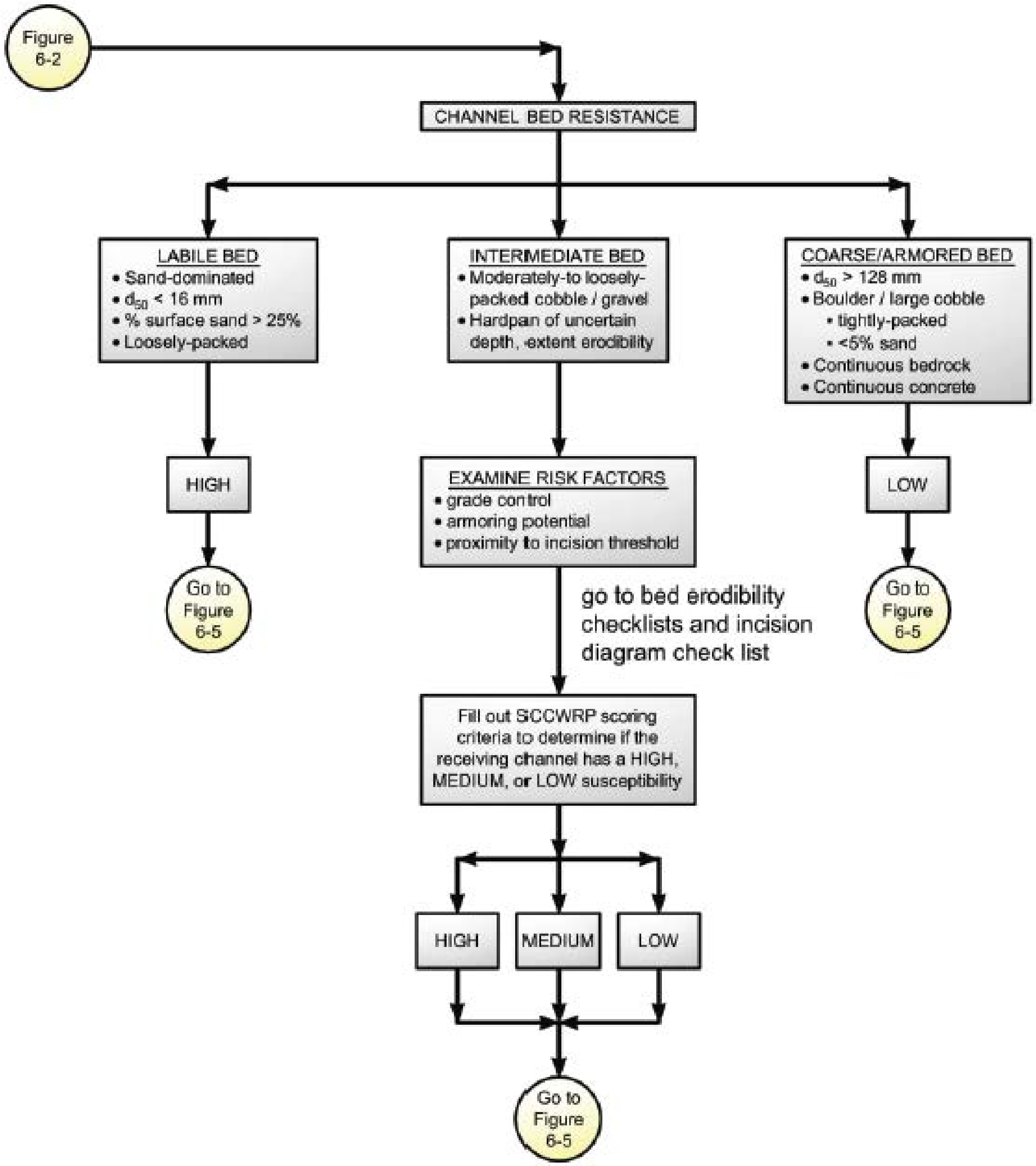


Figure 6-4. SCCWRP Vertical Susceptibility

Figure 12. SCCWRP Vertical Channel Susceptibility Matrix

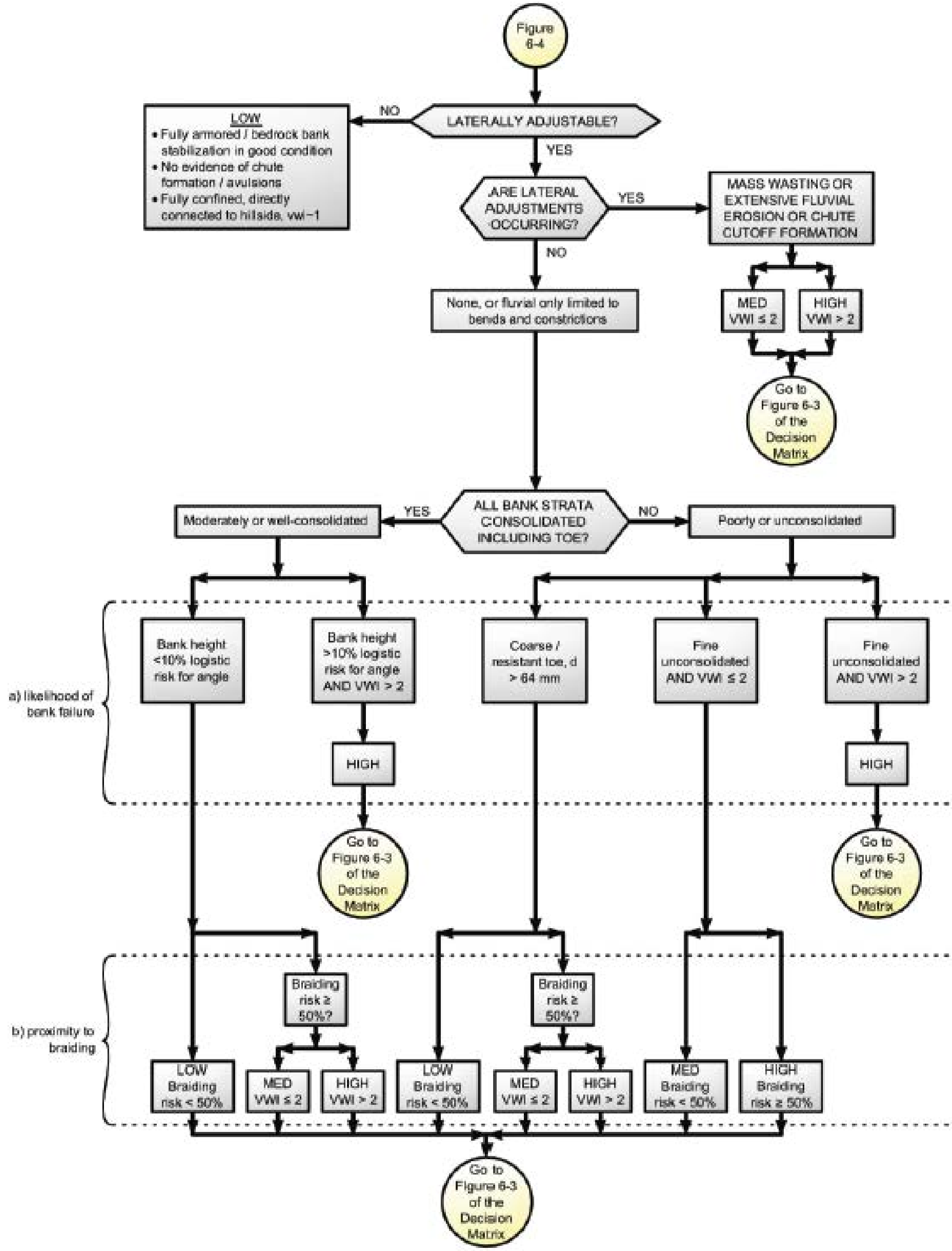
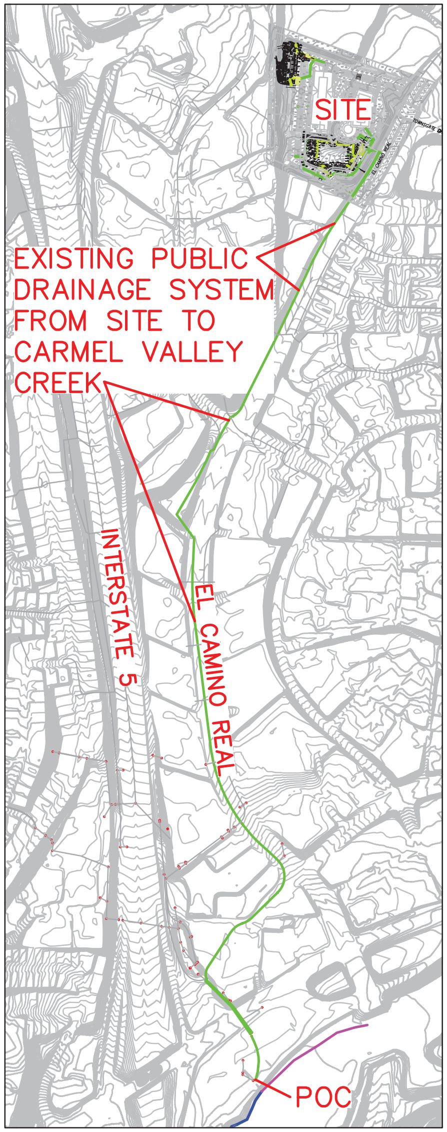


Figure 6-5. Lateral Channel Susceptibility

Figure 13. SCCWRP Lateral Channel Susceptibility Matrix

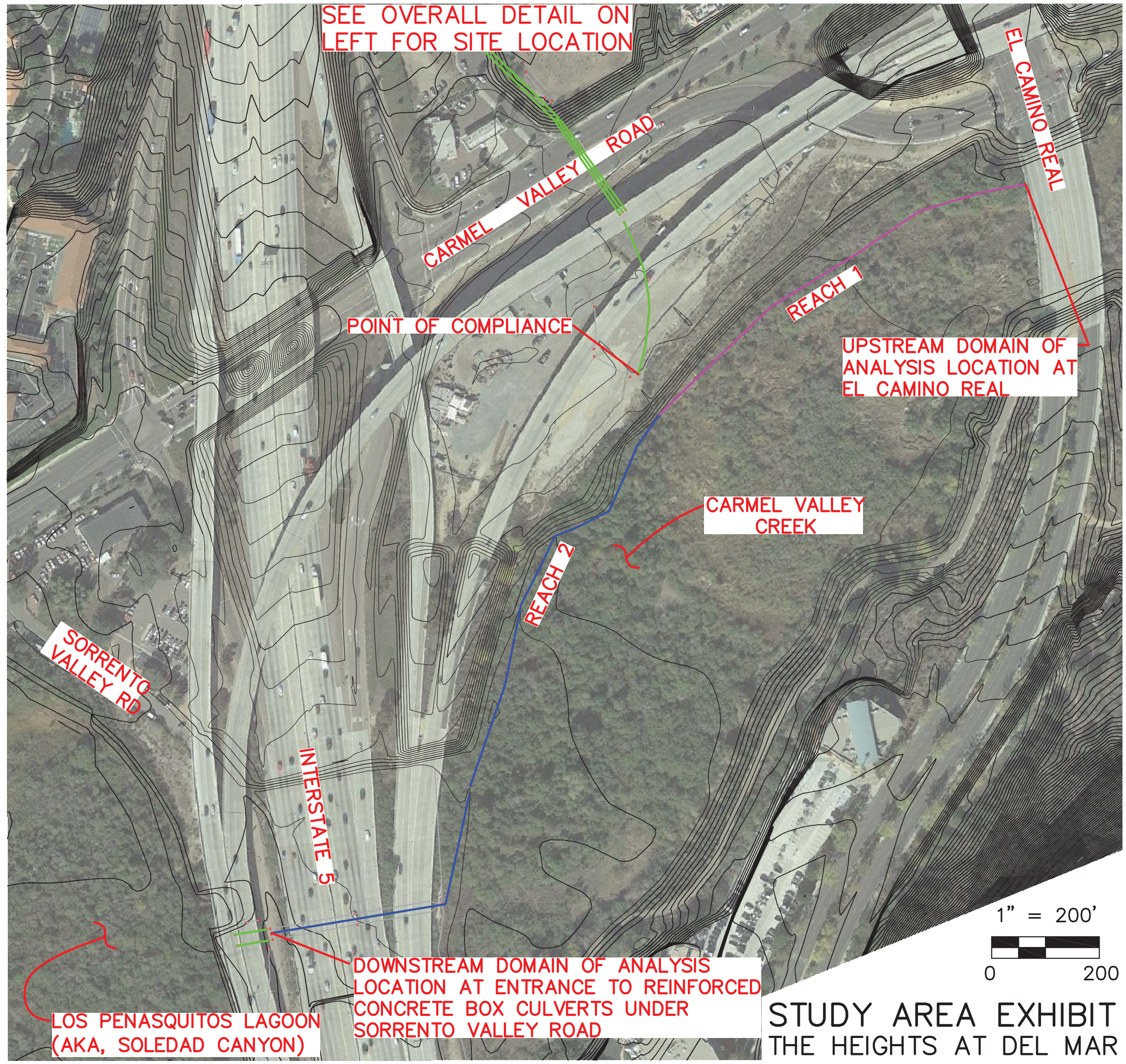


1" = 800'

0 800

OVERALL DETAIL

NOTE:
EXISTING DRAINAGE FACILITIES IN GREEN. STUDY REACHES IN BLUE AND MAGENTA.



1" = 200'

0 200

STUDY AREA EXHIBIT

THE HEIGHTS AT DEL MAR

APPENDIX A

SCCWRP INITIAL DESKTOP ANALYSIS

FORM 1: INITIAL DESKTOP ANALYSIS

Complete all shaded sections.

IF required at multiple locations, circle one of the following site types:

Applicant Site / Upstream Extent / Downstream Extent

Location: Latitude: 32.9320 Longitude: -117.2386

Description (river name, crossing streets, etc.): The Heights at Del Mar Project

GIS Parameters: The International System of Units (SI) is used throughout the assessment as the field standard and for consistency with the broader scientific community. However, as the singular exception, US Customary units are used for contributing drainage area (A) and mean annual precipitation (P) to apply regional flow equations after the USGS. See SCCWRP Technical Report 607 for example measurements and "Screening Tool Data Entry.xls" for automated calculations.

Form 1 Table 1. Initial desktop analysis in GIS.

	Symbol	Variable	Description and Source	Value
Watershed properties (English units)	**A**	Area (mi^2)	Contributing drainage area to screening location via published Hydrologic Unit Codes (HUCs) and/or ≤ 30 m National Elevation Data (NED), USGS seamless server	See attached Form 1 table on next page for calculated values for study reach.
	P	Mean annual precipitation (in)	Area-weighted annual precipitation via USGS delineated polygons using records from 1900 to 1960 (which was more significant in hydrologic models than polygons delineated from shorter record lengths)	
Site properties (SI units)	**S_v**	Valley slope (m/m)	Valley slope at site via NED, measured over a relatively homogenous valley segment as dictated by hillslope configuration, tributary confluences, etc., over a distance of up to ~500 m or 10% of the main-channel length from site to drainage divide	
	W_v	Valley width (m)	Valley bottom width at site between natural valley walls as dictated by clear breaks in hillslope on NED raster, irrespective of potential armoring from floodplain encroachment, levees, etc. (imprecise measurements have negligible effect on rating in wide valleys where VWI is >> 2, as defined in lateral decision tree)	

Form 1 Tabl e 2. Simplif ied peak flo w, screening index, and valley width index. Values for this table should be calculated in the sequence shown in this table, using values from Form 1 Table 1.

Symbol	Dependent Variable	Equation	Required Units	Value
Q_{10cfs}	10-yr peak flow (ft^3/s)	$Q_{10cfs} = 18.2 * A^{0.87} * P^{0.77}$	A (mi^2) P (in)	See attached Form 1 table on next page for calculated values for study reach.
Q_{10}	10-yr peak flow (m^3/s)	$Q_{10} = 0.0283 * Q_{10cfs}$	Q_{10cfs} (ft^3/s)	
INDEX	10-yr screening index ($m^{1.5}/s^{0.5}$)	$INDEX = S_v*Q_{10}^{0.5}$	Sv (m/m) Q_{10} (m^3/s)	
W_{ref}	Reference width (m)	$W_{ref} = 6.99 * Q_{10}^{0.438}$	Q_{10} (m^3/s)	
VWI	Valley width index (m/m)	$VWI = W_v/W_{ref}$	W_v (m) W_{ref} (m)	

(Sheet 1 of 1)

SCCWRP FORM 1 ANALYSES

Reach	Area A, sq. mi.	Mean Annual Precip. P, inches	Valley Slope Sv, m/m	Valley Width Wv, m	10-Year Flow Q10cfs, cfs	10-Year Flow Q10, cms
1	15.70	9.66	0.0027	32.0	1145	32.41
2	15.70	9.66	0.0059	59.4	1145	32.41

Reach	10-Year Screening Index INDEX	Reference Width Wref, m	Valley Width Index VWI, m/m
1	0.0153	32.1	1.00
2	0.0339	32.1	1.85

TABLE 8: SUMMARY OF PEAK DISCHARGES

Flooding Source and Location	Drainage Area (sq. miles)	Peak Discharges (cubic feet per second) 10% Annual-Chance	2% Annual-Chance	1% Annual-Chance	0.2% Annual-Chance
Buena Vista Creek Tributary 2					
At Confluence with Buena Vista Creek	0.8	110	410	530	700
At Intersection of Eucalyptus Avenue and Tiger Tail Road	0.5	110	280	360	480
Buena Vista Creek Tributary 3					
At Confluence with Buena Vista Creek	4.7	--	--	1,880	3,500
Buena Vista Creek Tributary 4					
At Confluence with Buena Vista Creek	2.5	570	1,210	1,450	1,860
Calavera Creek					
Upstream of Rancho Carlsbad Mobile Home Park	4.5	--	--	500	--
Confluence with Agua Hedionda Creek	5.8	--	--	910	--
Carmel Valley Creek					
Above Confluence with Soledad Canyon	15.7	2,100	6,500	9,800	21,300
Below Confluence with Shaw Valley Creek	11.0	1,400	4,200	6,300	13,700
Carroll Canyon Creek					

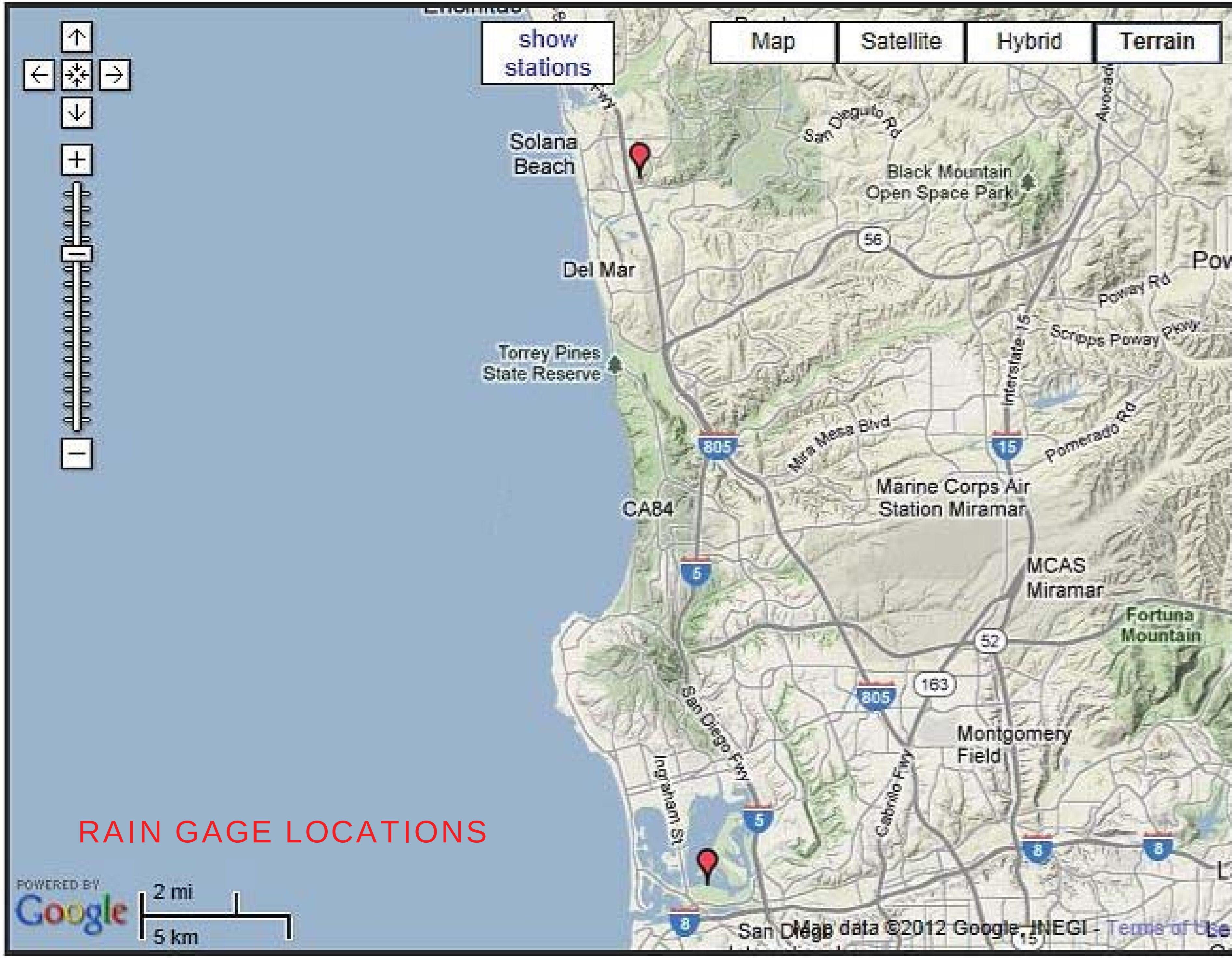
-- Data Not Available

TABLE 8: SUMMARY OF PEAK DISCHARGES

Flooding Source and Location	Drainage Area (sq. miles)	Peak Discharges (cubic feet per second)			
		10% Annual-Chance	2% Annual-Chance	1% Annual-Chance	0.2% Annual-Chance
Upstream of Las Posas Culvert Entrance	--	750	1,200	1,850	2,350
Las Puleta Creek					
At San Diego and Arizona Eastern Railroad	2.8	550	1,200	1,400	2,500
Downstream of Confluence with Logan Avenue Branch	1.5	300	730	870	1,690
At 47th Street	0.8	160	390	470	910
0.6 Mile Upstream of Cervantes Avenue	0.1	20	50	60	120
Lawson Valley Creek					
Approximately 7,200 Feet Upstream of Mouth	10.2	--	--	9,000	--
Loma Alta Creek					
At Mouth	9.1	800	2,500	3,800	8,200
Downstream of El Camino Real	4.7	450	1,500	2,200	4,800
Upstream of El Camino Real	2.9	350	1,100	1,700	3,700
Los Penasquitos Creek					
Above Confluence with Soledad Canyon	58.3	3,700	11,300	16,800	37,600

-- Data Not Available

Western US COOP Station Map



LOCKWOOD MESA, CALIFORNIA (045023)

Period of Record Monthly Climate Summary

Period of Record : 9/ 1/1940 to 7/31/1965

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)					Insuff	icient	Data						
Average Min. Temperature (F)					Insuff	icient	Data						
Average Total Precipitation (in.)	1.84	1.43	1.65	1.06	0.29	0.05	0.01	0.08	0.19	0.45	0.95	1.65	9.66
Average Total SnowFall (in.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record.
Max. Temp.: 0% Min. Temp.: 0% Precipitation: 97.5% Snowfall: 97.5% Snow Depth: 97.5%
Check Station Metadata or Metadata graphics for more detail about data completeness.

Western Regional Climate Center, *wrcc@dri.edu*

SAN DIEGO SEAWORLD, CALIFORNIA (047741)

Period of Record Monthly Climate Summary

Period of Record : 5/ 1/1999 to 1/31/2012

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	63.0	63.8	65.2	65.4	67.4	68.9	72.2	72.7	71.5	69.0	66.1	62.7	67.3
Average Min. Temperature (F)	48.7	50.1	53.6	54.1	57.7	60.9	64.5	65.3	63.6	58.8	52.8	47.9	56.5
Average Total Precipitation (in.)	2.02	3.14	0.52	0.69	0.20	0.01	0.00	0.00	0.08	0.94	0.79	1.24	9.63
Average Total SnowFall (in.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record.
Max. Temp.: 92.3% Min. Temp.: 89.8% Precipitation: 99.8% Snowfall: 100% Snow Depth: 99.6%
Check Station Metadata or Metadata graphics for more detail about data completeness.

Western Regional Climate Center, wrcc@dri.edu

APPENDIX B

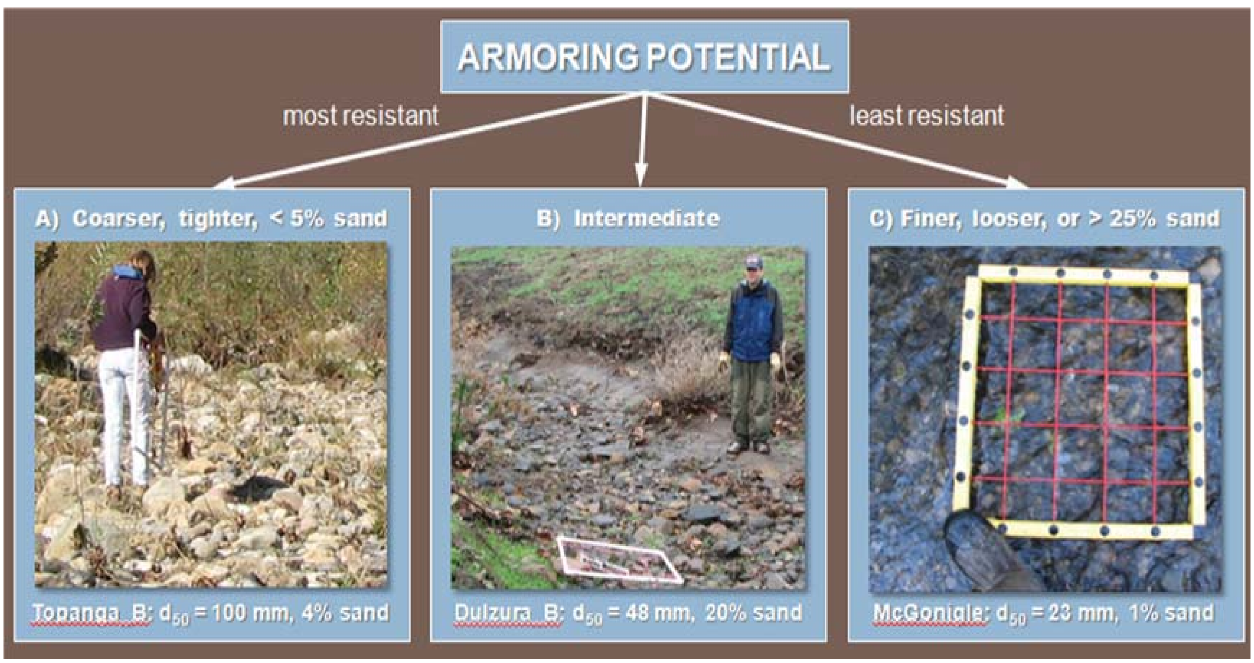
SCCWRP FIELD SCREENING DATA

Form 3 Support Materials

Form 3 Checklists 1 and 2, along with information recording in Form 3 Table 1, are intended to support the decisions pathways illustrated in Form 3 Overall Vertical Rating for Intermediate/Transitional Bed.

Form 3 Checklist 1: Armoring Potential

□	A	A mix of coarse gravels and cobbles that are tightly packed with <5% surface material of diameter <2 mm
X	B	Intermediate to A and C or hardpan of unknown resistance, spatial extent (longitudinal and depth), or unknown armoring potential due to surface veneer covering gravel or coarser layer encountered with probe
□	C	Gravels/cobbles that are loosely packed or >25% surface material of diameter <2 mm



Form 3 Figure 2. Armoring potential photographic supplement for assessing intermediate beds (16 < d_{50} < 128 mm) to be used i**n conjunction with Form 3 Checklist 1.**

(Sheet 2 of 4)

REACH 1 AND 2 RESULTS

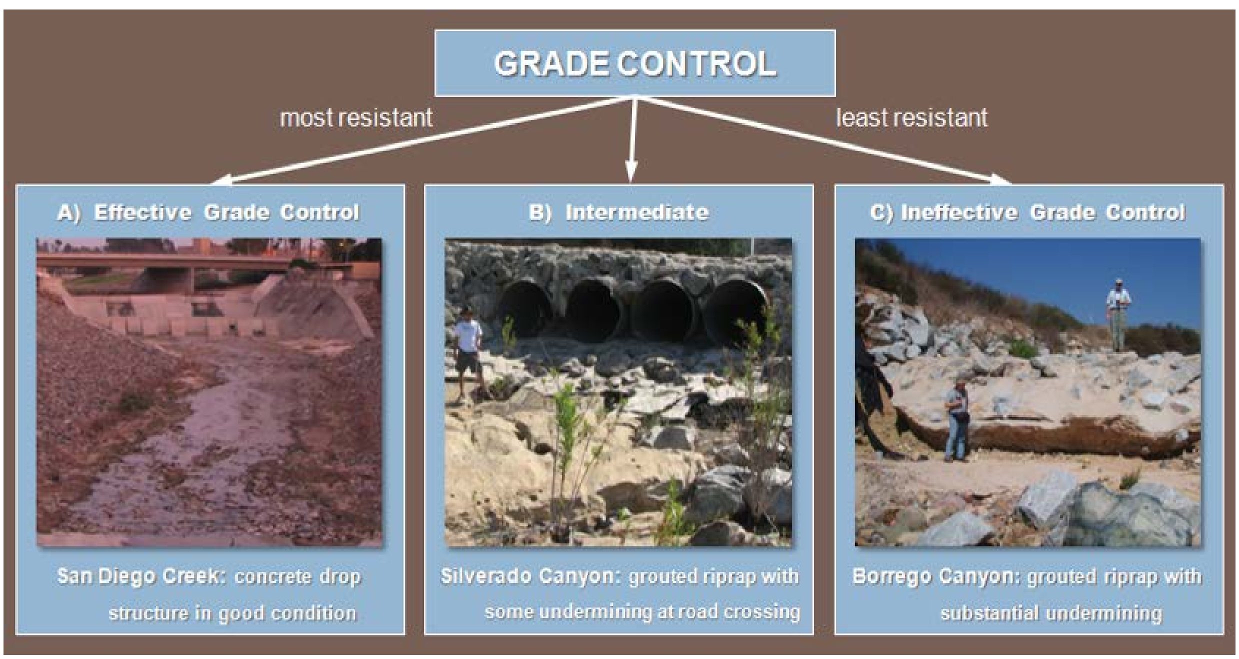
Form 3 Checklist 2: Grade Control

X A Grade control is present with spacing <50 m or $2/S_v$ m

- No evidence of failure/ineffectiveness, e.g., no headcutting (>30 cm), no active mass wasting (analyst cannot say grade control sufficient if mass-wasting checklist indicates presence of bank failure), no exposed bridge pilings, no culverts/structures undermined
- Hard points in serviceable condition at decadal time scale, e.g., no apparent undermining, flanking, failing grout
- If geologic grade control, rock should be resistant igneous and/or metamorphic; For sedimentary/hardpan to be classified as 'grade control', it should be of demonstrable strength as indicated by field testing such as hammer test/borings and/or inspected by appropriate stakeholder

□ B Intermediate to A and C – artificial or geologic grade control present but spaced 2/Sv m to 4/Sv m or potential evidence of failure or hardpan of uncertain resistance

□ C Grade control absent, spaced >100 m or >$4/S_v$ m, or clear evidence of ineffectiveness



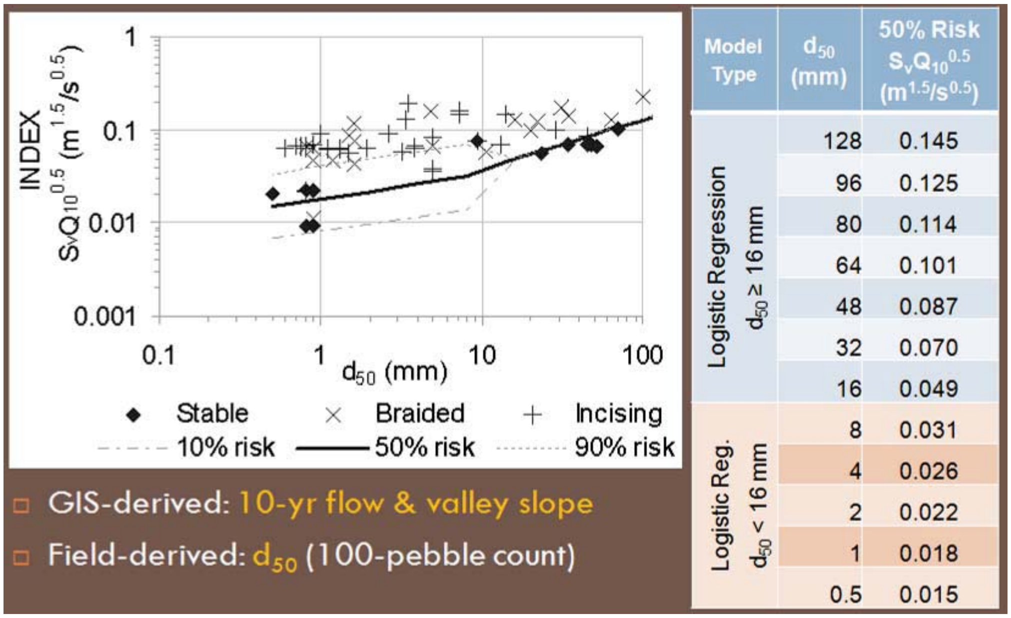
Form 3 Figure 3. Grade-control (condition) photographic supplement for assessing intermediate beds (16 < d_{50} < 128 mm) to be used in conjunction with Form 3 Checklist 2.

(Sheet 3 of 4)

REACH 1 AND 2 RESULTS

Regionally-Calibrated Screening Index Threshold for Incising/Braiding

For transitional bed channels (d_{50} between 16 and 128 mm) or labile beds (channel not incised past critical bank height), use Form 3 Figure 3 to determine Screening Index Score and complete Form 3 Table 1.



22.6 mm = 0.058

Form 3 Figure 4. Probability of incising/braiding based on logistic regression of Screening Index and d_{50} to be used in conjunction with Form 3 Table 1.

Form 3 Table 1. Values for Screening Index Threshold (probability of incising/braiding) to be used in conjunction with Form 3 Figure 4 (above) to complete Form 3 Overall Vertical Rating for Intermediate/Transitional Bed (below).. Screening Index Score: A = <50% probability of incision for current Q_{10}, valley slope, and d_{50}; B = Hardpan/d_{50} indeterminate; and C = $\geq$50% probability of incising/braiding for current Q_{10}, valley slope, and d_{50}.

d_{50} (mm) *From Form 2*	**S_v*$Q_{10}^{0.5}$ ($m^{1.5}/s^{0.5}$)** *From Form 1*	**S_v*$Q_{10}^{0.5}$ ($m^{1.5}/s^{0.5}$)** *50% risk of incising/braiding from table in Form 3 Figure 3 above*	**Screening Index Score (A, B, C)**

Overall Vertical Rating for Intermediate/Transitional Bed

Calculate the overall Vertical Rating for Transitional Bed channels using the formula below. Numeric values for responses to Form 3 Checklists and Table 1 as follows: A = 3, B = 6, C = 9.

$$Vertical\ Rating = \sqrt{\{(\sqrt{armoring * grade\ control}) * screening\ index\ score\}}$$

6 x 3 x 3 = 3.6

Vertical Susceptibility based on Vertical Rating: <4.5 = LOW; 4.5 to 7 = MEDIUM; and >7 = HIGH.

(Sheet 4 of 4)

REACH 1 AND 2 RESULTS

PEBBLE COUNT

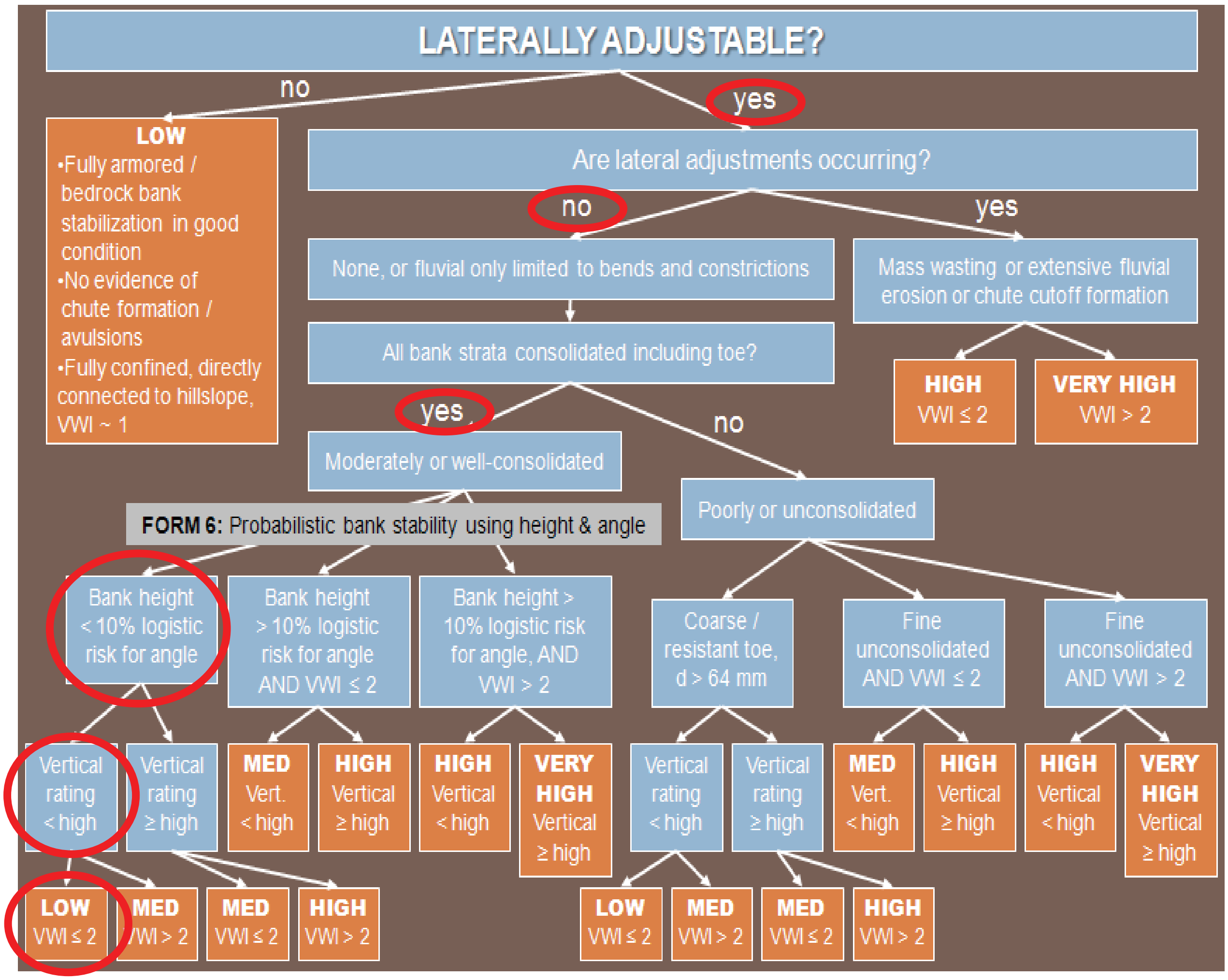
#	Reach 1 Diameter, mm	Reach 2 Diameter, mm
1	4	4
2	4	4
3	5.6	5.6
4	5.6	5.6
5	5.6	5.6
6	8	5.6
7	8	8
8	8	8
9	8	8
10	8	8
11	8	11
12	11	11
13	11	11
14	11	11
15	11	11
16	11	11
17	11	11
18	11	11
19	16	11
20	16	11
21	16	11
22	16	11
23	16	11
24	16	16
25	16	16
26	16	16
27	16	16
28	16	16
29	16	16
30	16	16
31	16	16
32	22.6	16
33	22.6	16
34	22.6	16
35	22.6	16
36	22.6	16
37	22.6	16
38	22.6	16
39	22.6	16
40	22.6	16
41	22.6	22.6
42	22.6	22.6
43	22.6	22.6
44	22.6	22.6

#	Reach 1 Diameter, mm	Reach 2 Diameter, mm	
45	22.6	22.6	
46	22.6	22.6	
47	22.6	22.6	
48	22.6	22.6	
49	22.6	22.6	
50	22.6	22.6	D50
51	22.6	22.6	
52	22.6	22.6	
53	22.6	22.6	
54	22.6	22.6	
55	32	22.6	
56	32	22.6	
57	32	22.6	
58	32	22.6	
59	32	22.6	
60	32	32	
61	32	32	
62	32	32	
63	32	32	
64	32	32	
65	32	32	
66	32	32	
67	32	32	
68	32	32	
69	32	32	
70	32	32	
71	32	32	
72	32	32	
73	32	32	
74	32	32	
75	32	32	
76	45	32	
77	45	32	
78	45	32	
79	45	32	
80	45	32	
81	45	32	
82	45	32	
83	45	32	
84	45	32	
85	45	45	
86	45	45	
87	45	45	
88	45	45	
89	45	45	
90	45	45	

#	Reach 1 Diameter, mm	Reach 2 Diameter, mm
91	45	45
92	45	45
93	45	45
94	45	45
95	45	45
96	45	45
97	64	45
98	64	64
99	64	64
100	64	90

FORM 4: LATERAL SUSCEPTIBILTY FIELD SHEET

Circle appropriate nodes/pathway for proposed site
OR use sequence of questions provided in Form 5.



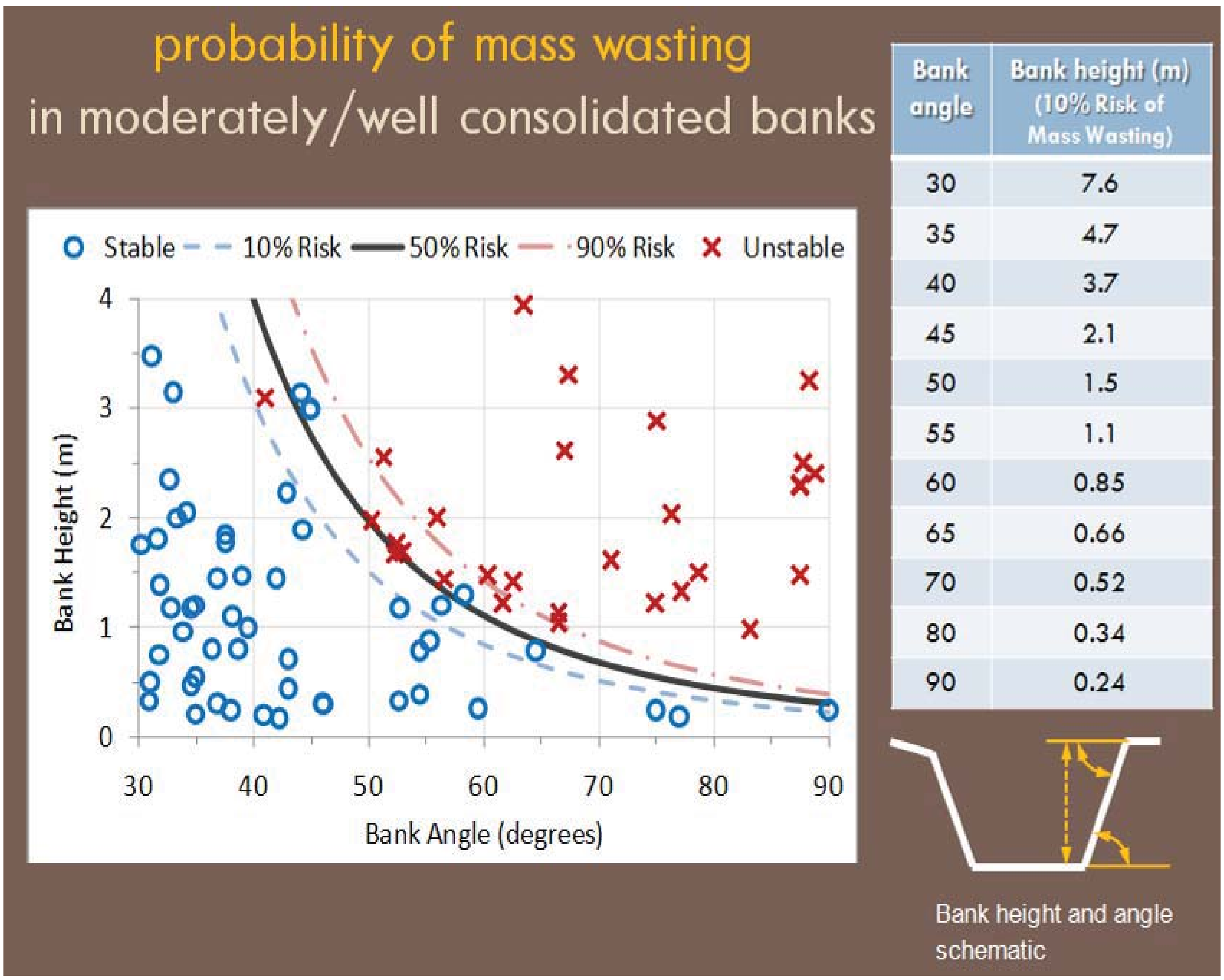
(Sheet 1 of 1)

REACH 1 AND 2 RESULTS

FORM 6: PROBABILITY OF MASS WASTING BANK FAILURE

If mass wasting is not currently extensive and the banks are moderately- to well-consolidated, measure bank height and angle at several locations (i.e., at least three locations that capture the range of conditions present in the study reach) to estimate representative values for the reach. Use Form 6 Figure 1 below to determine if risk of bank failure is >10% and complete Form 6 Table 1. Support your results with photographs that include a protractor/rod/tape/person for scale.

	Bank Angle (degrees) *(from Field)*	**Bank Height (m)** *(from Field)*	**Corresponding Bank Height for 10% Risk of Mass Wasting (m)** *(from Form 6 Figure 1 below)*	**Bank Failure Risk** *(<10% Risk)* *(>10% Risk)*
Left Bank	<26.6 (2:1)	---	---	<10%
Right Bank	<26.6 (2:1)	---	---	<10%



Form 6 Figure 1. Probability Mass Wasting diagram, Bank Angle:Height/% Risk table, and Band Height:Angle schematic.

(Sheet 1 of 1)

REACH 1 AND 2 RESULTS

uKnow San Diego BMP Sizing Calculator (v3.0)

Home Contacts Legal Logout

Find

Map data provided by OpenStreetMap

Map Details

Result View

CRITICAL STRESS CALCULATOR RESULTS FOR REACH 1

Define Drainage Basins

Basin: Carmel Valley Creek

Project: The Heights at Del Mar

Start | Project | Basin | POC | Export

Manage Your Point of Compliance (POC)

Analyze the receiving water at the 'Point of Compliance' by completing this form. Click Edit and enter the appropriate fields, then click the Update button to calculate the critical flow and low-flow threshold condition. Finally, click Save to commit the changes.

Channel Susceptibility: LOW

Low Flow Threshold: 0.5Q2

Cancel Save Update

Channel Assessed: Yes

Watershed Area (ac): 10048.00

Vertical Susceptibility: Low (Vertical)

Lateral Susceptibility: Low (Lateral)

Material: Vegetation

Roughness: 0.100

Channel Top Width (ft): 460.0

Channel Bottom Width (ft): 105.0

Channel Height (ft): 10.0

Channel Slope: 0.0027

Large View

uKnow San Diego BMP Sizing Calculator (v3.0) Home Contacts Legal Logout

Find

Map data provided by OpenStreetMap

Map Details

Result View

CRITICAL STRESS CALCULATOR RESULTS FOR REACH 2

Define Drainage Basins

Basin: Carmel Valley Creek   Project: The Heights at Del Mar

Start | Project | Basin | POC | Export

Manage Your Point of Compliance (POC)

Analyze the receiving water at the 'Point of Compliance' by completing this form. Click Edit and enter the appropriate fields, then click the Update button to calculate the critical flow and low-flow threshold condition. Finally, click Save to commit the changes.

Cancel Save Update

Channel Susceptibility: LOW

Low Flow Threshold: 0.5Q2

Channel Assessed: Yes

Watershed Area (ac): 10048.00

Vertical Susceptibility: Low (Vertical)

Lateral Susceptibility: Low (Lateral)

Material: Vegetation

Roughness: 0.100

Channel Top Width (ft): 580.0

Channel Bottom Width (ft): 195.0

Channel Height (ft): 10.0

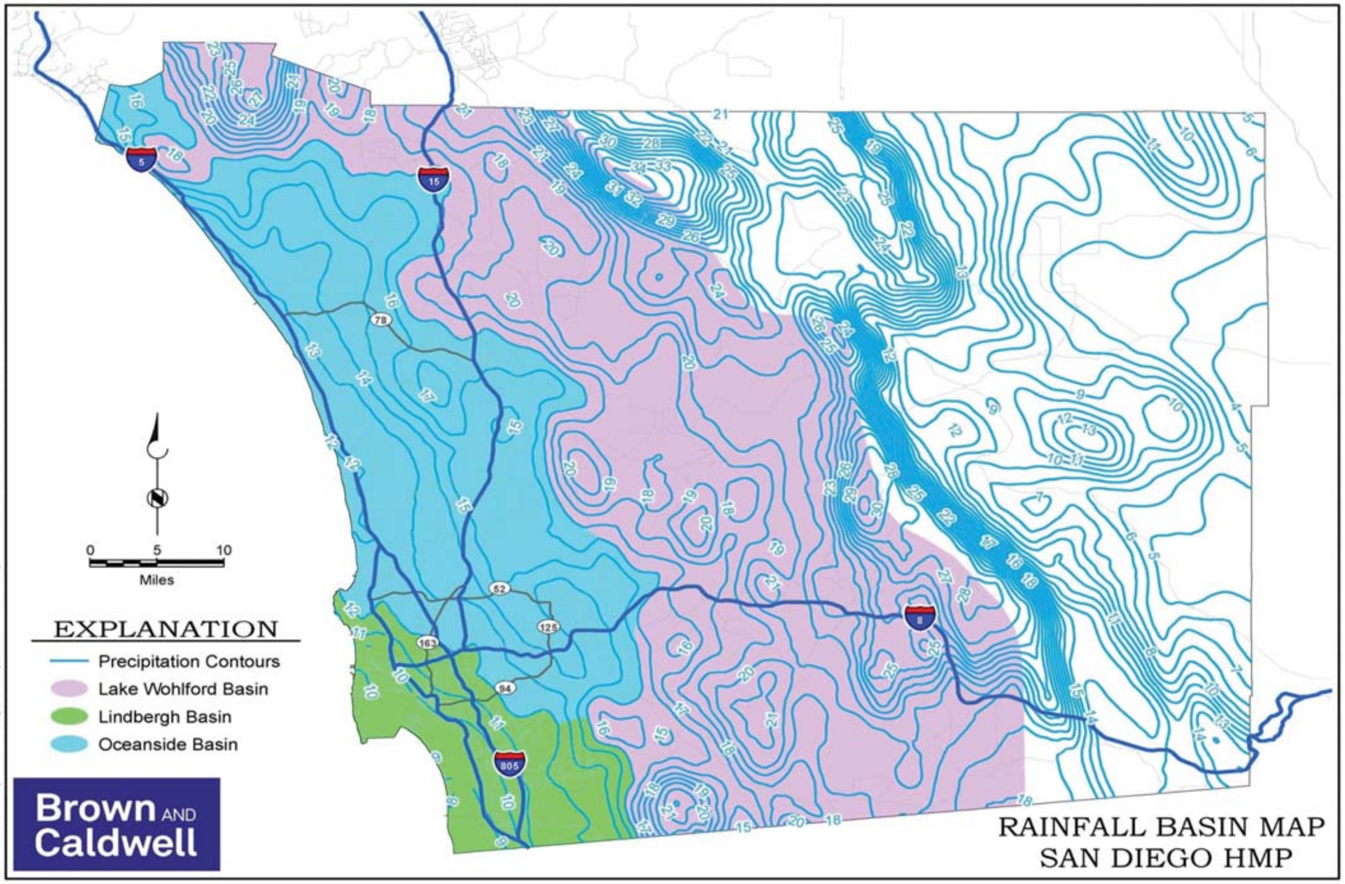
Channel Slope: 0.0059

Large View

APPENDIX XIV – Brown and Caldwell HMP Sizing Spreadsheet

BMP Sizing Spreadsheet V1.04

Project Name:	One Paseo
Project Applicant:	Kilroy
Jurisdiction:	City of San Diego
Parcel (APN):	645-040-66-00, 645-040-70-00
Hydrologic Unit:	Penasquitos
Rain Gauge:	Oceanside
Total Project Area (sf):	1031746
Channel Susceptibility:	Low



File Name: P:\Projects\San Diego County\139942 - HMP Implementation Assistance\GIS\HMF GIS\Basins.mxd

BMP Sizing Spreadsheet V1.04			
Project Name:	One Paseo	Hydrologic Unit:	Penasquitos
Project Applicant:	Kilroy	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	1031746
Parcel (APN):	645-040-66-00, 645-040-70-00	Low Flow Threshold:	0.5Q2
BMP Name:	Modular Wetlands	BMP Type:	Bioretention Plus Cistern
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.024

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (Table 4-2)	Bioretention Surface Area	Cistern Volume	N/A	Bioretention Surface Area (sf)	Cistern Volume (cf)	N/A
DMA-1 Pervious	134781	D	Flat	Landscape	0.1	0.035	0.12	N/A	472	1617	N/A
DMA-1 Impervious	486474	D	Flat	PCC	1.0	0.035	0.12	N/A	17027	58377	N/A
Total BMP Area	621255							Minimum BMP Size	17498.3235	59994	
								Proposed BMP Size*		N/A	N/A
											in
								Minimum Cistern Depth		N/A	in
								Maximum Cistern Depth		N/A	in
								Selected Cistern Depth		118.00	in
								Selected Cistern Volume		60000	cubic feet

Describe the BMP's in sufficient detail in your SWMP 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 Sizing Calculator has been developed in compliance with the Countywide Model SUSMP. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V1.04			
Project Name:	One Paseo	Hydrologic Unit:	Penasquitos
Project Applicant:	Kilroy	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	1031746
Parcel (APN):	5-040-66-00, 645-040-70	Low Flow Threshold:	0.5Q2
BMP Name	Modular Wetlands	BMP Type:	Bioretention Plus Cistern

DMA Name	Rain Gauge	Existing Condition			Q2 Sizing Factor (cfs/ac)	DMA Area (ac)	Orifice Flow - $\%Q_2$ (cfs)	**Orifice Area (in2)**
		Soil Type	Cover	Slope				
DMA-1 Pervious	Oceanside	D	Scrub	Moderate	0.212	3.094	0.328	**3.34**
DMA-1 Impervious	Oceanside	D	Scrub	Moderate	0.212	11.168	1.184	**12.07**

1.512	**15.41**	**4.43**
Tot. Allowable Orifice Flow (cfs)	**Tot. Allowable Orifice Area (in2)**	**Max Orifice Diameter (in)**

1.487	**14.19**	**4.25**
Actual Orifice Flow (cfs)	Actual Orifice Area (in2)	Selected Orifice Diameter (in)

Drawdown (Hrs)	22.4

BMP Sizing Spreadsheet V1.04			
Project Name:	One Paseo	Hydrologic Unit:	Penasquitos
Project Applicant:	Kilroy	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	1031746
Parcel (APN):	645-040-66-00, 645-040-70-00	Low Flow Threshold:	0.5Q2
BMP Name:	Modular Wetlands	BMP Type:	Bioretention Plus Cistern
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.024

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (Table 4-2)	Bioretention Surface Area	Cistern Volume	N/A	Bioretention Surface Area (sf)	Cistern Volume (cf)	N/A
DMA 3 - Pervious	54523	D	Flat	Landscape	0.1	0.035	0.12	N/A	191	654	N/A
DMA-3 - Impervious	159127	D	Flat	PCC	1.0	0.035	0.12	N/A	5569	19095	N/A
Total BMP Area	213650							Minimum BMP Size	5760.2755	19750	
								Proposed BMP Size*		N/A	N/A
											in
								Minimum Cistern Depth		N/A	in
								Maximum Cistern Depth		N/A	in
								Selected Cistern Depth		50.00	in
								Selected Cistern Volume		19750	cubic feet

Describe the BMP's in sufficient detail in your SWMP 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 Sizing Calculator has been developed in compliance with the Countywide Model SUSMP. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V1.04			
Project Name:	One Paseo	Hydrologic Unit:	Penasquitos
Project Applicant:	Kilroy	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	1031746
Parcel (APN):	5-040-66-00, 645-040-70	Low Flow Threshold:	0.5Q2
BMP Name	Modular Wetlands	BMP Type:	Bioretention Plus Cistern

DMA Name	Rain Gauge	Existing Condition			Q2 Sizing Factor (cfs/ac)	DMA Area (ac)	Orifice Flow - $\%Q_2$ (cfs)	**Orifice Area (in2)**
		Soil Type	Cover	Slope				
DMA 3 - Pervious	Oceanside	D	Scrub	Moderate	0.212	1.252	0.133	**2.08**
DMA-3 - Impervious	Oceanside	D	Scrub	Moderate	0.212	3.653	0.387	**6.07**

0.520	**8.14**	**3.22**
Tot. Allowable Orifice Flow (cfs)	**Tot. Allowable Orifice Area (in2)**	**Max Orifice Diameter (in)**

0.518	**7.60**	**3.11**
Actual Orifice Flow (cfs)	Actual Orifice Area (in2)	Selected Orifice Diameter (in)

Drawdown (Hrs)	21.2

BMP Sizing Spreadsheet V1.04			
Project Name:	One Paseo	Hydrologic Unit:	Penasquitos
Project Applicant:	Kilroy	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	1031746
Parcel (APN):	645-040-66-00, 645-040-70-00	Low Flow Threshold:	0.5Q2
BMP Name:	Modular Wetland	BMP Type:	Bioretention Plus Cistern
BMP Native Soil Type:	D	BMP Infiltration Rate (in/hr):	0.024

Areas Draining to BMP						HMP Sizing Factors			Minimum BMP Size		
DMA Name	Area (sf)	Soil Type	Slope	Post Project Surface Type	Runoff Factor (Table 4-2)	Bioretention Surface Area	Cistern Volume	N/A	Bioretention Surface Area (sf)	Cistern Volume (cf)	N/A
DMA-4 - Pervious	40303	D	Flat	Landscape	0.1	0.035	0.12	N/A	141	484	N/A
DMA-4 - Impervious	156538	D	Flat	PCC	1.0	0.035	0.12	N/A	5479	18785	N/A
Total BMP Area	196841							Minimum BMP Size	5619.8905	19268	
								Proposed BMP Size*		N/A	N/A
											in
								Minimum Cistern Depth		N/A	in
								Maximum Cistern Depth		N/A	in
								Selected Cistern Depth		50.00	in
								Selected Cistern Volume		19300	cubic feet

Describe the BMP's in sufficient detail in your SWMP 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 Sizing Calculator has been developed in compliance with the Countywide Model SUSMP. For questions or concerns please contact the jurisdiction in which your project is located.

BMP Sizing Spreadsheet V1.04			
Project Name:	One Paseo	Hydrologic Unit:	Penasquitos
Project Applicant:	Kilroy	Rain Gauge:	Oceanside
Jurisdiction:	City of San Diego	Total Project Area:	1031746
Parcel (APN):	-040-66-00, 645-040-70	Low Flow Threshold:	0.5Q2
BMP Name	Modular Wetland	BMP Type:	Bioretention Plus Cistern

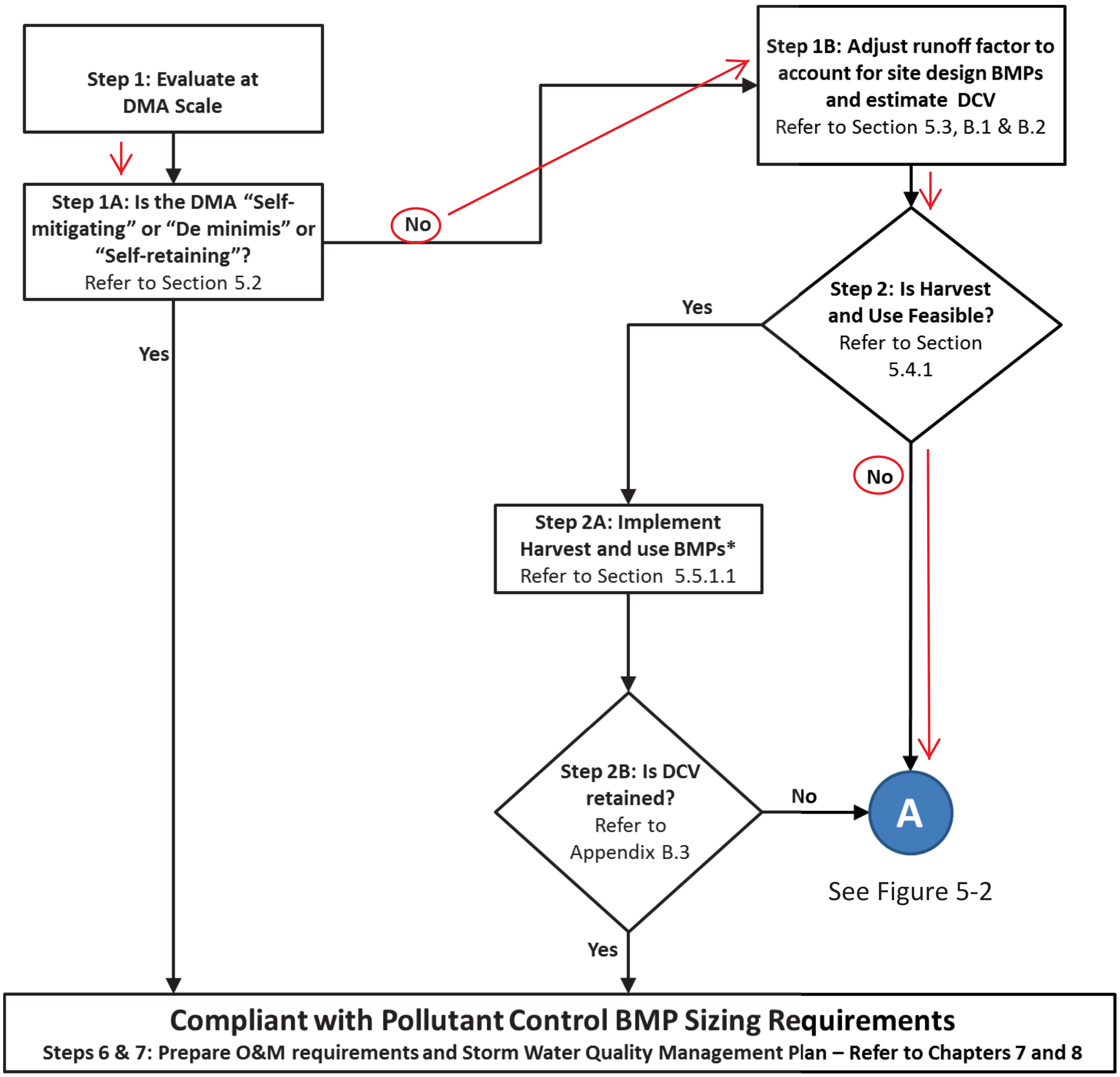
DMA Name	Rain Gauge	Existing Condition			Q2 Sizing Factor (cfs/ac)	DMA Area (ac)	Orifice Flow - $\%Q_2$ (cfs)	**Orifice Area (in2)**
		Soil Type	Cover	Slope				
DMA-4 - Pervious	Oceanside	D	Scrub	Moderate	0.212	0.925	0.098	**1.54**
DMA-4 - Impervious	Oceanside	D	Scrub	Moderate	0.212	3.594	0.381	**5.97**

0.479	**7.50**	**3.09**
Tot. Allowable Orifice Flow (cfs)	**Tot. Allowable Orifice Area (in2)**	**Max Orifice Diameter (in)**

0.479	**7.02**	**2.99**
Actual Orifice Flow (cfs)	Actual Orifice Area (in2)	Selected Orifice Diameter (in)

Drawdown (Hrs)	22.4

APPENDIX XV – Storm Water Pollutant Control BMP Selection Flow Chart



* Step 2C: Project applicant has an option to also conduct feasibility analysis for infiltration and if infiltration is fully or partially feasible has an option to choose between infiltration and harvest and use BMPs. But if infiltration is not feasible and harvest and use is feasible, project applicant must implement harvest and use BMPs

FIGURE 5-1. Storm Water Pollutant Control BMP Selection Flow Chart

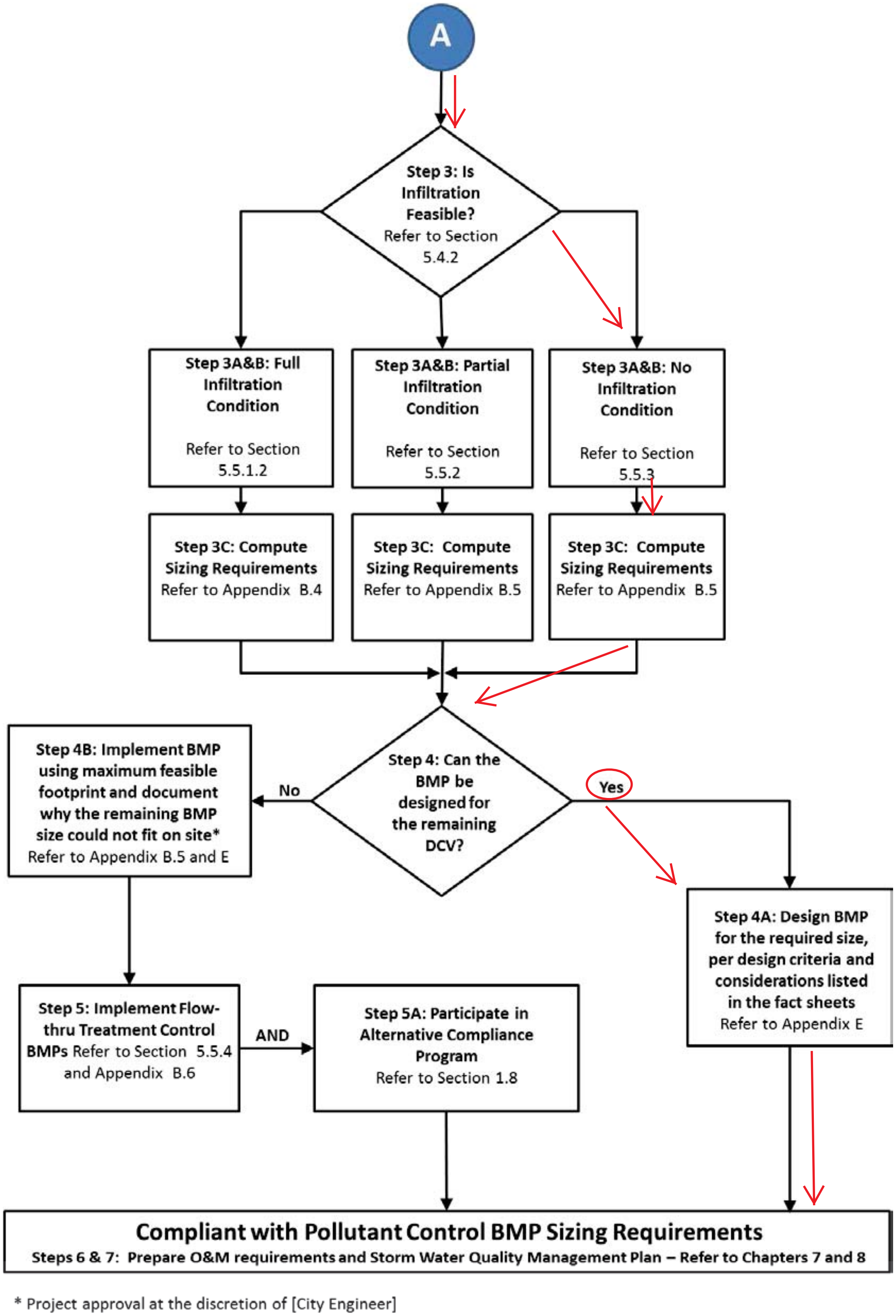


FIGURE 5-2. Storm Water Pollutant Control BMP Selection Flow Chart

APPENDIX XVI – Design Capture Volume Calculation

Worksheet B.2-1. DCV

	Design Capture Volume	Worksheet B-2.1		
1	85th percentile 24-hr storm depth from Figure B.1-1	d=	.5	inches
2	Area tributary to BMP (s)	A=	23.68	acres
3	Area weighted runoff factor (estimate using Appendix B.1.1 and B.2.1)	C=	.77	unitless
4	Street trees volume reduction	TCV=	0	cubic-feet
5	Rain barrels volume reduction	RCV=	0	cubic-feet
6	Calculate DCV = (3630 x C x d x A) – TCV - RCV	DCV=	33,094	cubic-feet

JOB ONE PASEO
SHEET NO. ________ OF ________ REV. ________
CALCULATED BY ________ DATE ________
CHECKED BY ________ DATE ________
SCALE ________

DESIGN CAPTURE VOLUME CALCULATIONS:

BASED ON WORKSHEET B.2-1

(1) 85TH PECENTILE 24 HR STORM DEPTH

- SEE FIGURE B.1-1

(2) AREA TRIBUTARY TO BMP(S)

- SEE SITE PLAN

(3) AREA WEIGHTED RUNOFF FACTOR (FACTORS FROM TABLE B.1-1)

SURFACE	AREA (AC)	FACTOR
ROOF & CONCRETE OR ASPHALT	18.41	.9
AMENDED, MULCHED SOILS, OR LANDSCAPE	5.27	.3

$$C = \frac{\Sigma C_x A_x}{\Sigma A_x} = \frac{(18.41 \times .9) + (5.27 \times .3)}{(18.41 + 5.27)} = .77$$

(4) STREET TREES VOLUME REDUCTION

- NONE TAKEN ∴ Ø

(5) RAIN BARRELS VOLUME REDUCTION

- NO RAIN BARRELS PROPOSED ∴ Ø

(6) CALCULATE DCV

$$DCV = (3630 \times C \times d \times A) - TCV - RCV$$

$$= (3630 \times .77 \times .5 \times 23.68) - 0 - 0$$

$$= 33{,}094 \text{ CF}$$

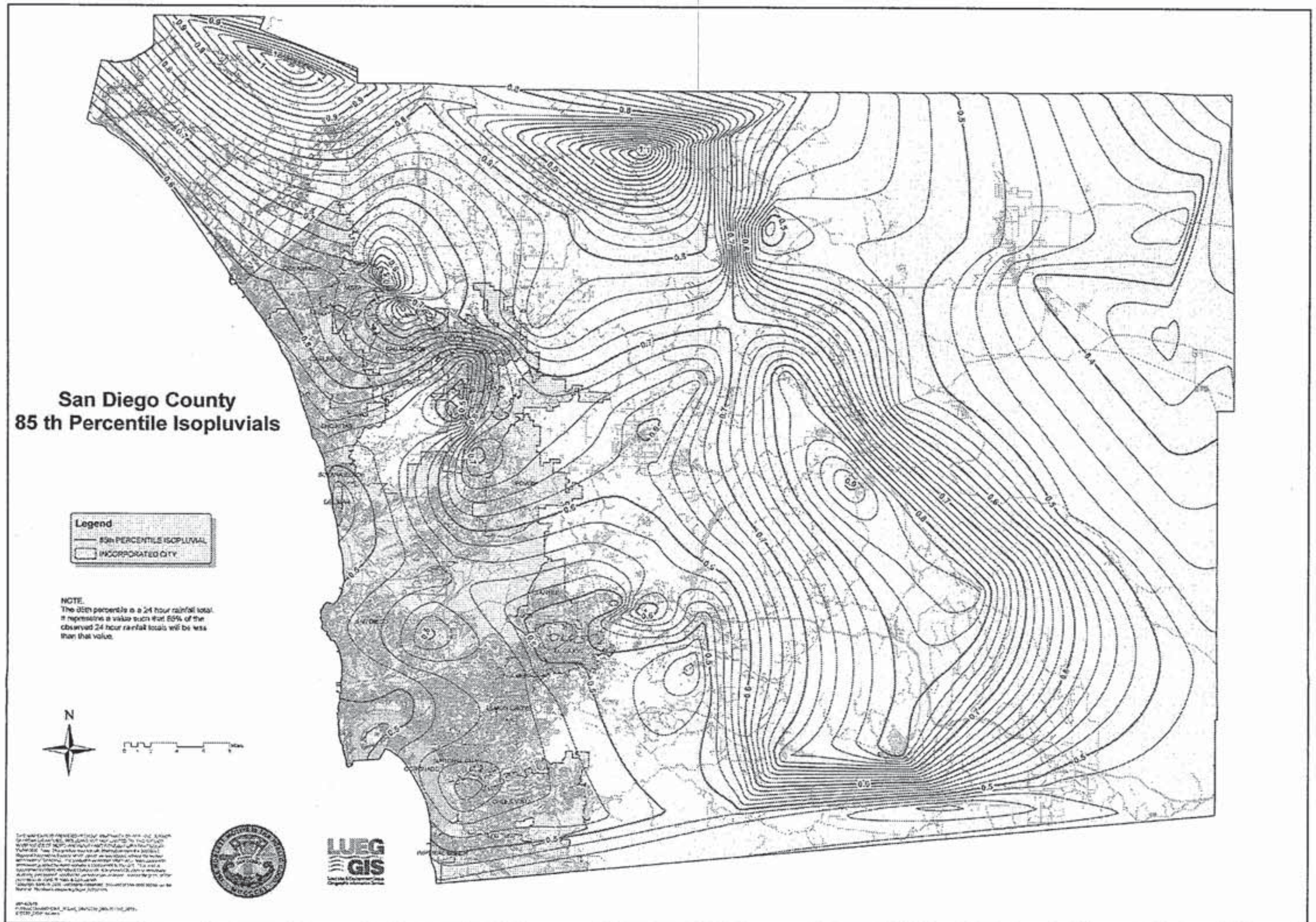


Figure B.1-1: 85th Percentile 24-hour Isopluvial Map

B.1.1 Runoff Factor

Estimate the area weighted runoff factor for the tributary area to the BMP using runoff factor (from Table B.1-1) and area of each surface type in the tributary area and the following equation.

Equation B.1-2: Estimating Runoff Factor for Area

$$C = \frac{\sum C_x A_x}{\sum A_x}$$

where:

C_x = Runoff factor for area X

A_x = Tributary area X (acres)

These runoff factors apply to areas receiving direct rainfall only. For conditions in which runoff is routed onto a surface from an adjacent surface, see Section B.2 for determining composite runoff factors for these areas.

Table B.1-1: Runoff factors for surfaces draining to BMPs – Pollutant Control BMPs

Surface	Runoff Factor
Roofs[1]	0.90
Concrete or Asphalt[1]	0.90
Unit Pavers (grouted)[1]	0.90
Decomposed Granite	0.30
Cobbles or Crushed Aggregate	0.30
Amended, Mulched Soils or Landscape	0.10
Compacted Soil (e.g., unpaved parking)	0.30
Natural (A Soil)	0.10
Natural (B Soil)	0.14
Natural (C Soil)	0.23
Natural (D Soil)	0.30

[1]Surface is considered impervious and could benefit from use of Site Design BMPs and adjustment of the runoff factor per Section B.2.1.

APPENDIX – XVII – Harvest and Use Feasibility Screening

Worksheet B.3-1. Harvest and Use Feasibility Screening

Harvest and Use Feasibility Screening	Worsksheet B.3-1

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 → THERE IS NO DEMAND FOR LANDSCAPE IRRIGATION IN THE 36 HOURS AFTER A RAIN EVENT.
☐ Other:______________

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. DEMAND =
[Provide a summary of calculations here] SEE ATTACHED CALCULATIONS

3. Calculate the DCV using worksheet B-2.1.
[Provide a results here]

3a. Is the 36-hour demand greater than or equal to the DCV?	3b. Is the 36-hour demand greater than 0.25DCV but less than the full DCV?	3c. Is the 36-hour demand less than 0.25DCV?
Yes / No ⇨ ⇩	Yes / No ⇨ ⇩	Yes ⇩
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.	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.	Harvest and use is considered to be infeasible.

JOB ONE PASEO
SHEET NO. 1 OF 2 REV.
CALCULATED BY DATE
CHECKED BY DATE
SCALE

HARVEST AND USE FEASIBILITY SCREENING CALCULATIONS:

BASED ON WORKSHEET B.3-1

DEMAND CALCULATION

TOTAL OFFICE SPACE = 280,000 SF = 6.43 AC

TOTAL COMMERCIAL SPACE = 95,071 SF = 2.18 AC

TOTAL RESIDENTAL SPACE = 800,000 SF = 18.37 AC

PER THE CITY OF SAN DIEGO SEWER DESIGN GUIDE (REVISED MAY 2015) TABLE 1-1 THE EQUIVALENT POPULATION (POP/NET AC) FOR THE ZONES LISTED ABOVE ARE:

OFFICE = 38.2

COMMERCIAL = 43.7

RESIDENTIAL (RM-4-10)* = 196.2

* ONE PASEO IS MIXED USE, AND THE RESIDENTAL PORTION IS 608 UNITS ON 6.07 AC, WHICH IS 100 UNITS / ACRE, WHICH IS MOST SIMILAR TO THE RM-4-10 ZONE WITH 109 UNITS/ACRE.

THUS, THE POPULATION BY ZONE ARE:

OFFICE ⇒ 38.2 POP/AC × 6.43 AC = 245.63 POP

COMMERCIAL ⇒ 43.7 POP/AC × 2.18 AC = 95.26 POP

RESIDENTIAL ⇒ 196.2 POP/AC × 18.37 AC = 3604 POP

PER TABLE 3.1-1, TOILET AND URINAL WATER USAGE PER RESIDENT OR EMPLOYEE FOR THE USES LISTED ABOVE ARE:

OFFICE = 7 GAL / EMPLOYEE

RETAIL = 7 GAL/EMPLOYEE

RESIDENTAL = 9.3 GAL / RESIDENT

JOB ONE PASEO

SHEET NO. 2 OF 2 REV.

CALCULATED BY DATE

CHECKED BY DATE

SCALE

THUS, THE DEMAND PER ZONE IS:

OFFICE = 245.63 EMP × 7 GAL/EMP = 1719 GAL = 230 CF

COMMERCIAL = 95.26 EMP × 7 GAL/EMP = 667 GAL = 89 CF

RESIDENTIAL = 3604 RES × 9.3 GAL/RES = 33,517 GAL = 4,481 CF

TOTAL = 4,800 CF

DEMAND IS BASED ON 36 HOURS, SO MULTIPLY BY 1.5

4,800 CF × 1.5 = 7,200 CF

$$\text{DEMAND} = \frac{7200 \text{ CF}}{33{,}094 \text{ CF}} = .22$$

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

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.

Definitions:
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.

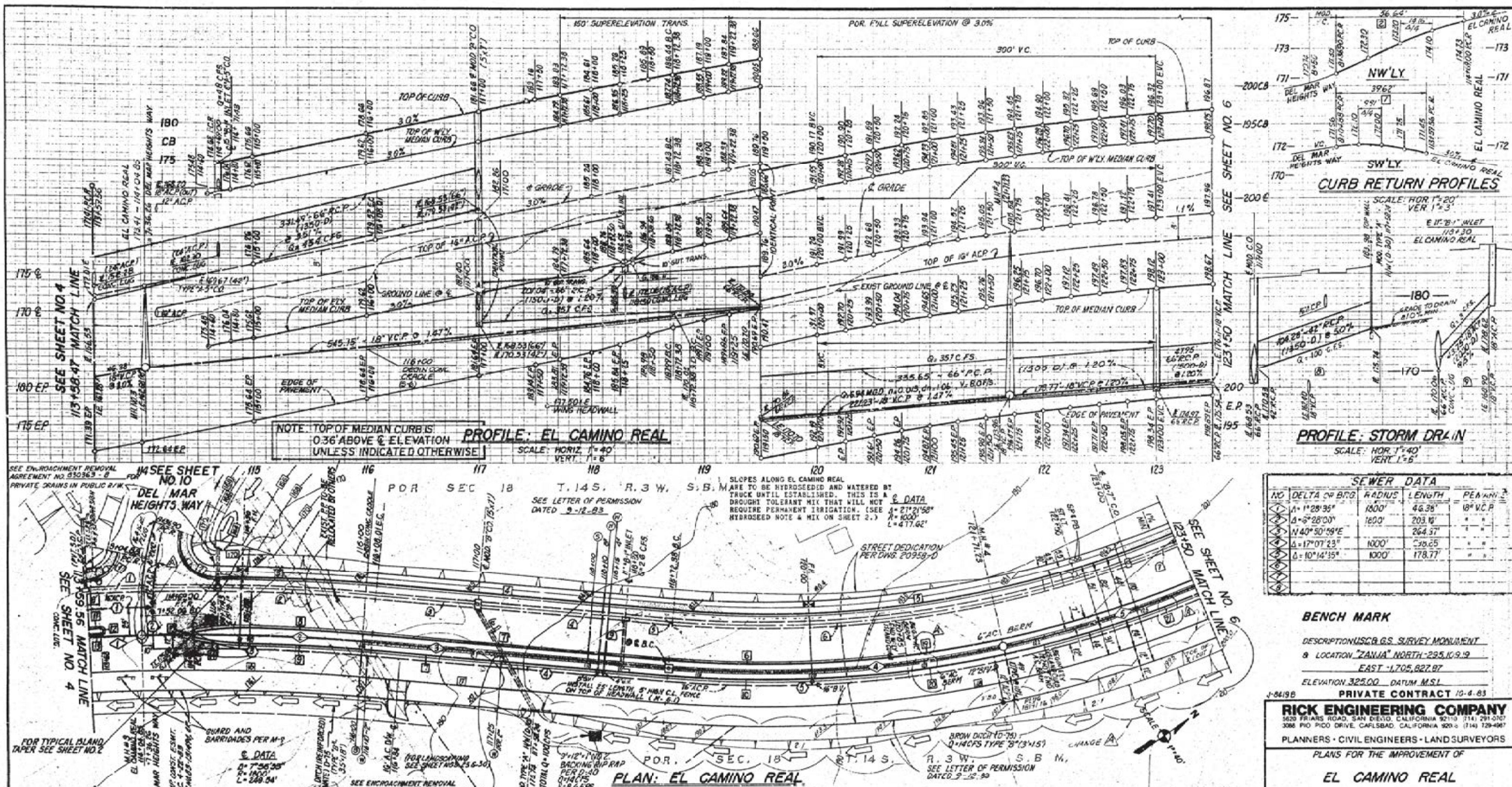
Tabulated figures are for general case. <u>The tabulated figures shall not be used if more accurate figures are available.</u>

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.

APPENDIX XVIII – Existing Improvement Plans



SEWER DATA				
NO	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	Δ=1°28'35"	1800'	46.38'	18" V.C.P.
2	Δ=6°28'00"	1800'	203.18'	" "
3	N40°50'59"E		264.37'	" "
4	Δ=17°07'23"	1000'	298.85'	" "
5	Δ=10°14'35"	1000'	178.77'	" "
6				
7				
8				

BENCH MARK

DESCRIPTION USC&GS SURVEY MONUMENT
& LOCATION "ZANJA" NORTH -295,109.19
EAST -1,705,827.87
ELEVATION 325.00 DATUM M.S.L.

J-8419B

PRIVATE CONTRACT 10-4-83

WATER DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	Δ=1°51'30"	1825'	59.19'	16" ACP
2	N55°37'01"W		31.00'	↓
3	Δ=6°06'23"	1788'	190.56'	↓
4	N40°50'59"E		263.69'	↓
5	Δ=27°21'58"	1012'	483.36	↓
6				
7				
8				

CURB DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	Δ=76°32'40"	30'	40.13'	6" TYPE "H" CURB
2	Δ=106°38'16"	30'	55.84'	↓
3	Δ=4°28'48"	1851'	144.73'	↓
4	N40°50'59"E		264.37'	↓
5	Δ=27°21'58"	949'	453.26'	↓
6	Δ=12°10'56"	993'	211.13	6" TYPE "B-2" CURB
7	N40°50'59"E		264.37'	↓
18	Δ=3°27'05"	1807'	108.43'	↓
19	Δ=15°11'00"	993'	263.15'	6" AC BERM

CURB DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
9	Δ=3°26'17"	1773'	107.89'	6" TYPE "B-2" CURB
10	Δ=12°10'56"	1007'	214.11'	
11	Δ=0°18'12"	1807'	9.57'	
12	Δ=180°00'00"	2'	6.28'	
13	Δ=0°18'12"	1793'	9.49'	
14	TRANS. CURB		50.00'	
15	Δ=160°00'00"	2'	5.59'	↓
16	Δ=7°56'35"	1769'	245.24'	6" AC BERM
17	N40°50'59"E		264.37'	
18	Δ=27°21'58"	1031'	498.43'	↓
20	Δ=6°59'24"	1007'	122.85'	↓
21	Δ=8°11'36"	1007'	144.00'	6" TYPE "B-2" CURB

CHANGE

STORM DRAIN DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	Δ=3°33'39"	1841.00'	114.41'	66" RCP (1350-D)
2	Δ=4°20'51"	1891.00'	137.69'	"
3	N40°50'59"E	-	87.39'	"
4	N40°50'59"E	-	84.22'	66" RCP (1500-D)
5	N40°50'59"E	-	42.38'	"
6	Δ=24°30'03"	959.00'	410.09'	"
7	Δ=2°51'53"	959.00'	47.95'	"
8	N83°06'08"W	-	104.28'	42" RCP (1350-D)
9	N49°09'01"W	-	43.75'	18" ACP (2000-D)
10				

ENGINEER OF WORK

HOUSHMAND AFTAHI, R.C.E. 18876

RICK ENGINEERING COMPANY
5620 FRIARS ROAD, SAN DIEGO, CALIFORNIA 92110 (714) 291-0707
3088 PIO PICO DRIVE, CARLSBAD, CALIFORNIA 92008 (714) 729-4987
PLANNERS · CIVIL ENGINEERS · LAND SURVEYORS

PLANS FOR THE IMPROVEMENT OF

EL CAMINO REAL

IN EMPLOYMENT CENTER DEVELOPMENT UNIT NO. 28

CITY OF SAN DIEGO, CALIFORNIA

SHEET 5 OF 32 SHEETS

W.O. TM 83 0800 NO. 830363

3-26-84

DESCRIPTION		BY	APPROVED	DATE	FILMED
ORIGINAL					
CHANGE	△	RICK ENG.		8-4-84	

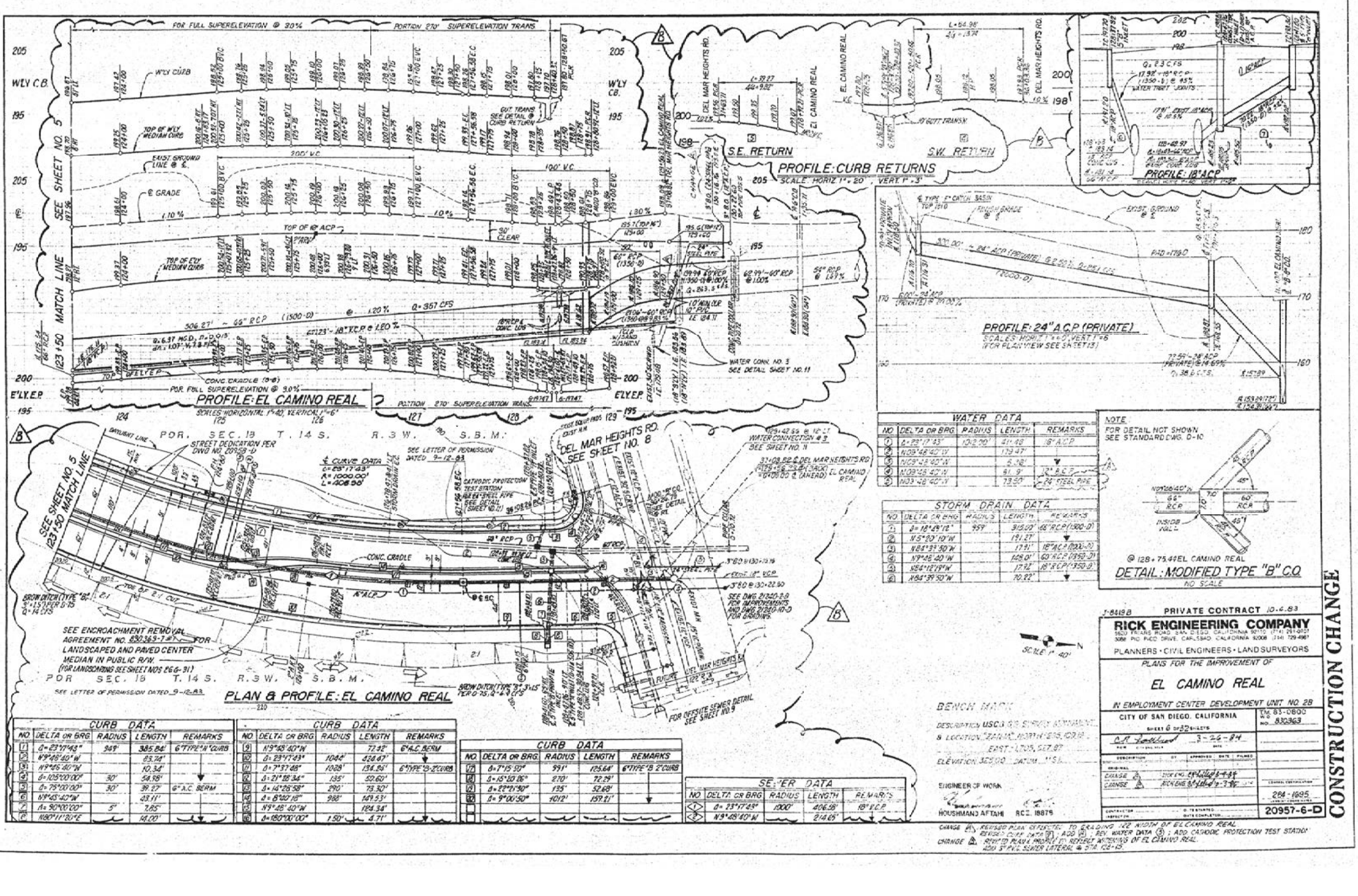
CONTRACTOR ____ DATE STARTED ____
INSPECTOR ____ DATE COMPLETED ____

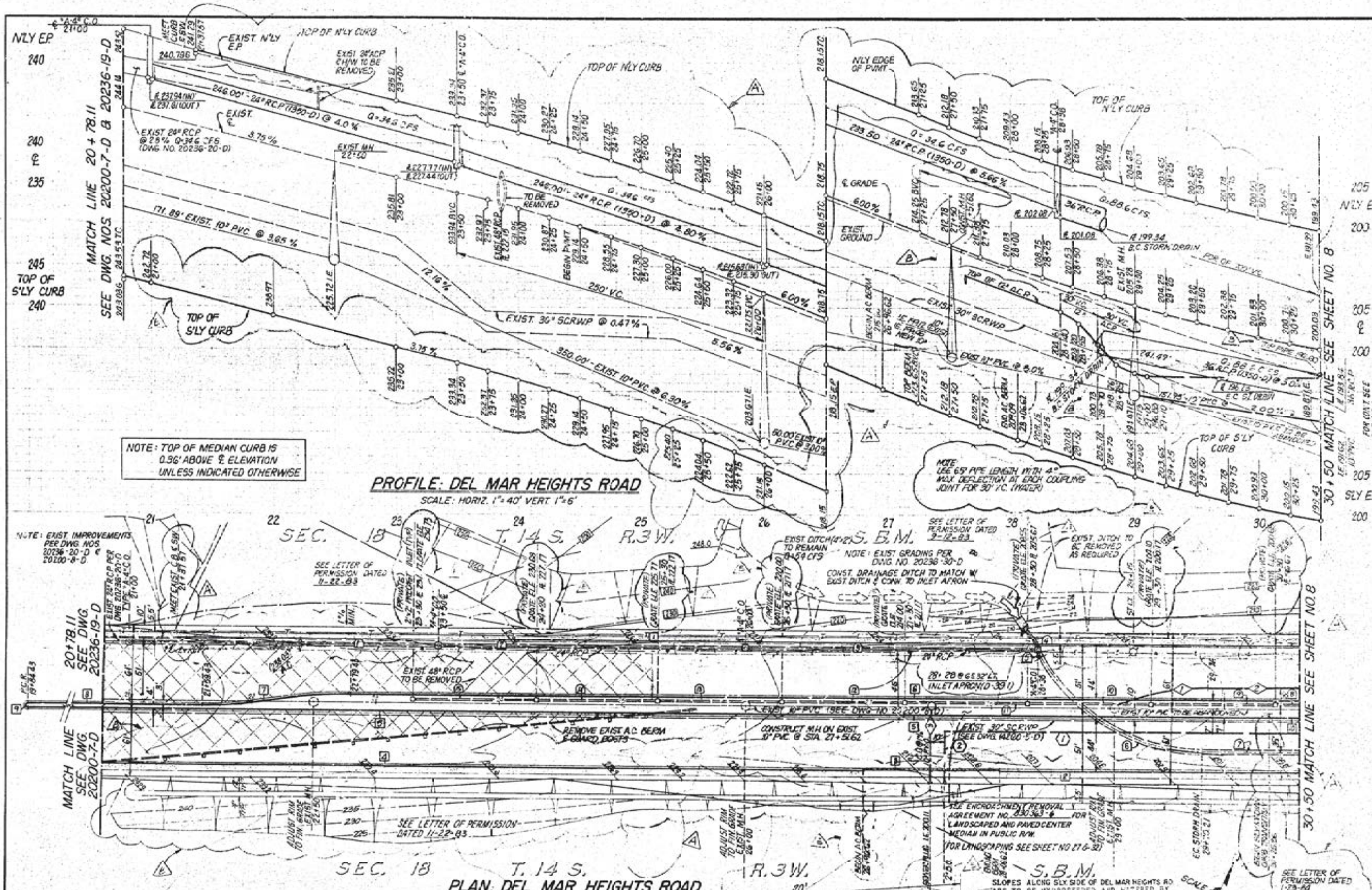
284-1695

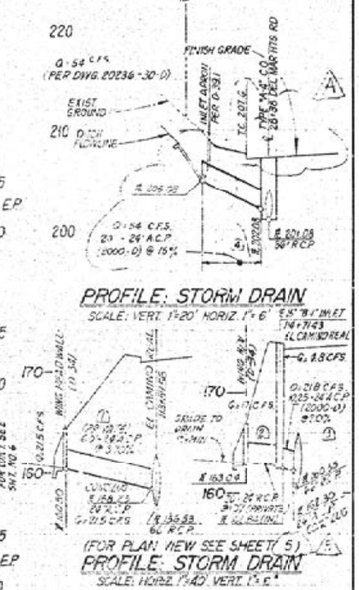
20957-5-D

CHANGE △ : GRADE 122' OF EL CAMINO REAL FROM STA. 118+72.38 TO 123+50; ADD 10" P.V.C. AT DEL MAR HEIGHTS WAY; REV. CURB DATA 6 & 16; ADD 19, 20 & 21.

CONSTRUCTION CHANGE


PROFILE: EL CAMINO REAL
SCALES HORIZONTAL 1"=40, VERTICAL 1"=6'
SEE SHEET NO. 5
123+50 MATCH LINE
FOR FULL SUPERELEVATION @ 3.0%
PORTION 270' SUPERELEVATION TRANS.
PROFILE: CURB RETURNS
SCALE: HORIZ 1"=20', VERT 1"=3'
S.E. RETURN
S.W. RETURN
PROFILE: 18" ACP
PROFILE: 24" A.C.P. (PRIVATE)
(FOR PLAN VIEW SEE SHEET 13)
DEL MAR HEIGHTS RD.
SEE SHEET NO. 8
PLAN & PROFILE: EL CAMINO REAL
POR. SEC. 18 T. 14 S. R. 3 W. S.B.M.
SEE ENCROACHMENT REMOVAL AGREEMENT NO. 830369-7 FOR LANDSCAPED AND PAVED CENTER MEDIAN IN PUBLIC R/W.
WATER DATA
STORM DRAIN DATA
CURB DATA
SEWER DATA
NOTE
FOR DETAIL NOT SHOWN SEE STANDARD DWG. D-10
@ 128+75.44 EL CAMINO REAL
DETAIL: MODIFIED TYPE "B" C.O.
NO SCALE
PRIVATE CONTRACT 10-6-83
RICK ENGINEERING COMPANY
PLANNERS · CIVIL ENGINEERS · LAND SURVEYORS
PLANS FOR THE IMPROVEMENT OF
EL CAMINO REAL
IN EMPLOYMENT CENTER DEVELOPMENT UNIT NO. 2B
CITY OF SAN DIEGO, CALIFORNIA
BENCH MARK
ENGINEER OF WORK
HOUSHMAND AFTAHI RCE 18875
20957-6-D
CONSTRUCTION CHANGE





CURB DATA				
NO	DELTA OR BRG	RADIUS	LENGTH	REMARKS
1	N65°11'20"E	-	912.43'	6" TYPE "A" CURB
2	N65°11'20"E	-	343.38'	" "
3	N65°11'20"E		110.00'	6" AC BERM
4	N65°11'20"E	-	618.51'	6" TYPE "H" CURB
5	N65°11'20"E	-	1040.98'	6" TYPE "B-2" CURB
6	N65°11'20"E	-	770.57'	
7	SEE LEFT TURN POCKET DETAIL		120.07'	
8	N65°11'20"E	-	175.00	
9	Δ=180°00'00"	2.00'	6.28'	
10	N 66°14'35" E	-	24.65'	

SEWER DATA				
NO.	DELTA OR BRG.	RADIUS	LENGTH	REMARKS
1	Δ=22°19'54"	250.00'	77.95'	10" P.V.C.
2	N65°11'20"E		74.00'	10" P.V.C.
3	N 24°48'40"W	-	66.00'	10" PVC

WATER DATA				
NO.	DELTA OR BRG	RADIUS	LENGTH	REMARKS
1	N65°11'20"E	-	288.38'	12" ACP
2	N 24°48'40"W	-	46.00'	" "

STORM DRAIN DATA				
NO	DELTA OR BRG	RADIUS	LENGTH	REMARKS
1	N65°11'20"E		246.00'	24" RCP (1350-D)
2	N65°11'20"E		243.00'	
3	N65°11'20"E		233.50'	
4	N54°48'40"W		20.00'	24" ACP (2000-D)
5	N54°48'40"W		4.62'	36" RCP (1350-D)
6	Δ=60°00'00"	150.00'	157.08'	
7	N 65°11'20"E		79.77'	
8	N 65°11'20"E		20.00'	12" ACP (PRIVATE)
9	N 65°11'20"E		100.00'	
10	N65°11'20"E		100.00'	
11	N65°11'20"E		100.00'	
12	N65°11'20"E		100.00'	
13	N65°11'20"E		100.00'	
14	N 65°11'20"E		100.00'	
15	N65°11'20"E		100.00'	

J-6419B PRIVATE CONTRACT 10-4-83

RICK ENGINEERING COMPANY

PLANNERS · CIVIL ENGINEERS · LAND SURVEYORS

PLANS FOR THE IMPROVEMENT OF

DEL MAR HEIGHTS ROAD

IN EMPLOYMENT CENTER DEVELOPMENT UNIT NO. 2B

CITY OF SAN DIEGO, CALIFORNIA

SHEET 7 OF 32 SHEETS

W.O. NO. T.M. 83-0800 830363

3-26-84

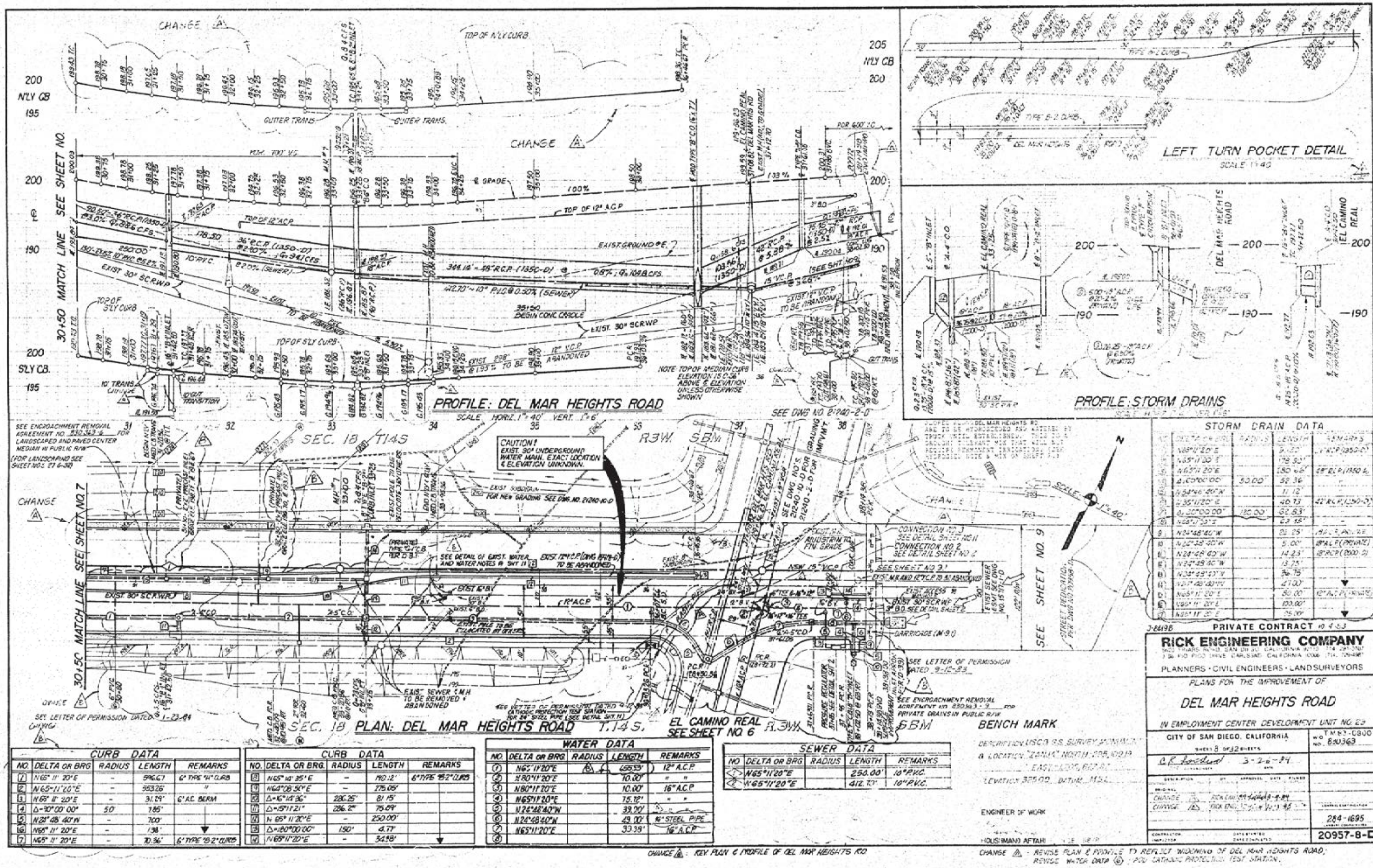
ORIGINAL
CHANGE A
CHANGE B

281-1695

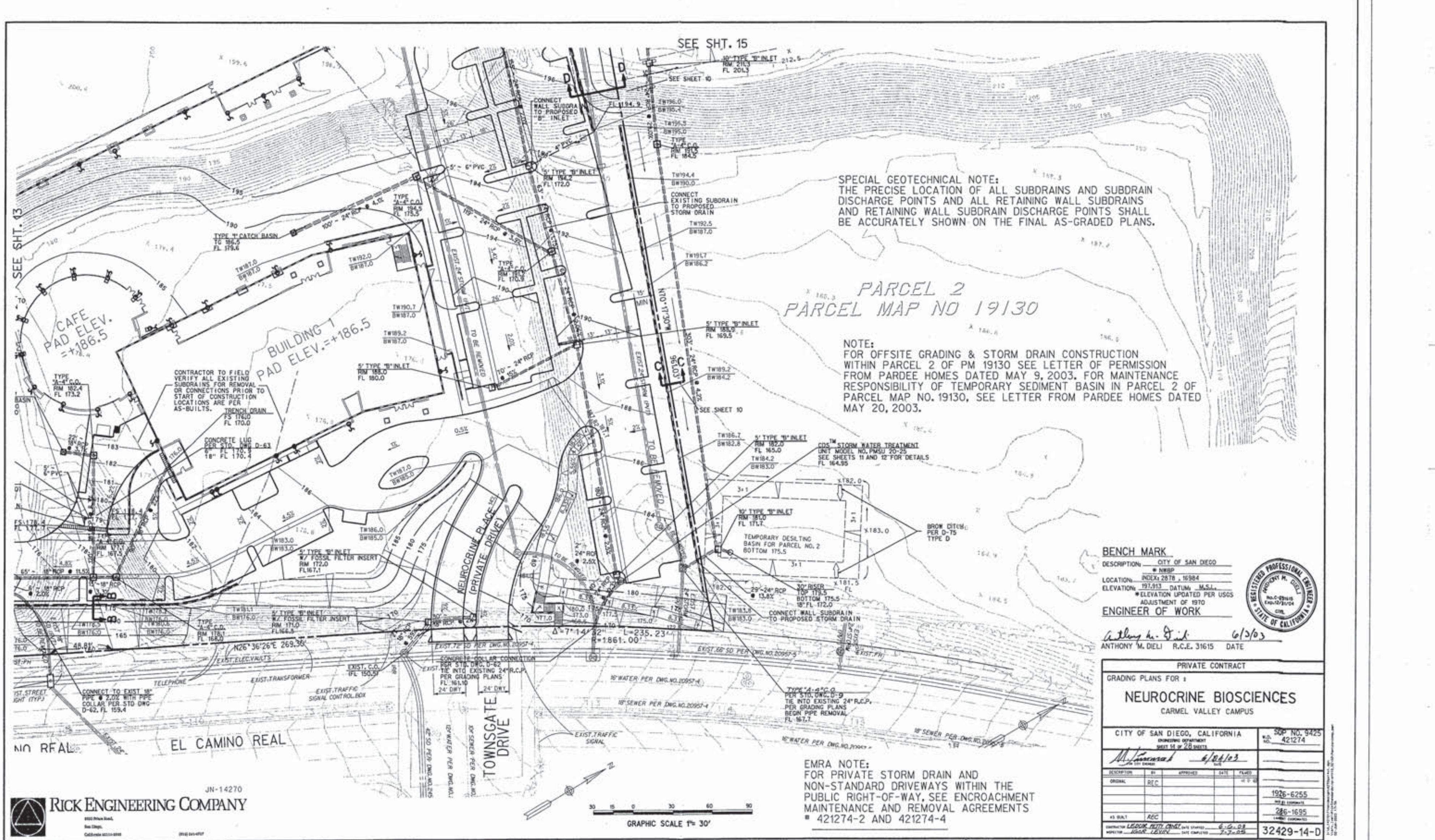
20957-7-D

CONSTRUCTION CHANGE

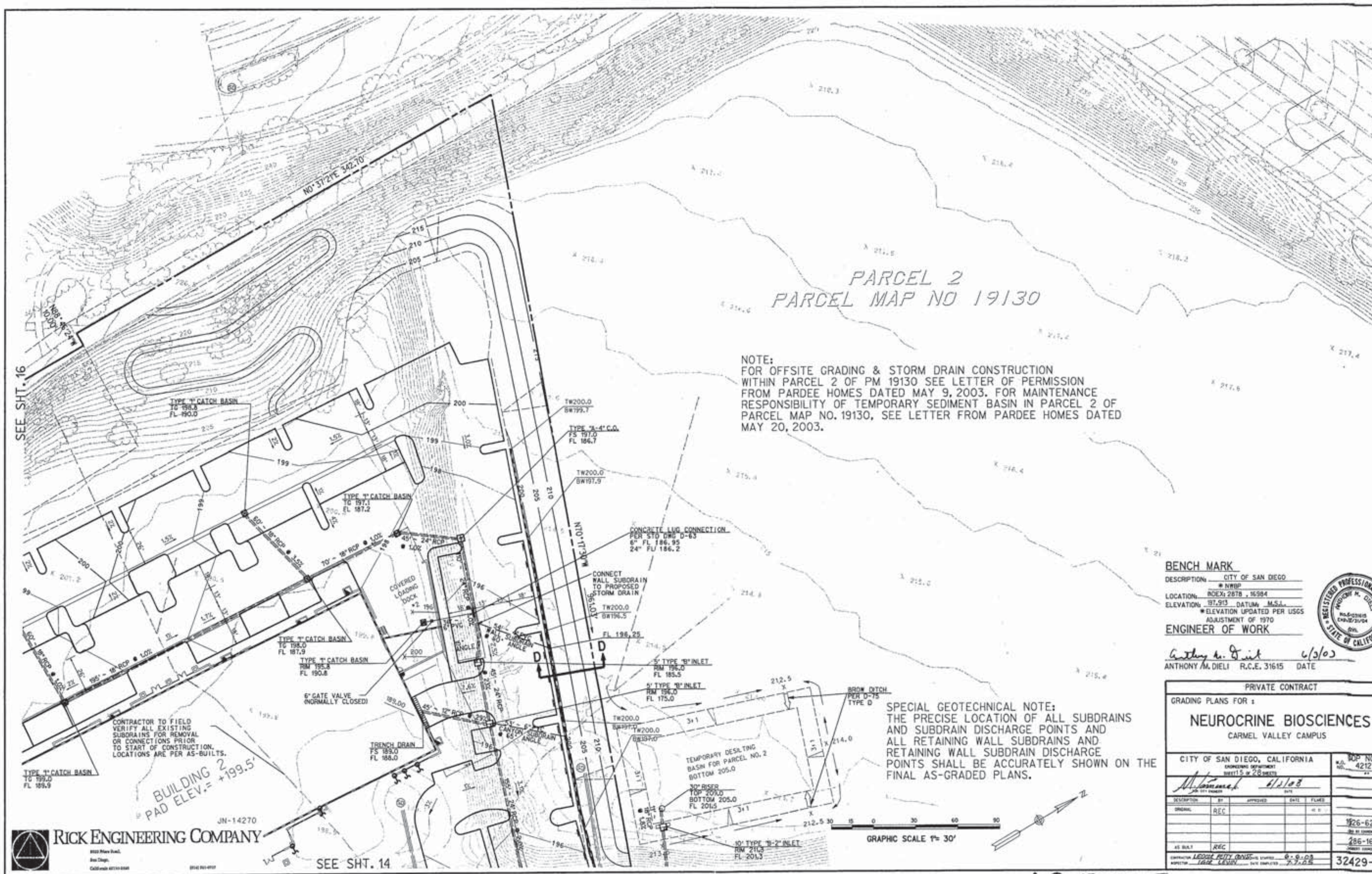
CHANGE A: REVISE PLAN & PROFILE TO REFLECT WIDENING OF DEL MAR HEIGHTS ROAD.
CHANGE B: REVISE PLAN & PROFILE OF DEL MAR HEIGHTS ROAD.



CONSTRUCTION CHANGE


SEE SHT. 15
SEE SHT. 13
SPECIAL GEOTECHNICAL NOTE:
THE PRECISE LOCATION OF ALL SUBDRAINS AND SUBDRAIN DISCHARGE POINTS AND ALL RETAINING WALL SUBDRAINS AND RETAINING WALL SUBDRAIN DISCHARGE POINTS SHALL BE ACCURATELY SHOWN ON THE FINAL AS-GRADED PLANS.
PARCEL 2
PARCEL MAP NO 19130
NOTE:
FOR OFFSITE GRADING & STORM DRAIN CONSTRUCTION WITHIN PARCEL 2 OF PM 19130 SEE LETTER OF PERMISSION FROM PARDEE HOMES DATED MAY 9, 2003. FOR MAINTENANCE RESPONSIBILITY OF TEMPORARY SEDIMENT BASIN IN PARCEL 2 OF PARCEL MAP NO. 19130, SEE LETTER FROM PARDEE HOMES DATED MAY 20, 2003.
CAFE PAD ELEV. =+186.5
BUILDING 1 PAD ELEV.=+186.5
CONTRACTOR TO FIELD VERIFY ALL EXISTING SUBDRAINS FOR REMOVAL OR CONNECTIONS PRIOR TO START OF CONSTRUCTION LOCATIONS ARE PER AS-BUILTS.
TEMPORARY DESILTING BASIN FOR PARCEL NO. 2 BOTTOM 175.5
NEUROCRINE PLACE (PRIVATE DRIVE)
TOWNSGATE DRIVE
EL CAMINO REAL
BENCH MARK
DESCRIPTION: CITY OF SAN DIEGO
LOCATION: INDEX: 2878, 16984
ELEVATION: 197.913 DATUM: M.S.L.
*ELEVATION UPDATED PER USGS ADJUSTMENT OF 1970
ENGINEER OF WORK
ANTHONY M. DIELI R.C.E. 31615 DATE 6/3/03
EMRA NOTE:
FOR PRIVATE STORM DRAIN AND NON-STANDARD DRIVEWAYS WITHIN THE PUBLIC RIGHT-OF-WAY, SEE ENCROACHMENT MAINTENANCE AND REMOVAL AGREEMENTS # 421274-2 AND 421274-4
GRAPHIC SCALE 1"= 30'
JN-14270
RICK ENGINEERING COMPANY
PRIVATE CONTRACT
GRADING PLANS FOR :
NEUROCRINE BIOSCIENCES
CARMEL VALLEY CAMPUS
CITY OF SAN DIEGO, CALIFORNIA
SDP NO. 9425
421274
1926-6255
286-1695
32429-14-D

AS-BUILT


PARCEL 2
PARCEL MAP NO 19130
NOTE:
FOR OFFSITE GRADING & STORM DRAIN CONSTRUCTION WITHIN PARCEL 2 OF PM 19130 SEE LETTER OF PERMISSION FROM PARDEE HOMES DATED MAY 9, 2003. FOR MAINTENANCE RESPONSIBILITY OF TEMPORARY SEDIMENT BASIN IN PARCEL 2 OF PARCEL MAP NO. 19130, SEE LETTER FROM PARDEE HOMES DATED MAY 20, 2003.
SPECIAL GEOTECHNICAL NOTE:
THE PRECISE LOCATION OF ALL SUBDRAINS AND SUBDRAIN DISCHARGE POINTS AND ALL RETAINING WALL SUBDRAINS AND RETAINING WALL SUBDRAIN DISCHARGE POINTS SHALL BE ACCURATELY SHOWN ON THE FINAL AS-GRADED PLANS.
CONTRACTOR TO FIELD VERIFY ALL EXISTING SUBDRAINS FOR REMOVAL OR CONNECTIONS PRIOR TO START OF CONSTRUCTION. LOCATIONS ARE PER AS-BUILTS.
BUILDING 2
PAD ELEV.= +199.5'
COVERED LOADING DOCK
TEMPORARY DESILTING BASIN FOR PARCEL NO. 2
BOTTOM 205.0
30" RISER
TOP 209.0
BOTTOM 205.0
FL 201.5
10' TYPE "B-2" INLET
RIM 213.0
FL 201.3
BROW DITCH PER D-75 TYPE D
CONCRETE LUG CONNECTION PER STD DWG D-63
6" FL 186.95
24" FL 186.2
CONNECT WALL SUBDRAIN TO PROPOSED STORM DRAIN
TYPE "A-4" C.O.
FS 197.0
FL 186.7
TYPE "I" CATCH BASIN
TG 198.8
FL 190.0
TYPE "I" CATCH BASIN
TG 197.1
FL 187.2
TYPE "I" CATCH BASIN
TG 198.0
FL 187.9
TYPE "I" CATCH BASIN
RIM 195.8
FL 190.8
TYPE "I" CATCH BASIN
TG 199.0
FL 189.9
6" GATE VALVE (NORMALLY CLOSED)
TRENCH DRAIN
FS 193.0
FL 188.0
5' TYPE "B" INLET
RIM 196.0
FL 185.5
5' TYPE "B" INLET
RIM 196.0
FL 175.0
FL 198.25
NO°37'21"E 342.70'
N70°17'30"W
GRAPHIC SCALE 1"= 30'
SEE SHT. 16
SEE SHT. 14
JN-14270
RICK ENGINEERING COMPANY
BENCH MARK
DESCRIPTION: CITY OF SAN DIEGO
LOCATION: ROEX: 2878, 16984
ELEVATION: 197.913 DATUM: M.S.L.
*ELEVATION UPDATED PER USGS ADJUSTMENT OF 1970
ENGINEER OF WORK
ANTHONY M. DIELI R.C.E. 31615 DATE 6/3/03
PRIVATE CONTRACT
GRADING PLANS FOR:
NEUROCRINE BIOSCIENCES
CARMEL VALLEY CAMPUS
CITY OF SAN DIEGO, CALIFORNIA
SHEET 15 OF 28 SHEETS
W.O. NO. 421274
1926-6255
286-1695
32429-15-D
AS-BUILT

APPENDIX XIX –Stormtrap System Information

View Projects >>

StormTrap Images

360° Rotational View

StormTrap offers the stormwater management solutions you need to control the volume and discharge timing of water runoff. Our engineers can customize the DoubleTrap solution to meet your exact needs, and our modular design allows us to maximize your storage volume while minimizing your footprint and overall costs.

Excess stormwater runoff can cause a myriad of problems, from flooding and erosion to stormwater quality degradation. StormTrap can integrate stormwater treatment functions to ensure that the discharged water will not be filled with contaminants and pollutants. The DoubleTrap system includes:

Features

- Durable, reinforced, high-strength concrete with internal height dimensions that range from 2′-2″ to 11′-4″.
- An innovative design that facilitates quick and efficient installations and the smallest overall footprint.
- The lowest overall installed costs.
- A flexible design that can allow stormwater infiltration or remain a completely contained system.
- Lifetime Warranty

At StormTrap, we are committed to helping you get the stormwater detention or retention systems you need to manage the flow of runoff. Find out how our modular designs can provide the fast and reliable system you need today. Request a free preliminary design and budget estimate today.

Atkins North America, Inc.
9275 Sky Park Court, Suite 200
San Diego, California 92123

Telephone: +1.858.874.1810
Fax: +1.858.514.1001

www.atkinsglobal.com/northamerica

December 21, 2015

Mr. Leonard Wilson
Development Services Department
City of San Diego
1222 First Avenue
San Diego, CA 92101

SUBJECT: NEW ONE PASEO WATER STUDY

Dear Mr. Wilson:

This letter report constitutes a revised Water Study (Study) for the New One Paseo Project (Project) formally known as the San Diego Corporate Center project (Approved Project), which is a proposed mixed use town center development in Carmel Valley by Kilroy Realty Corporation. The previous study was submitted and approved by the City of San Diego (City) in June 2011. This revised study is for your review and approval.

The purpose of the revised study is to update the water system requirements based on the new proposed Project site lay-out and land use. In addition, the City has requested an evaluation of constructing a private water system onsite in lieu of a public system. The approved water study assumed a public water system onsite. Therefore, this analysis identifies the changes in the on-site facilities required to provide domestic water and fire service to the Project. The study determines potable water demands and recommends facility sizes for the proposed on-site domestic water and fire service systems required to serve the Project. The study is based on City's planning and design criteria for the public water system.

BACKGROUND

The Project is a 23-acre mixed use town center project within the Carmel Valley Community Planning Area in the City of San Diego. In June 2011, the project consisted of 608 multi-family residential units, 806,000 square feet of retail and office space, and a 150-room hotel. The project has been redesigned to reduce the commercial development. Total square footage was reduced from 1,857,440 gsf to 1,175,871 gsf. The major changes since June 2011 include elimination of the hotel, reduction in square footage of residential, and retail and office uses. The total number of residential units remain at 608 units. Table 1 below illustrates the land uses included in the New One Paseo Project. **Figure 1** shows the proposed Project site.

Table 1. New One Paseo Land Uses

Land Use	Gross Square Footage	Number of Units
Office (Multi-tenant)	280,000	--
Retail	95,871	--
Residential	800,000	608
Total	**1,175,871**	**608**

WATER SERVICE

The Project site is located in the City's 470 Pressure Zone (PZ), which primarily serves the Carmel Valley area through pressure reducing facilities from the City's 610 North City Pressure Zone. The 470 PZ provides water service to the Project site from multiple sources. The primary Source is the 610/470 pressure reducing station (PRS) at Del Mar Heights Road and El Camino Real which supplies the 470 PZ pipelines in both Del Mar Heights Road and El Camino Real. A second 610/470 PRS is located at Lower Ridge Road, just west of High Bluff Drive and supplies the 16-inch 470 PZ in High Bluff Drive. The proximity of the PRS's to the City's 30-inch Del Mar Heights Transmission Main (610 PZ) will provide a reliable source to supply pressure at a 470 HGL. In addition, a 610/470 PRS at Carmel Country Road and Townsgate Drive provides a redundant source of 470 PZ water supply via Townsgate Drive to El Camino Real.

The Project site can be served via connections to the existing 16-inch water main in El Camino Real and the existing 12-inch main in Del Mar Heights Road. Together, these connections will provide the City the required reliable water supply to the proposed project for fire protection and under a private system concept domestic water service to the buildings.

The previously approved analysis modeled piping within the Project as public (City maintained) pipelines. In 2012, the City adopted a policy that requires private waterlines be installed on private property. In discussions with the City, the Project was revised to eliminate the public waterlines within the development. The hydraulic analysis will model the onsite fire system as a private system with backflow devices at the public connections on Del Mar Heights Road and El Camino Real. The domestic water system for the buildings will be metered at the connections to the public water pipelines.

Based on a graded pad elevation range of 180 to 220 feet, the static hydraulic pressures within the proposed on-site system will range from 108 to 125 psi. An on-site fire hydrant layout and fire system was provided by Leppert Engineering and is shown on **Exhibit 1**. Final fire hydrant placement and locations will be set in accordance with City criteria. Existing fire hydrants along the project site will be utilized and relocated as necessary.

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WATER DEMANDS

Projected water demands for the June 2011 project and the New One Paseo Project are shown in **Table 2**. The total average day demand (ADD) for the Approved Project was 283,450 gpd (197 gpm). The total average day demand (ADD) for the New One Paseo Project is 214,690 gpd (149 gpm). Based on City Design Criteria, the peaking factors are 2.1 for max day and 5.2 for peak hour. Based on the City's Design Criteria, the maximum day demand is 450,849 gpd (313 gpm) and a peak hour demand of 775 gpm. Based on the demands shown below, the demands for the New One Paseo Project are reduced from the Approved Project by 24%.

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Table 2. Projected Site Water Demands Comparison

Approved Project (June 2011)

Component	Area/Units	Population Density	Equivalent Population	Unit Rate	Average Demand (gpd)
Retail/Commercial	6.20 ac			5,000 gpd/n-acre	30,990
Hotel	2.30 ac			6,555 gpd/n-acre	15,050
Office	12.30 ac			5,730 gpd/n-acre	70,510
Residential	608 DU	1.83 / DU	1,113	150 gpd/person	166,900
Total					**283,450 gpd**

New One Paseo Project

Component	Area/Units	Population Density	Equivalent Population	Unit Rate	Average Demand (gpd)
Retail/Commercial	95,871 sq. ft. (2.20 ac)			5,000 gpd/n-acre	11,000
Office	280,000 sq. ft. (6.42 ac)			5,730 gpd/n-acre	36,790
Residential	608 DU	1.83 / DU	1,113	150 gpd/person	166,900
Total					**214,690 gpd**

Notes:
1. Non-residential areas are based on component floor space and are considered a net area.
2. Residential unit demands based on SANDAG multi-family residential density for Carmel Valley (1.83 pph).
3. Retail/Commercial demands based on City of San Diego Design Guidelines.

WATER SYSTEM DESIGN CRITERIA

The City's planning and design criteria for potable water system sizing and service conditions were used to analyze and layout the proposed facilities. A summary of criteria used is provided in **Table 3**.

Table 3. City Planning and Design Criteria

Parameter	Criteria
Hazen-Williams Coefficient, C	120
Maximum Velocity, Max Day Demand	10 fps
Maximum Velocity, Max Day plus Fire	15 fps
Maximum Static Pressure	125 psi
Minimum Static Pressure	65 psi
Minimum Pressure, Peak Hour Demand	40 psi
Minimum Pressure, Max Day plus Fire	20 psi
Multi-Family Residential Fire Flow	3,000 gpm
Commercial Fire Flow	4,000 gpm

City criteria used in this analysis include the fire flow requirement of 4,000 gpm for commercial/mixed use developments. The City allows the distribution of 4,000 gpm over multiple hydrants within 300 feet of each other along a street. Maximum day plus fire flow demand scenarios were run at selected key locations within the Project area.

HYDRAULIC ANALYSIS

Exhibit 1 shows the existing and proposed on-site City water distribution system for the Project. The hydraulic analysis utilized a hydraulic model in Innovyze InfoWater version 11.0 representing the Project site as a pipe and node network. Simulated model boundary conditions include a fixed-head reservoir at El Camino Real and Del Mar Heights Road using an assumed HGL of 450 feet and water demands simulating distribution system. The 450 feet HGL assumes some pressure loss (<10 psi) at the PRS. Additional boundary conditions were included to simulate 470 Zone distribution demands within the Carmel Valley area and were included on High Bluff Drive and at the 16-inch pipeline on El Camino Real. The hydraulic analysis focused primarily on fire flow availability as the most critical demand scenario. A Hazen-Williams C-value of 120 for all pipes to calculate headloss.

Analyses consisted of subjecting the proposed private water system to specified demand conditions, and comparing to the City's design criteria. The hydraulic model simulated projected maximum day plus fire flow demand conditions, at critical nodes throughout the proposed Project site. **Table 4** presents those selected model results that resulted in minimum pressures and maximum velocities and which therefore reflect the critical hydraulic conditions for site evaluation.

Table 4. Hydraulic Model Simulations

Run No.	Description	Maximum Velocity (fps)	Minimum Pressure (psi)
1	Maximum Day Demands with 4,000 gpm fire (Nodes J120 and J122)	13.3	84.5
2	Maximum Day Demands with 4,000 gpm fire (Nodes J110 and J176)	12.8	85.3
3	Peak Hour	7.0	83.7

In all cases, minimum pressures and maximum pipeline velocities remained within City design criteria requirements. Based on the assumed boundary HGL of 450 feet, onsite minimum peak hour pressures were well above the City minimum criteria of 40 psi and minimum fire flow residuals were above 20 psi. Infowater simulation results and a pipe and node map are provided in **Appendix A**.

ATKINS

RECOMMENDED SYSTEM

The recommended potable water system for providing service to the Project is illustrated in **Exhibit 1**. Key highlights include:

- A new 12-inch 470 Zone waterline within Del Mar Heights Road extended from the 610/470 PRS supply source at El Camino Real and Del Mar Heights Road to High Bluff Drive. A portion of this segment is a relocation.

- This looped 470 Zone waterline will allow domestic water services (and meters) to be connected along Del Mar Height Road and El Camino Real to serve the project. This will facilitate implementation of a private water system onsite.

- A 8-inch private fire water system with four connections to the 470 Zone will supply the required 4,000 gpm fire flow and meet minimum pressure criteria.

In summary, the proposed public waterline and private system will provide water service to the Project site in conformance with applicable City of San Diego requirements.

We look forward to working with you and your staff toward the successful completion of this project. Please contact me at (858) 514-1042 with any questions or comments you may have.

Sincerely yours,

Atkins

Mark B. Elliott, P.E.
Project Manager
MBE:

c: Robert Little and Kim Elliott, Kilroy Realty Corporation
Tony Dieli and John Leppert, Leppert Engineering

Enclosures: Figure 1 – Project Site
Figure 2 – Hydraulic Control Map
Exhibit 1 – Proposed Utilities
Appendix A – Hydraulic Model Data
Exhibit A-1 – Pipe and Node Map

FIGURE 1
SITE LOCATION

9/24/10 SDO LA Z:\IS\Projects\Kilroy\KilroySite.mxd

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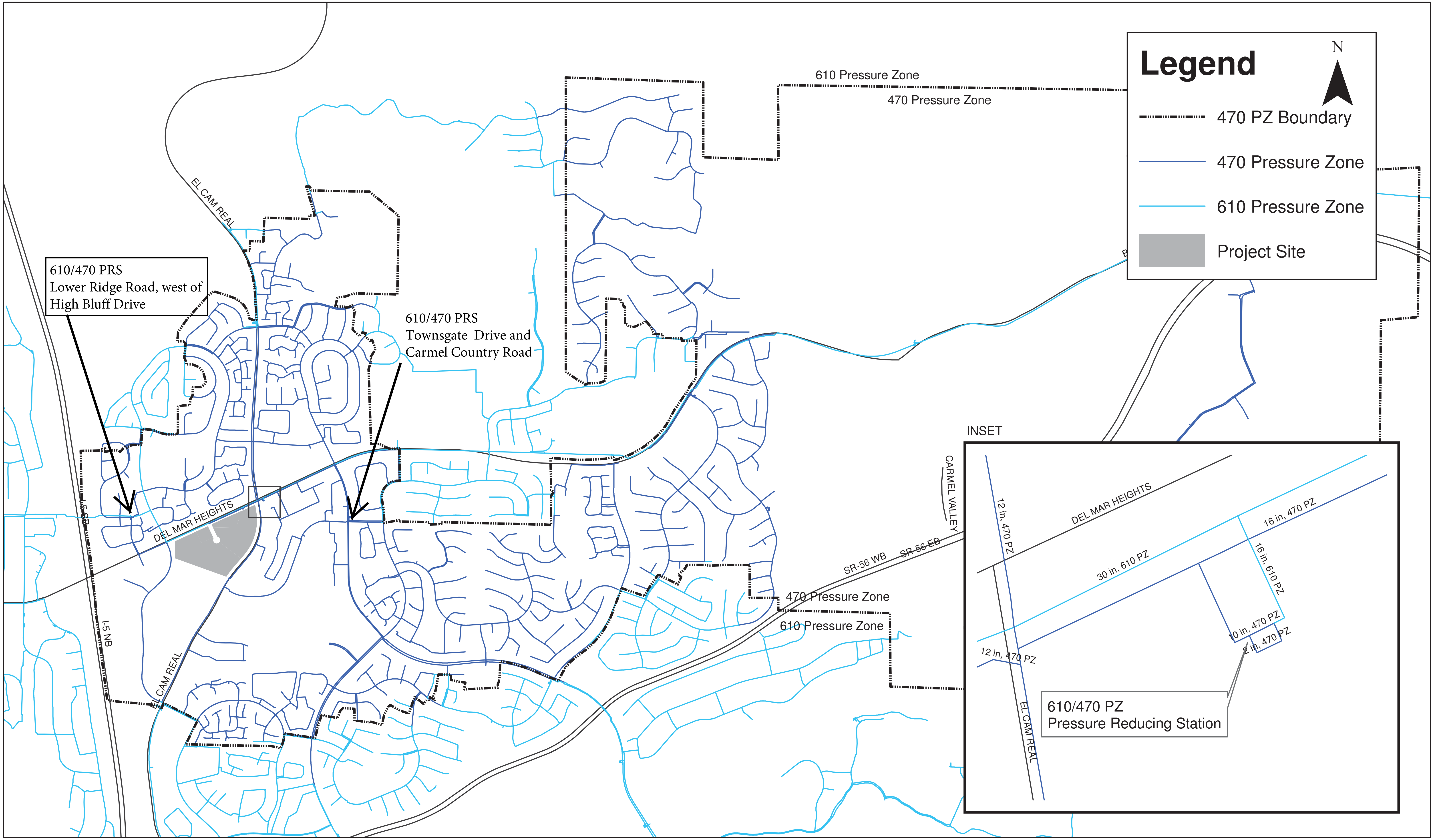
San Diego Corporate Center
Water Study
November 2015



HYDRAULIC CONTROL MAP
FIGURE 2

Z:\Projects\IS\Kilroy\mxd\Hydraulic Control.mxd

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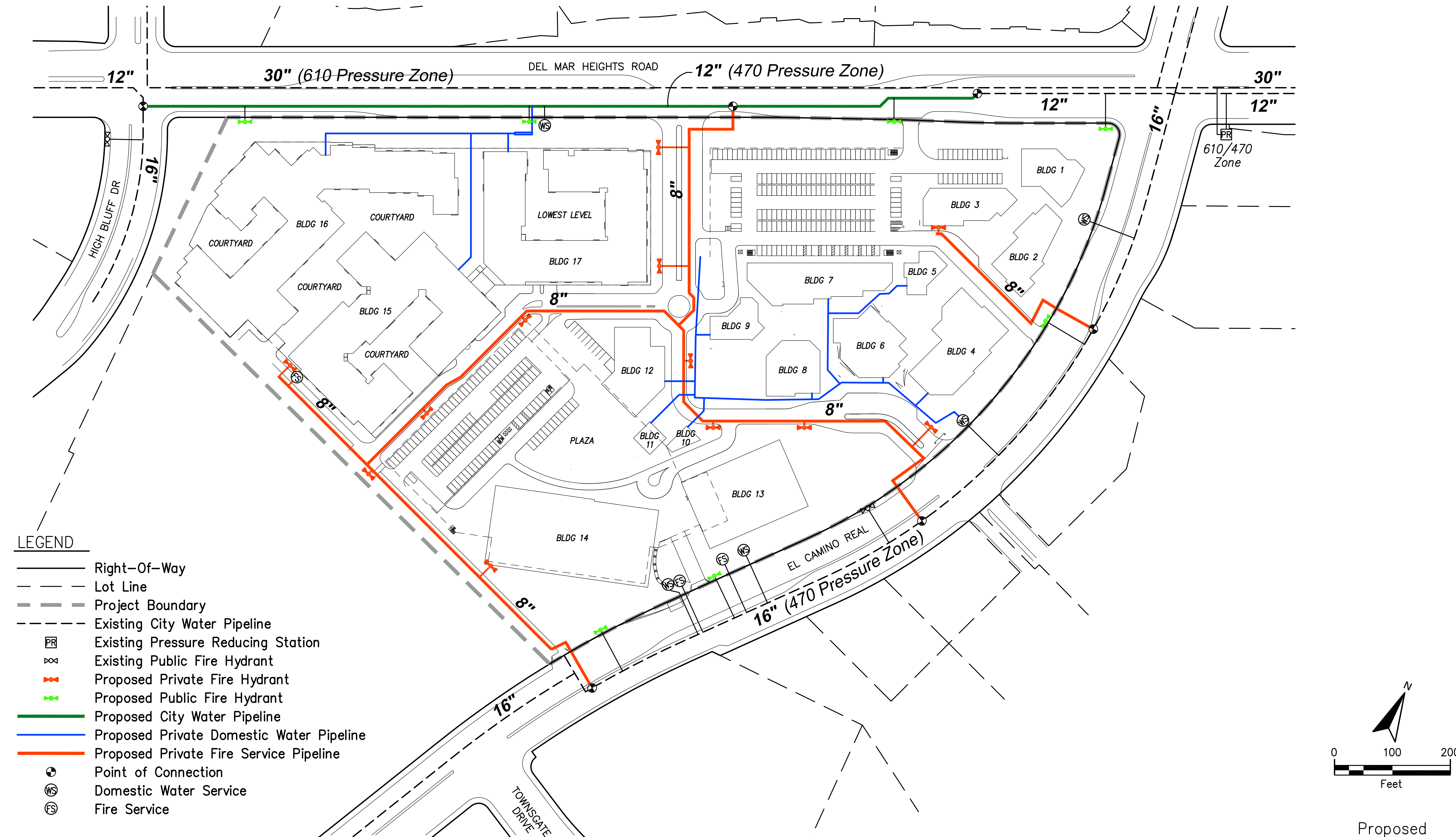
SDCC Water Study
November 2015



Proposed Water System

Figure 1

\\sdofs01\Data\Clients\Kilroy\100008492 New One Paseo\Graphics\CADD\100008492_Water Syst.dwg 12/18/15

ATKINS

New One Paseo
November 2015

APPENDIX A
HYDRAULIC MODEL DATA

TABLE A-1A

MAXIMUM DAY DEMANDS PLUS 4,000 GPM FIRE FLOW

(J120 and J122)

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J100	-	200.00	438.99	103.55
J102	-	200.00	439.29	103.68
J104	-	209.30	446.81	102.91
J106	-	200.00	448.82	107.81
J108	-	200.00	461.09	113.13
J110	-	200.00	463.30	114.09
J112	-	200.00	464.94	114.80
J114	-	240.00	460.62	95.59
J116	420	265.13	460.22	84.53
J118	-	200.00	415.00	93.16
J120	2,000	200.00	383.42	79.48
J122	2,000	204.45	366.97	70.42
J124	-	200.00	415.37	93.32
J126	-	200.00	417.31	94.16
J128	1,050	200.00	456.03	110.94
J130	243.4	240.00	460.56	95.57
J132	-	200.00	467.80	116.04
J134	16.0	200.71	463.77	113.98
J138	53.6	200.00	456.97	111.35
J76	-	200.00	463.77	114.29
J78	-	200.00	463.77	114.29
J80	-	200.00	463.77	114.29
J82	-	200.00	463.77	114.29
J84	-	200.00	459.59	112.48
J86	-	200.00	450.04	108.34
J88	-	200.00	448.77	107.79
J90	-	200.00	447.00	107.02
J92	-	200.00	440.95	104.40
J94	-	200.00	440.04	104.01
J96	-	200.00	437.43	102.88
J98	-	200.00	438.41	103.30

TABLE A-1B

MAXIMUM DAY DEMANDS PLUS 4,000 GPM FIRE FLOW

(J120 and J122)

ID	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/k-ft)
P101	J80	J82	44.82	8	120	0.00	0	0	0
P103	J82	J76	229.49	8	120	0.00	0	0	0
P105	J112	J110	188.76	12	120	1,795.01	5.09	1.64	8.69
P107	J110	J108	254.33	12	120	1,795.01	5.09	2.21	8.69
P109	J108	J106	39.44	8	120	1,131.62	7.22	12.28	311.28
P111	J106	J104	75.32	8	120	1,131.62	7.22	2.01	26.64
P113	J104	J102	282.38	8	120	1,131.62	7.22	7.52	26.64
P115	J102	J100	11.37	8	120	1,131.62	7.22	0.3	26.64
P117	J100	J98	21.7	8	120	1,131.62	7.22	0.58	26.64
P119	J98	J96	36.73	8	120	1,131.62	7.22	0.98	26.64
P121	J96	J94	135.63	8	120	948.98	6.06	2.61	19.23
P123	J94	J92	47.55	8	120	948.98	6.06	0.91	19.23
P125	J92	J90	314.54	8	120	948.98	6.06	6.05	19.23
P127	J90	J88	92.3	8	120	948.98	6.06	1.77	19.23
P129	J88	J86	66.06	8	120	948.98	6.06	1.27	19.23
P131	J84	J86	85.83	8	120	948.98	6.06	9.55	111.21
P133	J116	J114	671.49	12	120	420.00	1.19	0.4	0.59
P135	J114	J108	346.79	12	120	663.39	1.88	0.48	1.37
P137	J114	J130	36.02	8	120	243.39	1.55	0.06	1.55
P139	J96	J118	272.61	8	120	2,080.60	13.28	22.43	82.28
P141	J118	J120	383.77	8	120	2,080.60	13.28	31.58	82.28
P143	J122	J120	215.15	8	120	2,000.00	12.77	16.45	76.48
P145	J120	J124	450.79	8	120	1,919.40	12.25	31.95	70.87
P147	J124	J126	27.39	8	120	1,919.40	12.25	1.94	70.87
P149	J128	J126	90.64	8	120	1,919.40	12.25	38.72	427.21
P151	J132	J112	328.47	12	120	1,795.01	5.09	2.85	8.69
P153	J132	J134	429.08	16	120	3,988.04	6.36	4.03	9.38
P155	J134	J78	72.11	8	120	0.00	0	0	0
P157	J134	J84	448.87	16	120	3,972.02	6.34	4.18	9.31
P159	J84	J138	466.37	16	120	3,023.03	4.82	2.62	5.62
P165	RES9002	J132	118.04	16	120	5,783.05	9.23	2.2	18.67
P167	J138	J128	172.96	16	120	2,969.40	4.74	0.94	5.43
P99	J78	J80	27.78	8	120	0.00	0	0	0

TABLE A-2A

MAXIMUM DAY DEMANDS PLUS 4,000 GPM FIRE FLOW

(J76 and J100)

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J100	2,000.00	200	449.78	108.23
J102	0.00	200	449.96	108.31
J104	0	209.3	454.5	106.24
J106	0	200	455.71	110.8
J108	0	200	462.84	113.89
J110	0	200	464.48	114.6
J112	0	200	465.69	115.12
J114	0	240	462.37	96.35
J116	420	265.13	461.97	85.29
J118	0	200	452.95	109.6
J120	0	200	455.19	110.58
J122	0	204.45	455.19	108.65
J124	0	200	457.83	111.72
J126	0	200	457.99	111.79
J128	1,050.00	200	460.71	112.97
J130	243.39	240	462.31	96.33
J132	0	200	467.8	116.04
J134	16.02	200.71	463.25	113.76
J138	53.63	200	460.99	113.09
J76	2,000.00	200	399.56	86.47
J78	0	200	422.67	96.48
J80	0	200	420.54	95.56
J82	0	200	417.12	94.08
J84	0	200	461.8	113.44
J86	0	200	457.42	111.54
J88	0	200	456.81	111.28
J90	0	200	455.96	110.91
J92	0	200	453.05	109.64
J94	0	200	452.61	109.45
J96	0	200	451.35	108.91
J98	0	200	450.36	108.48

TABLE A-2B

MAXIMUM DAY DEMANDS PLUS 4,000 GPM FIRE FLOW

(J76 and J100)

ID	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/k-ft)
P101	J80	J82	44.82	8	120	2,000.00	12.77	3.43	76.48
P103	J82	J76	229.49	8	120	2,000.00	12.77	17.55	76.48
P105	J112	J110	188.76	12	120	1,524.66	4.33	1.21	6.42
P107	J110	J108	254.33	12	120	1,524.66	4.33	1.63	6.42
P109	J108	J106	39.44	8	120	861.27	5.5	7.14	180.95
P111	J106	J104	75.32	8	120	861.27	5.5	1.21	16.07
P113	J104	J102	282.38	8	120	861.27	5.5	4.54	16.07
P115	J102	J100	11.37	8	120	861.27	5.5	0.18	16.06
P117	J100	J98	21.7	8	120	1,138.73	7.27	0.58	26.95
P119	J98	J96	36.73	8	120	1,138.73	7.27	0.99	26.95
P121	J96	J94	135.63	8	120	639.38	4.08	1.25	9.25
P123	J94	J92	47.55	8	120	639.38	4.08	0.44	9.25
P125	J92	J90	314.54	8	120	639.38	4.08	2.91	9.25
P127	J90	J88	92.3	8	120	639.38	4.08	0.85	9.25
P129	J88	J86	66.06	8	120	639.38	4.08	0.61	9.25
P131	J84	J86	85.83	8	120	639.38	4.08	4.38	51.01
P133	J116	J114	671.49	12	120	420	1.19	0.4	0.59
P135	J114	J108	346.79	12	120	663.39	1.88	0.48	1.37
P137	J114	J130	36.02	8	120	243.39	1.55	0.06	1.55
P139	J96	J118	272.61	8	120	499.34	3.19	1.6	5.85
P141	J118	J120	383.77	8	120	499.34	3.19	2.25	5.85
P143	J122	J120	215.15	8	120	0	0	0	0
P145	J120	J124	450.79	8	120	499.34	3.19	2.64	5.85
P147	J124	J126	27.39	8	120	499.34	3.19	0.16	5.85
P149	J128	J126	90.64	8	120	499.34	3.19	2.72	29.97
P151	J132	J112	328.47	12	120	1,524.66	4.33	2.11	6.42
P153	J132	J134	429.08	16	120	4,258.39	6.8	4.55	10.59
P155	J134	J78	72.11	8	120	2,000.00	12.77	40.58	562.78
P157	J134	J84	448.87	16	120	2,242.36	3.58	1.45	3.23
P159	J84	J138	466.37	16	120	1,602.98	2.56	0.81	1.73
P165	RES9002	J132	118.04	16	120	5,783.05	9.23	2.2	18.67
P167	J138	J128	172.96	16	120	1,549.34	2.47	0.28	1.63
P99	J78	J80	27.78	8	120	2,000.00	12.77	2.12	76.48

TABLE A-3A

PEAK HOUR DEMANDS

ID	Demand (gpm)	Elevation (ft)	Head (ft)	Pressure (psi)
J100	0.00	200	464.52	114.62
J102	0	200	464.52	114.62
J104	0	209.3	464.52	110.59
J106	0	200	464.52	114.62
J108	0.00	200	462.98	113.95
J110	0	200	464.85	114.76
J112	0	200	466.24	115.36
J114	0	240	460.42	95.51
J116	1,040.00	265.13	458.3	83.7
J118	0	200	464.52	114.62
J120	0	200	464.52	114.62
J122	0	204.45	464.52	112.69
J124	0	200	464.52	114.62
J126	0	200	464.52	114.62
J128	2,600.00	200	461.61	113.36
J130	602.68	240	460.12	95.38
J132	0	200	468.66	116.41
J134	39.68	200.71	466.61	115.21
J138	132.81	200	462.35	113.67
J76	0	200	466.61	115.52
J78	0	200	466.61	115.52
J80	0	200	466.61	115.52
J82	0	200	466.61	115.52
J84	0	200	464.52	114.62
J86	0	200	464.52	114.62
J88	0	200	464.52	114.62
J90	0	200	464.52	114.62
J92	0	200	464.52	114.62
J94	0	200	464.52	114.62
J96	0	200	464.52	114.62
J98	0	200	464.52	114.62

TABLE A-3B

PEAK HOUR DEMANDS

ID	From Node	To Node	Length (ft)	Diameter (in)	Roughness	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	HL/1000 (ft/k-ft)
P101	J80	J82	44.82	8	120	0.00	0	0	0
P103	J82	J76	229.49	8	120	0.00	0	0	0
P105	J112	J110	188.76	12	120	1,642.68	4.66	1.39	7.37
P107	J110	J108	254.33	12	120	1,642.68	4.66	1.87	7.37
P109	J108	J106	39.44	8	120	0.00	0	0	0
P111	J106	J104	75.32	8	120	0.00	0	0	0
P113	J104	J102	282.38	8	120	0.00	0	0	0
P115	J102	J100	11.37	8	120	0.00	0	0	0
P117	J100	J98	21.7	8	120	0.00	0	0	0
P119	J98	J96	36.73	8	120	0.00	0	0	0
P121	J96	J94	135.63	8	120	0	0	0	0
P123	J94	J92	47.55	8	120	0	0	0	0
P125	J92	J90	314.54	8	120	0	0	0	0
P127	J90	J88	92.3	8	120	0	0	0	0
P129	J88	J86	66.06	8	120	0	0	0	0
P131	J84	J86	85.83	8	120	0	0	0	0
P133	J116	J114	671.49	12	120	1,040.00	2.95	2.12	3.16
P135	J114	J108	346.79	12	120	1,642.68	4.66	2.56	7.37
P137	J114	J130	36.02	8	120	602.68	3.85	0.3	8.29
P139	J96	J118	272.61	8	120	0	0	0	0
P141	J118	J120	383.77	8	120	0	0	0	0
P143	J122	J120	215.15	8	120	0	0	0	0
P145	J120	J124	450.79	8	120	0	0	0	0
P147	J124	J126	27.39	8	120	0	0	0	0
P149	J128	J126	90.64	8	120	0	0	0	0
P151	J132	J112	328.47	12	120	1,642.68	4.66	2.42	7.37
P153	J132	J134	429.08	16	120	2,772.48	4.42	2.05	4.79
P155	J134	J78	72.11	8	120	0	0	0	0
P157	J134	J84	448.87	16	120	2,732.81	4.36	2.09	4.66
P159	J84	J138	466.37	16	120	2,732.81	4.36	2.17	4.66
P165	RES9002	J132	118.04	16	120	4,415.16	7.05	1.34	11.33
P167	J138	J128	172.96	16	120	2,600.00	4.15	0.73	4.25
P99	J78	J80	27.78	8	120	0	0	0	0

Date: 11/18/2015 S:\Clients\Kilroy\100008492 New One Paseo\Model\Kilroy Water Model 11-18-2015v1.mxd

Kilroy Pipe & Node Diagram

N

1 inch = 275 feet

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December 8, 2015

Ms. Martha Blake
Development Services Department
City of San Diego
1223 First Avenue
San Diego, CA 92101

Subject: New One Paseo Project
Verification of Water and Sewer System Service

Dear Ms. Blake:

The purpose of this letter is to verify the water demands and sewer flows for the New One Paseo Project are adequate for water, sewer and fire service to the project based on the revised development and to confirm that the analysis and conclusions contained in the original reports (Appendices K and L of the FEIR) for the One Paseo Project remain applicable to the New One Paseo Project.

INTRODUCTION

In February 2015, the City Council approved a development proposal that reflected the Reduced Main Street Alternative included in the FEIR. This project is referred to as the “Approved Project.” The City Council subsequently rescinded some of the project approvals at the request of Kilroy to provide an opportunity to address local community concerns. Kilroy has revised the development proposal to reduce the scale of the project. The redesigned project is referred to as the “New One Paseo Project.”

BACKGROUND

The original water and sewer studies evaluated a development proposal consisting of 1,857,444 gross square feet (gsf) including residential, retail, office and hotel uses. For purposes of this Addendum, this development proposal is referred to as the “Originally Proposed Project.” Subsequent to the preparation of the Draft EIR (DEIR), Kilroy redesigned the project to reduce the development to 1,454,069 gsf. The major changes included elimination of the hotel, reduction in square footage of residential, retail and office uses, and the addition of a green space. An analysis of this redesigned project was included in the EIR as the “Reduced Main Street Alternative,” which was ultimately approved by the City (also referred to as the “Approved Project”).

Subsequent to the approval of the Approved Project, Kilroy has redesigned the development proposal to further reduce the total size of the project to 1,175,871 gsf. More information on the New One Paseo Project is included in the project description section which follows.

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PROJECT DESCRIPTION

The New One Paseo Project retains the residential, retail and office uses, but eliminates the green space that was included in the Approved Project. The total number of residential units would remain 608. However, the square footage of retail and office uses would be reduced from both the Original Project and the Approved Project. **Table 1** and **Figure 1** illustrate the land uses included in the New One Paseo Project.

Table 1. Land Uses

Land Use	Gross Square Footage	Number of Units
Office (Multi-tenant)	280,000	--
Retail	95,871	--
Residential	800,000	608
Total	**1,175,871**	**608**

A comparison of the land uses included in the New One Paseo Project with the Approved Project and the Originally Proposed Project is included in **Table 2.** With respect to the Originally Proposed Project, the New One Paseo Project would result in a 50 percent reduction in the amount of office space, and a 64 percent reduction in the amount of retail space. The number of residential units would remain unchanged. The hotel would be eliminated. The overall square footage would decrease by 37 percent from 1,857,440 to 1,175,871 gsf.

When compared with the Approved Project, the New One Paseo Project would reduce the office space by 43 percent. The retail component would be reduced by 61 percent. The green space would be eliminated. Overall the total square footage of the development would be reduced by 19 percent from 1,454,069 to 1,175,871 gsf. The number of residential units would remain unchanged.

WATER DEMANDS

Projected water demands for the site are shown in **Table 3**. The total average day demand (ADD) for the Approved Project is 283,450 gpd (197 gpm). Based on City Design Criteria, the peaking factors are 2.1 for max day and 5.2 for peak hour. These equate to a maximum day demand (MDD) of 595,250 gpd (413 gpm) and a peak hour (PH) demand of 1,023 gpm. The total average day demand (ADD) for the New One Paseo Project is 214,690 gpd (149 gpm). Based on the City's Design Criteria, the maximum day demand is 450,849 gpd (313 gpm) and a peak hour demand of 775 gpm. Based on the demands shown below, the demands for the New One Paseo Project are reduced from the Approved Project by 24%.

Table 2. Land Use Comparison of the New One Paseo Project with the Originally Proposed Project and Approved Project (Gross Square Feet)

Project	Commercial Retail (Square Feet)		Commercial Office (Square Feet)			Hotel	Green space	Multi-Family Residential (Dwelling Units)		Total
	Retail	Cinema	Corporate[1]	Profes-sional[2]	Multi-tenant	Square Feet	Square Feet	Units	Square Feet	Square Feet
Originally Proposed Project	220,000	50,000	535,600	21,840	0	100,000	0	608	930,000	1,857,440
Approved Project	198,500	48,000	471,000	21,840	0	0	47,916	608	714,729	1,454,069
New One Paseo Project	95,871	0	0	0	280,000	0	0	608	800,000	1,175,871
Net Change from Originally Proposed Project	**-124,129**	**-50,000**	**-535,600**	**-21,840**	**+280,000**	**-100,000**	**0**	**0**	**-130,000**	**-681,569**
Net Change from Approved Project	**-102,629**	**-48,000**	**-471,000**	**-21,840**	**+280,000**	**0**	**-47,916**	**0**	**85,271**	**-278,198**

[1] Corporate office category includes multi-tenant as well as corporate office uses.
[2] Professional office category was applied to multi-tenant office associated with Main Street.

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Table 3. Projected Site Water Demands Comparison

Approved Project

Component	Area/Units	Population Density	Equivalent Population	Unit Rate	Average Demand (gpd)
Retail/Commercial	6.20 ac			5,000 gpd/n-acre	30,990
Hotel	2.30 ac			6,555 gpd/n-acre	15,050
Office	12.30 ac			5,730 gpd/n-acre	70,510
Residential	608 DU	1.83 / DU	1,113	150 gpd/person	166,900
Total					**283,450 gpd**

New One Paseo Project

Component	Area/Units	Population Density	Equivalent Population	Unit Rate	Average Demand (gpd)
Retail/Commercial	2.20 ac			5,000 gpd/n-acre	11,000
Hotel	0 ac			6,555 gpd/n-acre	0
Office	6.42 ac			5,730 gpd/n-acre	36,790
Residential	608 DU	1.83 / DU	1,113	150 gpd/person	166,900
Total					**214,690 gpd**

Notes:
1. Non-residential areas are based on component floor space and are considered a net area.
2. Residential unit demands based on SANDAG multi-family residential density for Carmel Valley (1.83 pph).
3. Retail/Commercial demands based on City of San Diego Design Guidelines.

FIRE FLOW DESIGN CRITERIA

The fire flow for the New One Paseo Project remains the same as in the Approved Project. A summary of criteria used for both the Approved Project and the New One Paseo Project is provided in **Table 4**.

Table 4. City Planning and Design Criteria

Parameter	Criteria
Multi-Family Residential Fire Flow	3,000 gpm
Commercial Fire Flow	4,000 gpm

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SEWER FLOWS

The change in development also has the sewer flows reduced. In the table below is the comparison of the Approved Project with the New One Paseo Project.

Table 5. Average Sewer Generation Comparison

Approved Project

Component	Net Area/Units	Population Density	Equivalent Population	Unit Rate	Average Generation (mgd)
Retail/Commercial	6.20 ac	43.7 pop/n-acre	271	80 gpd/person	0.022
Hotel	2.30 ac	43.7 pop/n-acre	100	80 gpd/person	0.008
Office	12.30 ac	43.7 pop/n-acre	538	80 gpd/person	0.043
Residential	608 DU	1.83 pop/DU	1,113	80 gpd/person	0.089
Total			**2,022**		**0.162**

New One Paseo Project

Component	Net Area/Units	Population Density	Equivalent Population	Unit Rate	Average Generation (mgd)
Retail/Commercial	2.20 ac	43.7 pop/n-acre	96	80 gpd/person	0.008
Hotel	0 ac	43.7 pop/n-acre	0	80 gpd/person	0
Office	6.42 ac	43.7 pop/n-acre	281	80 gpd/person	0.023
Residential	608 DU	1.83 pop/DU	1,113	80 gpd/person	0.089
Total			**1,490**		**0.120**

Notes:
Residential unit demands based on SANDAG multi-family residential density for Carmel Valley (1.83 pph).
Commercial and Office equivalent populations based on City Design Guidelines.
Non-residential areas are based on component floor space and are considered a net area

For the New One Paseo Project, the equivalent population is 1,490 compared with 2,022 for the Approved Project. With a peak dry weather factor (DWF) of 2.29, the result is a peak DWF of 0.275 mgd (0.37 mgd for Approved Project). With a safety factor of 1.1 to account for potential I&I entering the collections system from the New One Paseo Project, which we believe is conservative for a newly constructed sewer system. This results in a peak wet weather factor (WWF) of 0.302 mgd compared with a peak WWF of 0.41 mgd. The New One Paseo Project reduces the sewer flows from Approved Project by 26%.

CONCLUSION

The water demands for New One Paseo are reduced from the Approved Project by 24% and the fireflow demands remain the same. The sewer flows for New One Paseo Project are reduced from the Approved Project by 26%. Therefore the proposed water and sewer systems provided with the Approved Project will be adequate for the New One Paseo Project. The New One Paseo Project would not result in any new impacts related to water and sewer systems, nor would the

New One Paseo Project result in an increase in severity of the impacts identified in our original report for the FEIR.

If you have any questions, please do not hesitate to contact me at 858-514-1042.

Respectfully submitted,
Atkins

Mark B. Elliott, PE
Project Director

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