Appendix L

Traffic Impact Analysis
Schwerin and Associates, June 2015
Kimley Horn & Associates., June 2013

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June 8, 2015

To Whom it May Concern:

The City of San Diego's Transportation Department during its review of the EIR, discovered that the traffic calculations for the Traffic Impact Analysis used "greater than 20 dwelling units per acre" as a basis its calculations; while the Tentative Map used 19.93 (rounded up to 20) dwelling units per acre.

In order for the traffic calculations in the Traffic Impact Analysis report to be accurate and match the EIR, the dwelling units per acre must be "greater than" 20.

Therefore, the Tentative Map was updated to reflect a decrease of .09 acres for the developable acres (Lot 1 was decreased by .09 acres and Lot 4 (MHPA) increased). This increased the dwelling units per acre to 20.008 and required the following changes to the Tentative Map:

Area affected	Previous Tentative Map acres/units	Updated Tentative Map acres/units
Lot 1 acres	7.81 acres	7.72 acres
Dwelling unit per acre	19.93 dwelling units per acre	20.008 dwelling units per acre
Developable acres	23.83 acres	23.74 acres
Lot 4 acres	15.76 acres	15.85 acres
Total open space acres	17.86 acres	17.95 acres
Total open space rounded	17.9 acres	18 acres
Total developable acres rounded	23.8 acres	23.7 acres

This update to the Tentative Map made the environmental impact LESS than previously stated. Therefore, it was determined that the reports for this EIR would not need to be re-written/updated to reflect this negligible change of .09 acres on the Tentative Map.

Also note, some reports state that 476 dwelling units would be built and others studied impacts of 475 units. Therefore, 475 dwelling units will be used to be consistent. Some reports may show 476 units. The lower dwelling unit number would cause LESS of an environmental impact.

The attached report may have acres/units which do not reflect the latest Tentative Map updates described above. However, please note the current impact is less that the report may state and therefore, not considered a significant change requiring a report re-write.

Sincerely,

Kathy Corvin

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Traffic Impact Analysis

Candlelight

PTS# 40329
IO# 24002388

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June 2013

KHA NO. 095809001

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EXECUTIVE SUMMARY

This study, prepared by Kimley-Horn and Associates, Inc., evaluates the potential off site traffic-related impacts associated with the proposed Candlelight project. The project site is located along Caliente Avenue south of Airway Road in the community of Otay Mesa, San Diego. Candlelight is a multi-family residential community with 475 dwelling units at a density of over 20 dwelling units per acre. Public Street A will be constructed at the southern end of Caliente Avenue as part of the project and will provide access to the site. The project's anticipated opening day is in the Year 2014.

It should be noted that a traffic study was prepared for this project in June 2006. The study was approved by the City of San Diego, however, changes to the street network, cumulative project description, and the Candlelight project description required that a new traffic study be prepared.

The proposed project would generate a total of 2,850 new daily trips, including 228 (46 in, 182 out) a.m. peak-hour trips, and 257 (180 in, 77 out) p.m. peak-hour trips.

The project distribution for the Existing and Near Term roadway network scenarios was estimated based on traffic distribution patterns used in the Traffic Impact Study prepared for the Southview project (final study dated November 15th, 2011). The distribution for both studies is the same since both projects have the same land use definition and the roadway segment networks are the same.

For the Horizon Year scenarios, a Series 11 Select Zone model run was obtained for the project and provided by the City of San Diego. The distribution for the Horizon Year scenario is different from the Near Term scenario because of land use and roadway network changes expected for the Horizon Year conditions based on the City's Adopted Community Plan and Public Facilities Financing Plan for the Otay Mesa community.

Based on the project traffic distribution and assignment, the following intersections were included as part of the study area:

- Otay Mesa Rd and Caliente Ave/Ocean View Hills Pkwy (signalized);
- Caliente Ave and SR-905 WB Ramps (signalized);
- Caliente Ave and SR-905 EB Ramps (signalized);
- Caliente Ave and Airway Rd (all-way stop controlled); and
- Caliente Ave and Public Street A (two-way stop controlled-for with project conditions.)

In addition, the following roadway segments were included in the study area:

- Otay Mesa Rd between Caliente Ave and Heritage Rd;
- Caliente Ave between Otay Mesa Rd and SR-905;
- Caliente Ave between SR-905 and Airway Rd;
- Caliente Ave between Airway Rd and Public St A; and
- Airway Rd between Old Otay Mesa Rd and Caliente Ave.

Intersecting Lane Volume (ILV) analysis and ramp metering analysis was also done at each of the SR-905 intersections with Caliente Avenue. Additionally, freeway segment analysis was done on two segments of SR-905, east and west of Caliente Avenue.

Under Existing Plus Project conditions, the proposed Candlelight project was not found to have a significant direct traffic related impact at any of the intersections, roadway segments or freeway segments within the study area.

Under Near Term Plus Project conditions, the proposed Candlelight project was found to have a significant direct traffic related impact at the **Otay Mesa Road** and **Caliente Avenue** intersection and at the **Airway Road** and **Caliente Avenue** intersection. To mitigate the direct impact at the Otay Mesa Road and Caliente Avenue intersection, the project will remove the crosswalk on the south leg of the intersection, add a crosswalk on the west leg of the intersection, and adjust the signal timing to provide additional green time to the westbound left-turn lane. To mitigate the direct traffic related impact at the Airway Road and Caliente Avenue intersection, the proposed project would construct a traffic signal at this intersection. It is assumed that the widening of Caliente Avenue as a 5-lane major arterial south of Airway Road, as well as the construction of the east leg of the intersection as a four-lane major arterial will be completed by the Southview project. A tentative map for the Southview project was approved by City Council in September 2012. If roadway widening improvements at the intersection of Caliente Avenue and Airway Road are not completed prior to the installation of the traffic signal, those improvements will be the responsibility of the Candlelight project.

Under Horizon Year Plus Project conditions, the proposed Candlelight project was found to have significant cumulative traffic impacts at the following intersections:

- Otay Mesa Road and Caliente Avenue;
- SR-905 Westbound Ramps and Caliente Avenue; and
- Caliente Avenue and Public Street A.

To mitigate its significant cumulative traffic impact at the **Otay Mesa Road** and **Caliente Avenue** intersection, the proposed project will be responsible for its fair-share contribution of **5.23**-percent of installing an overlap phase for the northbound right-turn movement. To mitigate its significant cumulative traffic impact at the **SR-905 WB Ramps** and **Caliente Avenue** intersection, the proposed project could pay its fair-share contribution of **7.65**-percent toward the addition of an exclusive southbound right-turn lane, and the restriping of Caliente Avenue to provide a second southbound right-turn lane and a second northbound left-turn lane at the intersection. However, these impact are considered unmitigated since there are not currently planned or funded projects to expand the SR-905/Caliente Avenue interchange. To mitigate its significant cumulative traffic impact at the **Caliente Avenue** and **Public Street A** intersection, the proposed project will install a traffic signal when it becomes warranted. Installing these improvements would improve the operations to better than before project's condition.

The project was found to have a cumulative impact along SR-905 between Caliente Avenue and Britannia Boulevard. These impacts are considered unmitigated since there are not currently planned or funded projects to expand SR-905 by SANDAG or Caltrans to which the project could pay a fair share contribution toward the improvements.

The project was also found to have a cumulative ramp meter impact at the SR-905/Caliente Avenue WB on-ramp under the Horizon Year conditions. To mitigate its significant cumulative traffic impact, the proposed project could pay its fair-share contribution of **2.60**-percent toward the construction for widening the ramp to accommodate two lanes. However, these impacts are considered unmitigated since there are not currently planned or funded projects to expand this ramp. The ramp expansion would require a reconfiguration of the SR-905/Caliente Avenue interchange.

1.0 INTRODUCTION

The following transportation impact study has been prepared to determine and evaluate the potential impacts associated with the proposed Candlelight project. **Figure 1-1** depicts the location of the project site in a regional context.

Project Description

The project site is a 16-acre site located along Caliente Avenue south of Airway Road in the community of Otay Mesa, San Diego. Candlelight is a multi-family residential community with 475 dwelling units at a density of over 20 dwelling units per acre. Public Street A will be constructed at the southern end of Caliente Avenue as part of the project and will provide access to the site. **Figure 1-2** shows the proposed site plan for the project. The project is consistent with the land use designation included in the Adopted Otay Mesa Community Plan. The site is zoned as an RM 2-5, which allows for 1 multi-family dwelling unit for every 1,500 square feet of lot area. A rezone is not required for this project.

Analysis Scenarios

A total of six scenarios were analyzed as part of the project, which are listed below:

- ***Existing Conditions (2012)***
  - *Existing Conditions*: Represents the traffic conditions of the existing street network.
  - *Existing with Project Conditions*: Represents the existing traffic conditions with the addition of the proposed project. Project impacts under this scenario are considered direct impacts.

- ***Near Term Conditions (2014)***
  - *Near Term Baseline Conditions*: Represents the traffic conditions of the street network assumed to be in place in the Near Term without project baseline. This scenario includes projected traffic growth to account for other potential projects in the study area.
  - *Near Term with Project Conditions*: Represents the Near Term traffic conditions with the addition of the proposed project. Comparison of this scenario to the Near Term Baseline Conditions scenario will determine direct project traffic impacts under the Near Term conditions for the facilities analyzed. Project impacts under this scenario are considered direct impacts.

- ***Horizon Year Conditions (2035)***
  - *Horizon Year Baseline Conditions*: Represents the traffic conditions of the street network assumed to be in place under Horizon Year conditions.
  - *Horizon Year with Project Conditions*: Represents the Horizon Year traffic conditions with the addition of the proposed project. Comparison of this scenario to the Horizon Year Baseline Conditions scenario will determine cumulative project traffic impacts under the Horizon Year conditions for the facilities analyzed. Project impacts under this scenario are considered cumulative impacts.

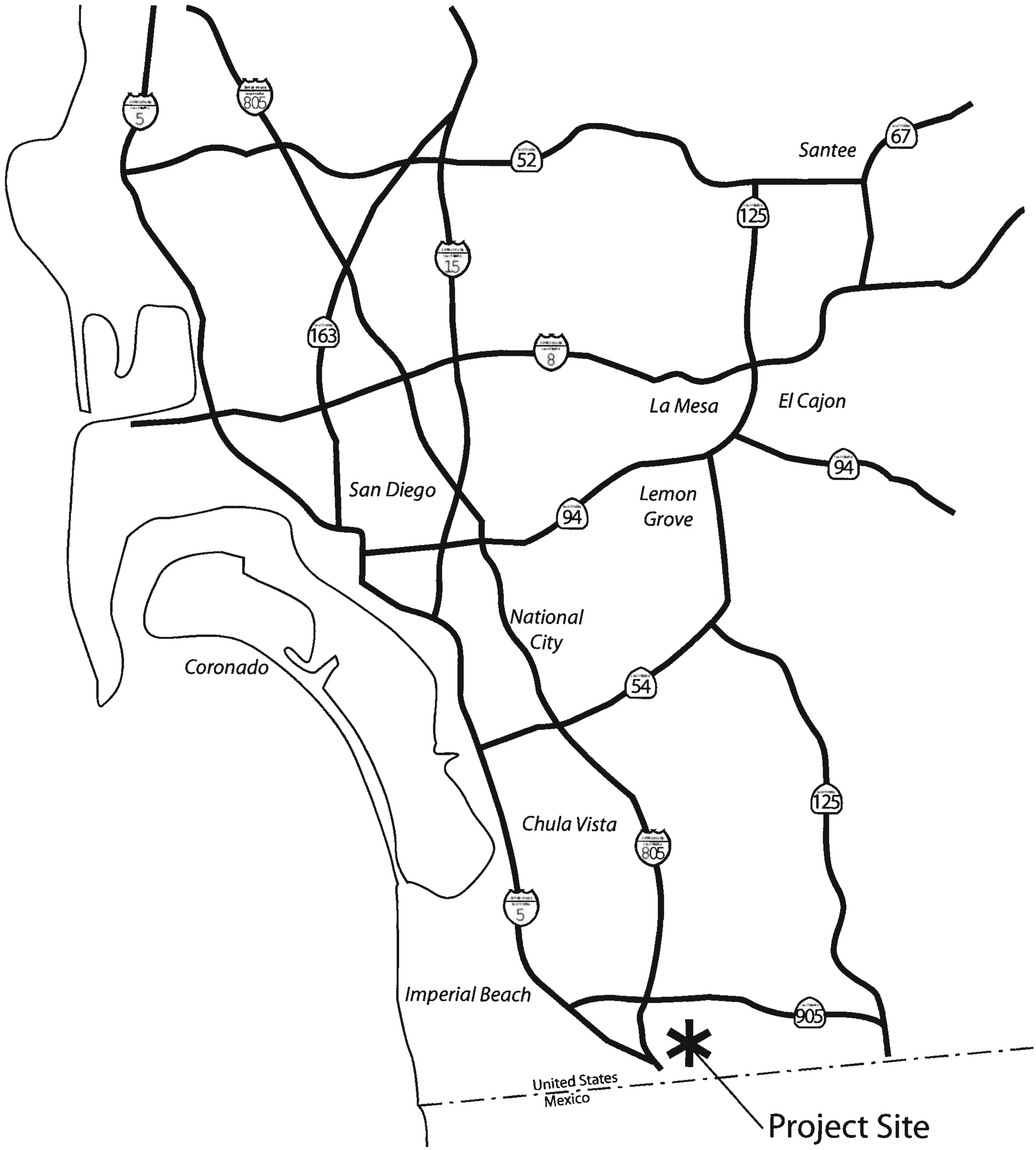
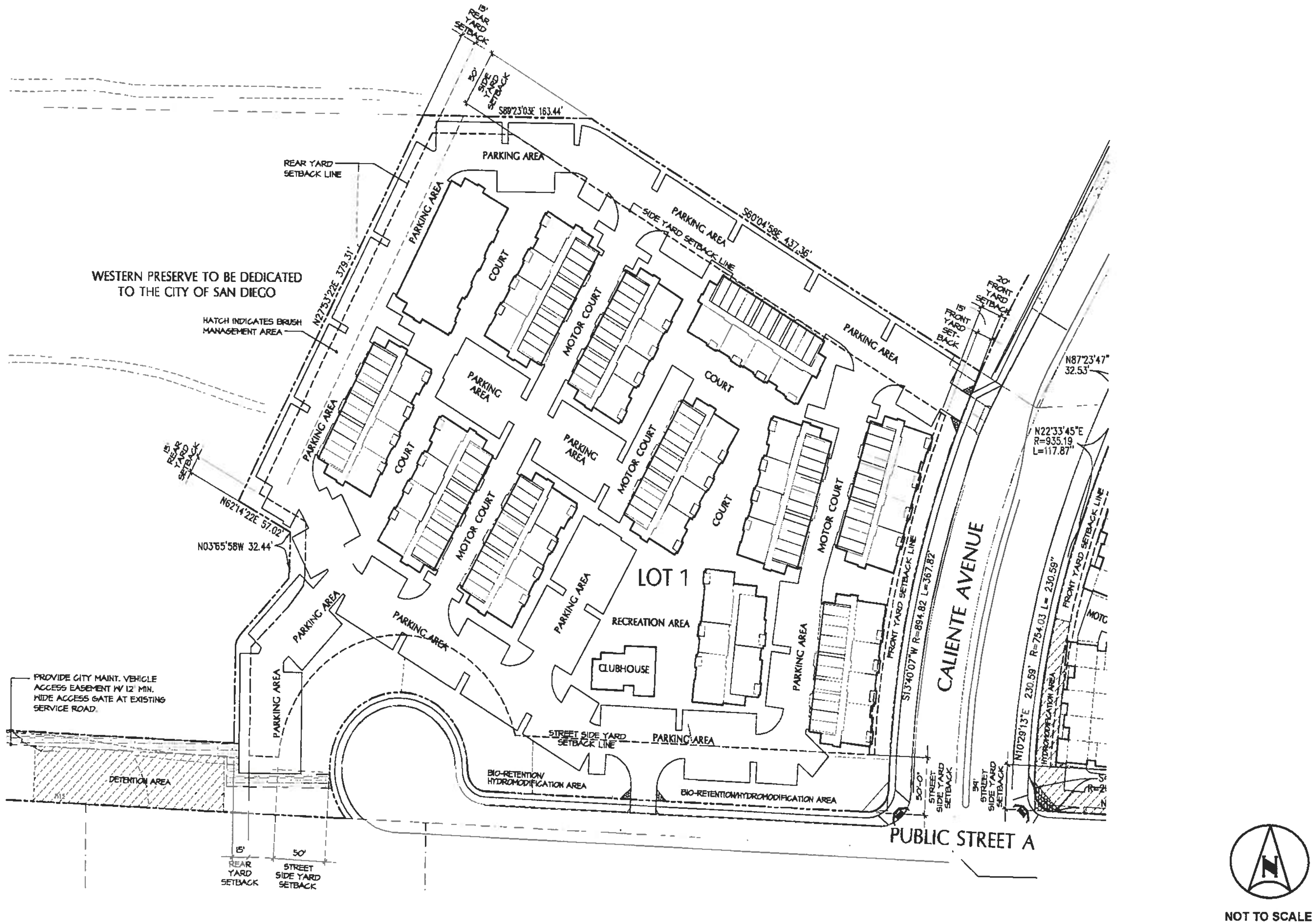


FIGURE 1-1
Regional Vicinity Map



Kimley-Horn and Associates, Inc.

FIGURE 1-2.1
Proposed Site Plan (Lot 1)

K:\SND_TPTO\095809001-Candlelight\Illustrator\SITE PLAN Lot 1.ai

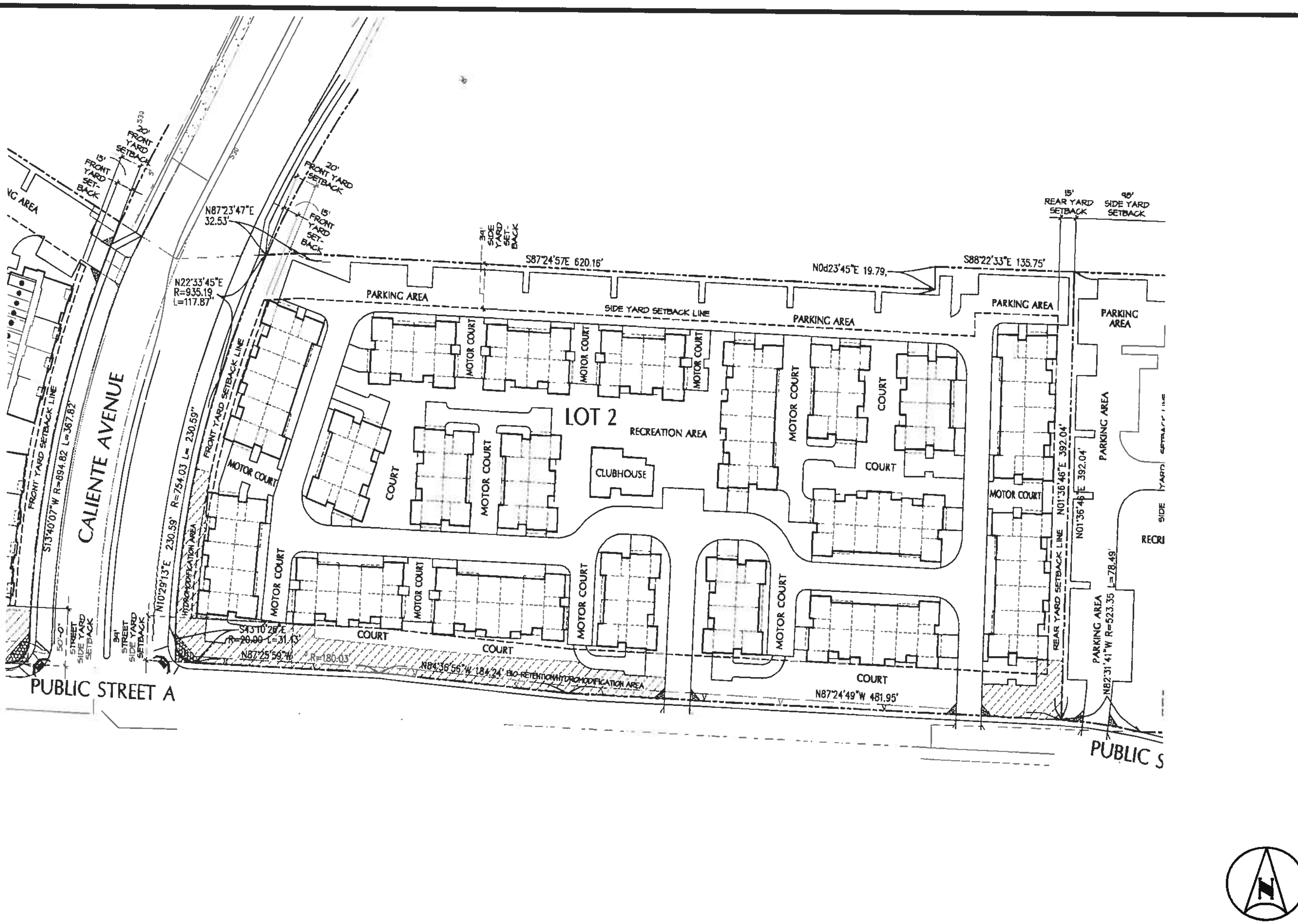


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FIGURE 1-2.2

Proposed Site Plan (Lot 2)

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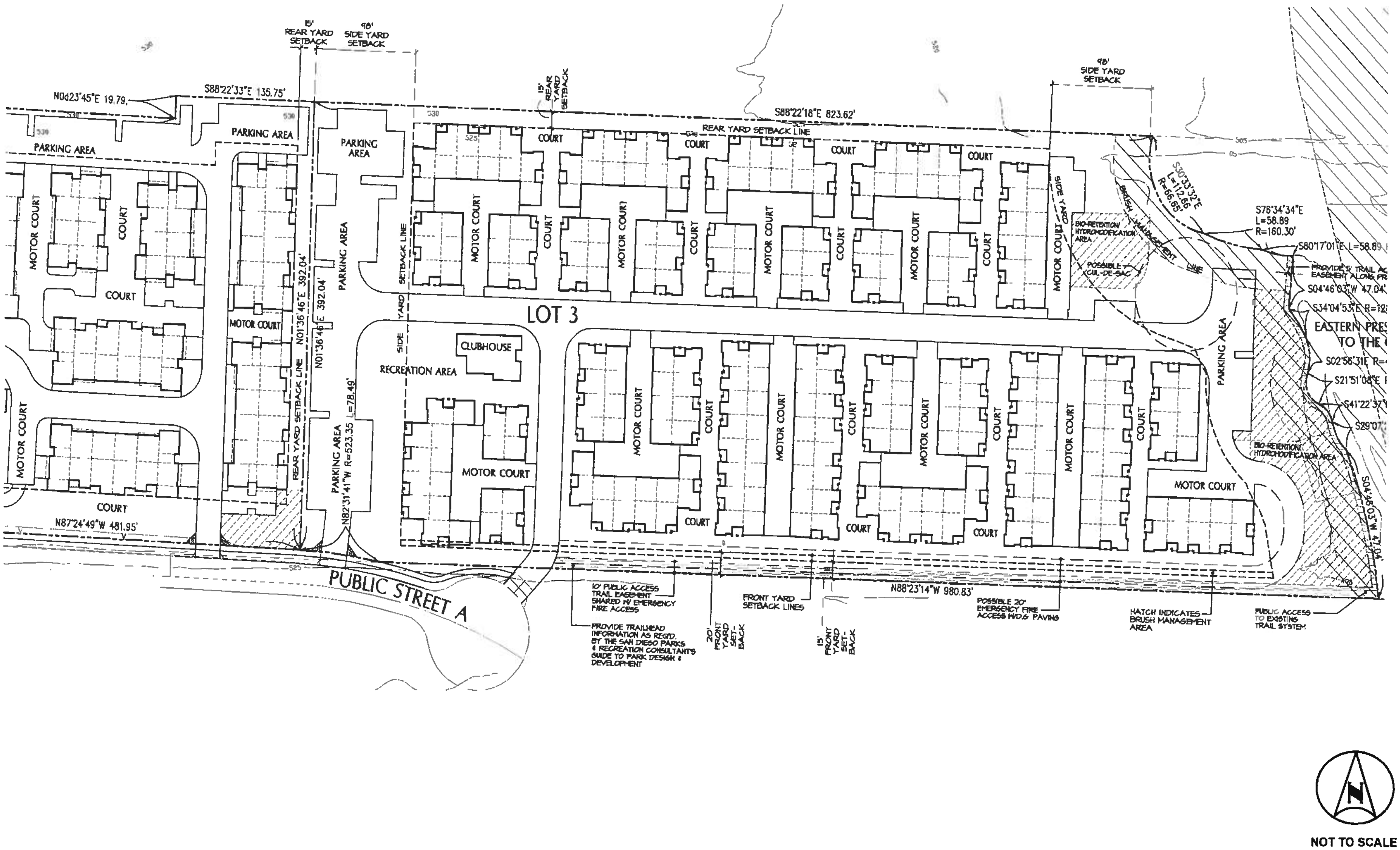


Kimley-Horn and Associates, Inc.

FIGURE 1-2.3

Proposed Site Plan (Lot 3)

K:\SND_TPTO\095809001-Candlelight\Illustrator\SITE PLAN Lot 3.ai.ai

2.0 METHODOLOGY

The following section describes the methodology used to forecast traffic data, determine study intersections, perform capacity analysis, and determine significant impacts.

Traffic Volume Forecasting

The Horizon Year Baseline peak-hour volumes at the study intersections and the Average Daily Traffic (ADT) volumes on the study roadway segments were extracted from the Series 11 Forecast Model prepared for the City of San Diego based on the land uses included in the Adopted Otay Mesa Community Plan. The volumes included in the Forecast Model represent the future buildout conditions of the Otay Mesa Community that for planning purposes is expected by the Year 2050. To estimate the Year 2035 volumes (Horizon Year project conditions), the Buildout volumes were reduced linearly between the year 2014 and 2050. A copy of the forecast model plot showing the forecasted ADT volumes is included in **Appendix A.**

To estimate the Horizon Year turning movement volumes at the study intersections, the existing turning movements at each respective study intersection were factored up based on the projected Average Daily Traffic (ADT) volumes along each segment. Each respective movement was derived using an iterative approach that balances the inflows and outflows for each approach. The input values include the existing turning movement volumes and future year peak-hour approach and departure volumes along each leg of the intersection. The future peak-hour approach volumes would be estimated by applying the existing peak-hour factor (K-factor) and directional distributional percentage (D-factor) to the future ADT volumes along each approach. A more detailed description of the methodology used to forecast turning movement volumes is contained in National Cooperative Highway Research Program (NCHRP) 255 Highway Traffic Data for Urbanized Area Project Planning and Design, Chapter 8. An Excel model computes the forecast turning volumes from existing turning movement volumes and forecasted approach and departure volumes by the techniques described in NCHRP 255. As a conservative approach, if a turning movement volume produced by this model was less than the existing count for that movement, manual adjustments were made to assure that all forecast horizon year volumes would be equal or greater than the existing turning movement counts. A copy of the excel calculation worksheets are included in **Appendix A**.

Near Term 2014 Baseline peak-hour volumes at the study intersections and the ADT volumes on the study roadway segments were determined by adding the reasonably expected cumulative project volumes to the existing traffic volumes. Chapter 5 includes a more detailed description of the cumulative projects included in the study.

Study Intersections

The study area was defined based on likely project traffic patterns and procedures summarized in the City of San Diego's *Traffic Impact Study Manual,* July 1998. The intersections listed in **Table 2-1** were identified for evaluation because they represent primary ingress/egress to and from the project site and the surrounding community.

As shown in Table 2-1, the Caliente Avenue and Airway Road intersection is stop controlled along with the future intersection of Caliente Avenue and Public Street A. The other three intersections are signalized. Public Street A will be constructed at the southern end of Caliente Avenue as part of the project and will provide access to the site; intersection 5 will exist for with-project conditions only. All study intersections are located within the City of San Diego's limits. Intersections 1, 2 and 3 are currently controlled by Caltrans.

Level of service (LOS) for signalized intersections is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption, and loss of travel time. Specifically, LOS criteria are stated in terms of the average control delay per vehicle for the peak 15-minute period within the hour analyzed. The average control delay includes initial deceleration delay, queue move-up time, and final acceleration time in additional to the stop delay. The level of service for unsignalized intersections is determined by the computed or measured control delay and is defined for each minor movement. The criteria for the various levels of service designations for signalized and unsignalized intersections are given in **Table 2-2**.

TABLE 2-1
STUDY INTERSECTIONS

	Intersection	Traffic Control
1	Otay Mesa Rd and Caliente Ave/Ocean View Hills Pkwy	Traffic Signal
2	Caliente Ave and SR-905 WB Ramps	Traffic Signal
3	Caliente Ave and SR-905 EB Ramps	Traffic Signal
4	Caliente Ave and Airway Rd	All Way Stop Controlled
5	Caliente Ave and Public Street A (Project Driveway)	Two-Way Stop Controlled

Analysis Process

The analysis process includes determining the a.m. and p.m. peak-hour operations at the study intersections and operations daily along the roadway segments. Intersections will be measured and quantified by using the Synchro traffic analysis software package. Results will be compared to the City's thresholds and determined if the project has any significant traffic impacts.

Analysis Software

To analyze the operations of both signalized and unsignalized intersections, Synchro 7.0 (Trafficware) was used for the analysis. Synchro 7.0 uses the methodologies outlined in the 2000 *Highway Capacity Manual (HCM)*. The existing intersection peak-hour factor (PHF) was used for Existing and Near Term scenarios. A PHF of 0.92 was used for Horizon Year conditions to account for the unknown change in traffic patterns.

For the peak-hour operations evaluation, it was assumed that all signalized intersection along Caliente Avenue are operating in a coordinated system with optimized cycle lengths for each scenario. Existing traffic signal timing parameters were provided by Caltrans and included in **Appendix I.**

Signalized and Unsignalized Intersections

The 2000 *Highway Capacity Manual (HCM)* published by the Transportation Research Board establishes a system whereby highway facilities are rated for their ability to process traffic volumes. The terminology "level of service" is used to provide a "qualitative" evaluation based on certain "quantitative" calculations, which are related to empirical values.

TABLE 2-2
LEVEL OF SERVICE (LOS) CRITERIA FOR SIGNALIZED AND UNSIGNALIZED INTERSECTIONS

LOS	Signalized (Control Delay) (sec/veh)(a)	Unsignalized (Average control delay) (sec/veh)(b)	Description
A	≤10.0	≤10.0	Operations with very low delay and most vehicles do not stop.
B	>10.0 and ≤20.0	>10.0 and ≤15.0	Operations with good progression but with some restricted movement.
C	>20.0 and ≤35.0	>15.0 and ≤25.0	Operations where a significant number of vehicles are stopping with some backup and light congestion.
D	>35.0 and ≤55.0	>25.0 and ≤35.0	Operations where congestion is noticeable, longer delays occur, and many vehicles stop. The proportion of vehicles not stopping declines
E	>55.0 and ≤80.0	>35.0 and ≤50.0	Operations where there is significant delay, extensive queuing, and poor progression.
F	>80.0	>50.0	Operations that are unacceptable to most drivers, when the arrival rates exceed the capacity of the intersection.

Source:
(a) 2000 Highway Capacity Manual, Chapter 16, Page 2, Exhibit 16-2
(b) 2000 Highway Capacity Manual, Chapter 17, Page 2, Exhibit 17-2

Within the City of San Diego, all signalized and unsignalized intersections are considered deficient if they operate at LOS E or F.

Intersecting Lane Vehicle Analysis

A ramp intersection analysis must be performed at each Caltrans-owned signalized intersection affected by the project using the intersecting lane vehicle (ILV) procedure, which is discussed in further detail from the Caltrans Highway Design Manual Topic 406, page 400-23. The ILV analysis is used to estimate the capacity of a signalized intersection when the phasing is relatively simple. The intersection is considered to be at capacity when the ILV is 1,500 vehicles per hour. **Table 2-3** describes the traffic flow conditions at ramp intersections at various levels of operations.

TABLE 2-3
ILV CRITERIA AT RAMP INTERSECTIONS

ILV/hr (a)	Result	Description
< 1200	Below Capacity	Stable flow with slight, but acceptable delay. Occasional signal loading may develop. Free mid-block operations.
1200 – 1500	Approaching Capacity	Unstable flow with considerable delays possible. Some vehicles occasionally wait two or more cycles to pass through the intersection. Continuous backup occurs on some approaches.
> 1500	Above Capacity	Stop-and-go operation with severe delay and heavy congestion[b]. Traffic volume is limited by maximum discharge rates of each phase. Continuous backup in varying degrees occurs on all approaches. Where downstream capacity is restrictive, mainline congestion can impede orderly discharge through the intersection.

Notes:
Based on the Caltrans Highway Design Manual, Table 406 "Traffic Flow Conditions at Intersections at Various Levels of Operation", page 400-23.
(a) = Intersecting Lane Vehicles/hour (ILV/hr)
(b) = The amount of congestion depends on how much the ILV/hr value exceeds 1500. Observed flow rates will normally not exceed 1500 ILV/hr, and the excess will be delayed in a queue.

Roadway Segments

In order to determine the impacts on the study area roadway segments, **Table 2-4** has been developed by the City of San Diego and is used as a reference. The segment traffic volumes under LOS E as shown in this table are considered at capacity because at LOS E the v/c Ratio is equal to 1.0.

TABLE 2-4
CITY OF SAN DIEGO ROADWAY SEGMENT CAPACITY AND LEVEL OF SERVICE

Road Class	Lanes	Level of Service (LOS) A	B	C	D	E
Freeway	8	60,000	84,000	120,000	140,000	150,000
Freeway	6	45,000	63,000	90,000	110,000	120,000
Freeway	4	30,000	42,000	60,000	70,000	80,000
Expressway	6	30,000	42,000	60,000	70,000	80,000
Prime Arterial	6	25,000	35,000	50,000	55,000	60,000
Major Arterial	6	20,000	28,000	40,000	45,000	50,000
Major Arterial	4	15,000	21,000	30,000	35,000	40,000
Collector	4	10,000	14,000	20,000	25,000	30,000
Collector (No center lane) (Continuous left-turn lane)	4 2	5,000	7,000	10,000	13,000	15,000
Collector (No fronting property)	2	4,000	5,500	7,500	9,000	10,000
Collector (Commercial/Industrial fronting)	2	2,500	3,500	5,000	6,500	8,000
Collector (Multi-family)	2	2,500	3,500	5,000	6,500	8,000
Sub-Collector (Single family)	2	---	---	2,200	---	---

Notes:
The volumes and the average daily level of service listed above are only intended as a general planning guideline.
Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

Source: City of San Diego Traffic Impact Study Manual, Table 2, Page 8, July 1998.

Freeway Segments

In order to determine the impacts on the study area freeway segments, **Table 2-5** has been developed by Caltrans District 11 and is used as a reference. The procedure involves comparing the peak-hour volume of the mainline freeway segment to the theoretical capacity of the segment, which results in a v/c ratio. The calculated v/c ratio is then compared to the accepted ranges of v/c ratio values corresponding to the respective LOS.

TABLE 2-5
LOS CRITERIA FOR FREEWAY SEGMENT ANALYSIS

LOS	v/c Ratio	Congestion/Delay	Traffic Description
A	< 0.41	None	Free flow
B	0.41 – 0.62	None	Free to stable flow, light to moderate volumes
C	0.63 – 0.80	None to minimal	Stable flow, moderate volumes, freedom to maneuver noticeably restricted
D	0.81 – 0.92	Minimal to substantial	Approaches unstable flow, heavy volumes, and very limited freedom to maneuver
E	0.93 – 1.00	Significant	Extremely unstable flow, maneuverability and psychological comfort extremely poor
F_0	1.01 – 1.25	Considerable 0 – 1 hour delay	Forced flow, heavy congestion, long queues form behind breakdown points, stop and go
F_1	1.26 – 1.35	Severe 1 -2 hour delay	Very heavy congestion, very long queues
F_2	1.36 – 1.45	Very severe 2-3 hour delay	Extremely heavy congestion, very long queues
F_3	> 1.46	Extremely severe 3+ hours of delay	Gridlock

Notes:
Based on the 1992 Caltrans guidelines.

Freeway Ramp Metering

Ramp metering is a means of controlling the volume of traffic entering the freeway with the goal of improving the traffic operations and flow on the freeway main lanes. Freeway ramp meter analysis estimates the peak hour queues and delays at freeway ramps by comparing existing volumes to the meter rate at the given location. The excess demand, if any, forms the basis for calculating the maximum queues and maximum delays anticipated at each location. Substantial queues and delays can form where demand significantly exceeds the meter rate. This approach assumes a static meter rate throughout the course of the peak hour. However, Caltrans has indicated that the meter rates are continually adjusted based on the level of traffic using the on-ramp. To the extent possible, the meter rate is set such that the queue length
does not exceed the available storage, smooth flows on the freeway mainline is maintained, and there is no interference to arterial traffic.

According to local guidelines, a ramp metering analysis should be conducted at locations where 20 or more directional peak-hour trips would be expected.

Significance Determination

The City of San Diego and Caltrans have developed acceptable threshold standards to determine the significance of project impacts to intersections, roadway segments, freeway segments, and freeway ramp metering. At intersections, the measurement of effectiveness (MOE) is based on allowable increases in delay. Along roadway segments and freeway segments, the MOE is based on allowable increases in the volume-to-capacity (v/c) ratio. At a freeway ramp meter, the MOE is based on allowable increases in delay, measured in minutes.

LOS F is not acceptable for any approach leg except for side streets on an interconnected arterial system. If vehicle trips from a project cause an intersection approach leg to operate at LOS F, except in the cases of side streets on an interconnected arterial system, this would be considered a significant project traffic impact that requires mitigation. At intersections that are expected to operate at LOS E or F without the project, the allowable increase in delay is two seconds at LOS E and one second at LOS F with the addition of the project. If vehicle trips from a project cause the delay at an intersection to increase by more than the allowable threshold, this would be considered a significant project impact that requires mitigation. Also, if the project causes an intersection that was operating at an acceptable LOS to operate at LOS E or F, this would be considered a significant project impact that requires mitigation.

For roadway segments that are forecasted to operate at LOS E or F with the project, the allowable increase in v/c ratio is 0.02 at LOS E and 0.01 at LOS F. If vehicle trips from a project cause the v/c ratio to increase by more than the allowable threshold, this would be considered a significant project traffic impact that requires mitigation. Also, if the project causes a street segment that was operating at an acceptable LOS to operate at LOS E or F, this would be considered a significant impact that requires mitigation.

For freeway segments that are forecasted to operate at LOS E or F with the project, the allowable increase in v/c ratio is 0.01 at LOS E and 0.005 at LOS F. If vehicle trips from a project cause the v/c ratio to increase by more than the allowable threshold, this would be considered a significant project traffic impact that requires mitigation. Also, if the project causes a freeway segment that was operating at an acceptable LOS to operate at LOS E or F, this would be considered a significant impact that requires mitigation.

If vehicle trips from a project cause a metered ramp with a delay of 15 minutes per vehicle or higher to increase its delay by more than 2 minutes per vehicle, this would be considered a significant project traffic impact that requires mitigation if the freeway segment operates at LOS E or F.

Two classes of impacts are measured for significance: Direct Impacts and Cumulative Impacts. Direct traffic impacts are those projected to occur at the time the proposed study development becomes operational. During this time, other developments not presently operational but which are anticipated to be operational during the Near Term scenario are included. Cumulative traffic impacts are those projected to occur at some point after the proposed study development becomes operational, such as during subsequent phases of the project, and when additional proposed developments in the area become operational (short-term cumulative) or when the affected community plan area reaches full planned build out (long-term cumulative). The project applicant would be responsible for mitigating direct impacts by improving operation to better than pre-project conditions. The project applicant would provide their fair share contribution toward installing improvements to mitigate cumulative impacts. A fair share contribution is based on the project's proportionate traffic contribution to future increased traffic volumes on a facility.

In certain instances mitigation may not be required even if a roadway segment operates at LOS E or LOS F. In such cases the following three conditions must all be met:

1. The roadway is built to its ultimate classification per the community plan;
2. The intersections on both ends of the failing segment operate at an acceptable LOS; and
3. An HCM arterial analysis indicates an acceptable LOS on the segment.

Table 2-6 shows the criteria for determining levels of significance for the different facilities in the study area.

TABLE 2-6
SIGNIFICANCE CRITERIA FOR FACILITIES IN STUDY AREA

Facility	Measurement of Effectiveness (MOE)	Significance Threshold (a)
Intersection	Seconds of delay	>2.0 seconds at LOS E or >1.0 seconds at LOS F
Roadway Segment	ADT, v/c ratio	>0.02 at LOS E or >0.01 at LOS F
Freeway Segment	v/c ratio	>0.01 at LOS E or >0.005 at LOS F
Freeway ramp meter	Minutes of delay per vehicle	>2.0 minutes for freeway segments operating at LOS E, and > 1.0 minutes for freeway segments operating at LOS F. This criteria only applies for ramp meters where the delay without project is 15 minutes or higher.

Notes: If a project adds any increment of delay to cause the operations of an intersection to go from LOS D to either LOS E or LOS F, then the project is considered to cause a significant impact.
Source: City of San Diego Significance Determination Thresholds, page 72, January 2011.
(a) Significance threshold applies only when the type of facility operates at LOS E or F.

3.0 EXISTING CONDITIONS

This section summarizes the existing roadway circulation network, daily and peak-hour traffic volumes, and operations at the study intersections and roadway and freeway segments.

Road Network

The following provides a description of the existing street system within the vicinity of the project area.

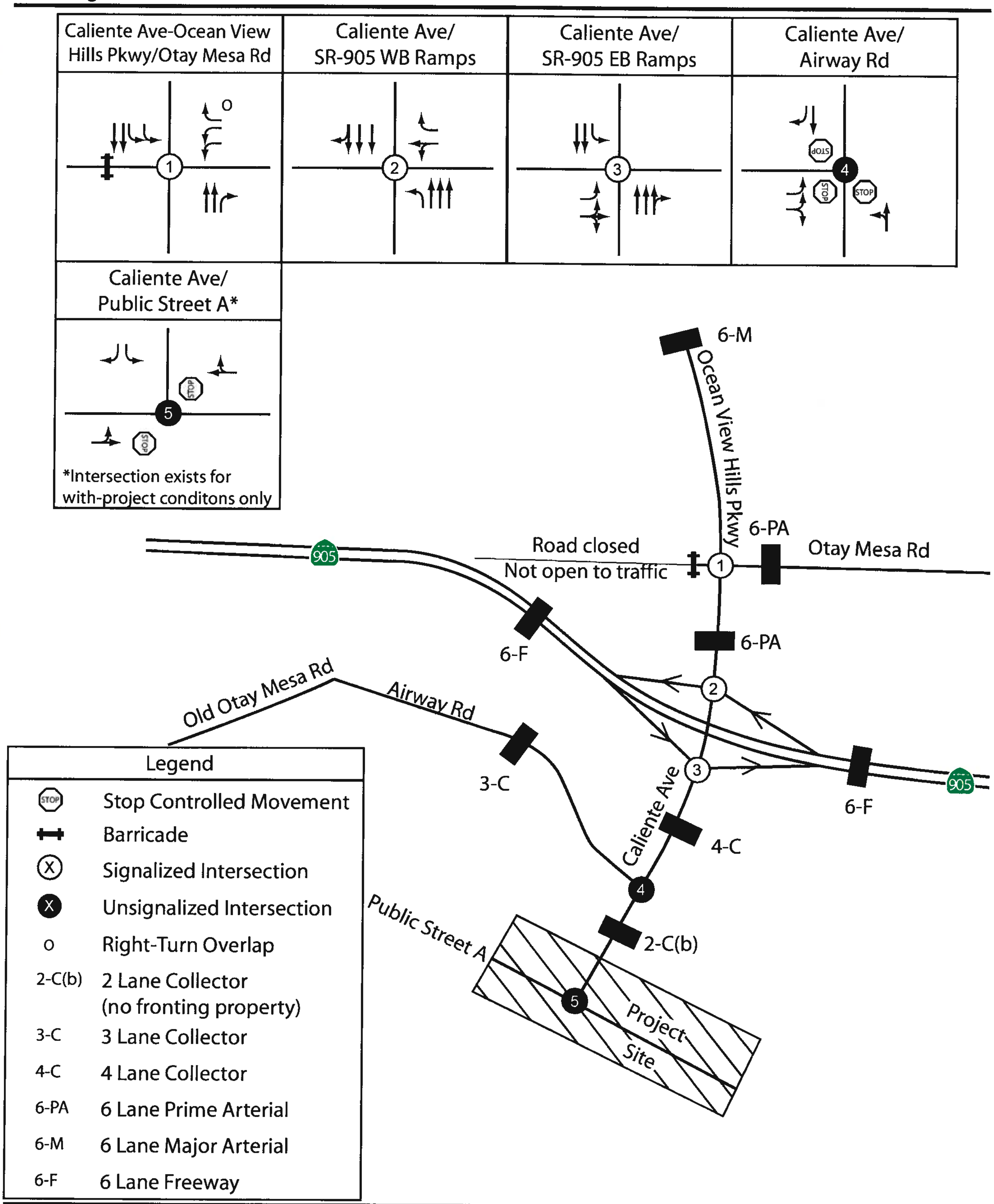
SR-905 is a six-lane freeway within the vicinity of the project site, with an interchange at Caliente Avenue. Bicycles are prohibited from cycling on the SR-905 freeway.

Otay Mesa Road currently functions as a six-lane prime arterial with a concrete k-rail median dividing the roadway. The posted speed limit along Otay Mesa Road is 50 mph. Otay Mesa Road is classified as a six-lane prime arterial with a Class II bicycle facility within the study area per the Otay Mesa Adopted Community Plan. Under the Alternative 3B without La Media Road scenario of the draft Otay Mesa Community Plan Update, Otay Mesa Road will not change its classification.

Caliente Avenue currently functions as an undivided four-lane collector with no fronting property between Otay Mesa Road and Airway Road. Caliente Avenue is classified as a six-lane major arterial with a Class II bicycle facility in the Otay Mesa Community Plan between Otay Mesa Road and Airway Road. South of Airway Road, Caliente Avenue is classified as a four-lane major arterial with a Class II bicycle facility. No sidewalks are provided along this road. Caliente Avenue becomes Ocean View Hills Parkway north of Otay Mesa Road. For the Near Term and Horizon Year conditions, Caliente Avenue is planned to be improved to a five-lane major arterial south of Airway Road by the Southview project immediately north of Candlelight. Under the Alternative 3B without La Media Road scenario of the draft Otay Mesa Community Plan Update, Caliente Avenue will be classified as a six-lane prime arterial between Otay Mesa Road and Airway Road and as a six-lane major between Airway Road and the future Beyer Boulevard extension.

Airway Road within the study area currently functions as a three-lane collector with a left-turn center lane that extends from Caliente Avenue west to Old Otay Mesa Road. The posted speed limit is 25 mph. San Ysidro High School is located along the south side of the roadway. Sidewalks are provided along the south side of the roadway and a portion of the north side. Parking is provided along both sides of the road. Airway Road is classified as a four-lane major arterial with a Class II bicycle facility per the Otay Mesa Adopted Community Plan. Under the Alternative 3B without La Media Road scenario of the draft Otay Mesa Community Plan Update, Airway Road will not change its classification.

Figure 3-1 shows the geometrics of the study intersections, roadway segments and freeway segments for the Existing scenario.



Existing Conditions Intersection and Roadway Geometrics

Traffic Volumes

Existing a.m. (7:00 to 9:00 a.m.) and p.m. (4:00 to 6:00 p.m.) peak-hour turning movement counts were conducted by National Data Services at the two existing intersections within the study area in September 2012. The 24-hour roadway machine counts along the roadway segments within the study area were also collected by National Data Services in September 2012.

Daily traffic volumes along the SR-905 freeway are not ready for public distribution by Caltrans, as they are under review. For analysis purpose only, volumes along the SR-905 freeway segments were estimated by comparing ADT counts collected along Otay Mesa Road on February 2012 (prior to the completion of the SR-905 freeway) and September 2012 (post construction of SR-905). It was assumed that the reduction of traffic along Otay Mesa Road would be equal to the existing traffic volumes along the newly constructed SR-905 freeway.

Figure 3-2 illustrates the Existing conditions traffic volumes for the study area intersections, and roadway and freeway segments.

Appendix B contains the existing peak-hour traffic volume data at the study intersections and the existing ADT volume data for the roadway segments.

Intersection Analysis

Table 3-1 displays the LOS analysis results for the study intersections under Existing Conditions. As shown in the table, all study intersections operate at LOS C or better during both peak periods.

Appendix C contains the peak-hour intersections LOS calculation worksheets.

Intersecting Lane Vehicle Analysis

Table 3-2 displays the ILV analysis results for the Caltrans-owned signalized intersections under the Existing conditions. As shown in the table, both intersections operate below capacity.

Appendix D contains the ILV worksheets.

Roadway Segment Analysis

Table 3-3 displays the roadway segment analysis under Existing Conditions. As shown in the table, all study roadway segments operate at LOS B or better.

Freeway Segment Analysis

Table 3-4 displays the freeway segment analysis under Existing Conditions. The SR-905 freeway segment between the I-805 and Britannia Boulevard was recently constructed and opened to traffic in August 2012. As shown in the Table, all study freeway segments operate at LOS A under existing conditions.

Freeway Ramp Metering Analysis

Freeway ramp metering analysis was not performed for Existing Conditions. The two new on-ramps along Caliente Avenue are currently not being metered by Caltrans.

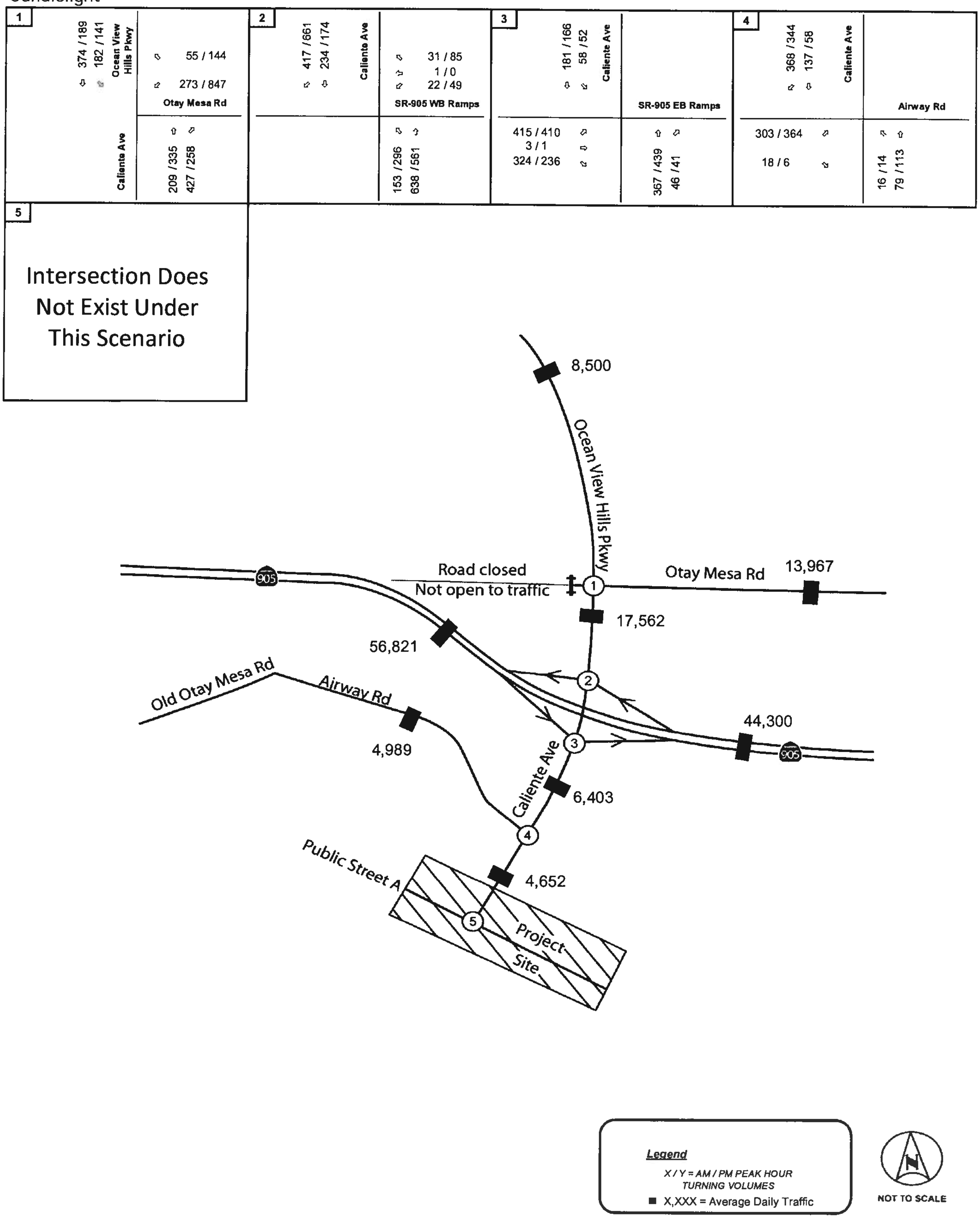


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FIGURE 3-2

Existing Conditions Traffic Volumes

TABLE 3-1
EXISTING CONDITIONS
PEAK-HOUR INTERSECTION LOS SUMMARY

	INTERSECTION	TRAFFIC CONTROL	PEAK HOUR	EXISTING BASELINE	
				DELAY (a)	LOS (b)
1	Otay Mesa Rd & Caliente Ave	Signal	AM	18.8	B
			PM	33.2	C
2	SR-905 WB Ramps & Caliente Ave	Signal	AM	7.8	A
			PM	13.4	B
3	SR-905 EB Ramps & Caliente Ave	Signal	AM	12.3	B
			PM	12.6	B
4	Airway Rd & Caliente Ave	All-Way Stop	AM	18.2	C
			PM	21.1	C

Notes:
(a) Delay refers to the average control delay for the entire intersection, measured in seconds per vehicle.
(b) LOS calculations are based on the methodology outlined in the *2000 Highway Capacity Manual* and performed using Synchro 7

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TABLE 3-2
EXISTING CONDITIONS
PEAK-HOUR ILV SUMMARY

INTERSECTION		PEAK HOUR	EXISTING BASELINE	
			ILV TOTAL	CAPACITY
2	Caliente Ave & SR-905 WB Ramps	AM	597	Below Capacity
		PM	1024	Below Capacity
3	Caliente Ave & SR-905 EB Ramps	AM	567	Below Capacity
		PM	536	Below Capacity

Notes:
Bold values indicate intersections operating above capacity.

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TABLE 3-3
EXISTING CONDITIONS
ROADWAY SEGMENT LOS SUMMARY

ROADWAY SEGMENT	FUNCTIONAL ROADWAY CLASSIFICATION	LOS E CAPACITY	ADT (a)	V/C RATIO (b)	LOS
Otay Mesa Road					
Caliente Ave to Heritage Rd	6 Lane Prime Arterial	60,000	13,967	0.233	A
Caliente Avenue					
Otay Mesa Rd to SR-905	6 Lane Prime Arterial	60,000	17,562	0.293	A
SR-905 to Airway Rd	4 Lane Collector	30,000	6,403	0.213	A
Airway Rd to Public Street A (c)	2 Lane Collector (no fronting property)	10,000	4,652	0.465	B
Airway Road					
Old Otay Mesa Rd to Caliente Ave	3 Lane Collector (d)	22,500	4,989	0.222	A
Ocean View Hills Parkway					
Otay Mesa Rd to Hidden Trails Rd	6 Lane Major Arterial	50,000	8,500	0.17	A

Notes:
Bold values indicate roadway segments operating at LOS E or F.
(a) Average Daily Traffic (ADT) volumes for the roadway segments were provided by National Data & Surveying Services and measured in September 2012.
(b) The v/c Ratio is calculated by dividing the ADT volume by each respective roadway segment's capacity.
(c) There is an existing driveway (High School) that does not affect the capacity or classification of the segment.
(d) The capacity for the 3-lane collector was calculated by taking 3/4 of the capacity of a 4-lane collector.

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TABLE 3-4

EXISTING CONDITIONS

FREEWAY SEGMENT LOS SUMMARY

FREEWAY SEGMENT	DIRECTION	NUMBER OF LANES	CAPACITY (a)	ADT (b)	K (PEAK HOUR %)	D (DIRECTIONAL SPLIT)	TRUCK FACTOR	PEAK-HOUR VOLUME (c)	V/C RATIO	LOS
AM PEAK										
SR-905										
I-805 to Caliente Ave	WB	3 M	7,050	56,821	0.062	0.433	0.950	1,606	0.23	A
	EB	3 M	8,450		0.062	0.567	0.950	2,103	0.25	A
Caliente Ave to Britannia Blvd	WB	3 M	7,050	44,300	0.062	0.433	0.950	1,252	0.18	A
	EB	3 M	7,050		0.062	0.567	0.950	1,639	0.23	A
PM PEAK										
SR-905										
I-805 to Caliente Ave	WB	3 M	7,050	56,821	0.070	0.535	0.950	2,240	0.32	A
	EB	3 M	8,450		0.070	0.465	0.950	1,947	0.23	A
Caliente Ave to Britannia Blvd	WB	3 M	7,050	44,300	0.070	0.535	0.950	1,746	0.25	A
	EB	3 M	7,050		0.070	0.465	0.950	1,518	0.22	A

Notes:

Bold values indicate freeway segments operating at LOS E or F.

M=Main Lane; A= Auxiliary Lane

(a) The capacity is calculated as 2,350 vehicles per hour per lane (vhpl) for the main lanes, at 1,800 vhpl per auxiliary lanes, and at 1,600 vhpl per truck lanes and HOV lanes

(b) Traffic volumes were estimated by comparing ADT counts collected along Otay Mesa Road on February 2012 (prior to the completion of the SR-905 freeway) and September 2012 (post construction of SR-905). It was assumed that the reduction of traffic along Otay Mesa Road would be equal to the existing traffic volumes along the newly constructed SR-905 freeway

(c) Peak-hour volume calculated by: (ADT*K*D)/Truck Factor. K and D factors were extracted from a traffic count collected along Otay Mesa Road in February 2012

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4.0 PROJECT TRAFFIC

The following section describes the trip generation, distribution and assignment related to the proposed Candlelight project.

Trip Generation

In order to estimate the traffic generation for the site, standard City of San Diego traffic generation rates taken from the City of San Diego *Trip Generation Manual* (May 2003) were applied to the proposed project. "Multiple Dwelling Units – Over 20 dwelling units per acre" rates were used to estimate the daily trip rate and morning and afternoon peak-hour traffic generation for this use. **Table 4-1** summarizes the trip generation for the site. As shown in the table, the site would generate a total of 2,850 new daily trips, including 228 (46 in, 182 out) a.m. peak-hour trips, and 257 (180 in, 77 out) p.m. peak-hour trips.

Trip Distribution

The project distribution for the Existing and Near Term roadway network scenarios were estimated based on traffic distributions patterns used in the final Traffic Impact Study prepared for the Southview project, dated November 15, 2011. The distributions for both studies should be the same since both projects have the same land uses and the roadway segment networks are the same.

For the Horizon Year scenarios, a Series 11 Select Zone model run was obtained for the project and provided by the City of San Diego. The distribution for the Horizon Year scenario is different from the Near Term scenario because of land use and roadway network changes expected for the Horizon Year conditions based on the City's Adopted Community Plan and Public Facilities Financing Plan for the Otay Mesa community.

Existing and Near Term Conditions:

- 87% of the project traffic would originate from the north along Caliente Avenue.
    - 32% would originate from the north
        - 6% north along Ocean View Hills Parkway
        - 26% east along Otay Mesa Road
    - 42% would originate from the west along SR-905
    - 13% would originate from the east along SR-905
- 13% of the project traffic would originate from the west along Airway Road.

Horizon Year Conditions:

- 2% of the project traffic would originate from the south along Caliente Avenue.
- 88% of the project traffic would originate from the north along Caliente Avenue.
    - 41% would originate from the north
        - 8% north along Ocean View Hills Parkway
        - 28% east along Otay Mesa Road
        - 5% west along Otay Mesa Road)
    - 14% would originate from the west along SR-905
    - 33% would originate from the east along SR-905
- 10% of the project traffic would originate from the west along Airway Road.

Figure 4-1 shows the project traffic distribution for the Existing and Near Term conditions. **Figure 4-2** shows the project traffic distributions for the Horizon Year Conditions.

TABLE 4-1
TRIP GENERATION SUMMARY

	Land Use	Units[1]	Daily Trip Rate[2]	Daily Trips	AM Peak-Hour % of ADT[2]	AM In:Out Ratio[2]	AM In	AM Out	AM Total	PM Peak-Hour % of ADT[2]	PM In:Out Ratio[2]	PM In	PM Out	PM Total
Driveway Trips[3]														
Proposed														
Candlelight	Multiple Dwelling Unit - Over 20 dwelling units/acre	475 du	6 / du	2,850	8%	2.00 : 8.00	46	182	228	9%	7.00 : 3.00	180	77	257
Proposed Total				**2,850**			**46**	**182**	**228**			**180**	**77**	**257**
NET TRIP GENERATION =				**2,850**			**46**	**182**	**228**			**180**	**77**	**257**

Note:
1. DU = Dwelling Unit
2. Trip rates referenced from the City of San Diego Land Development Code - Trip Generation Manual, May 2003.
3. Driveway trips are the total number of trips generated by a site.

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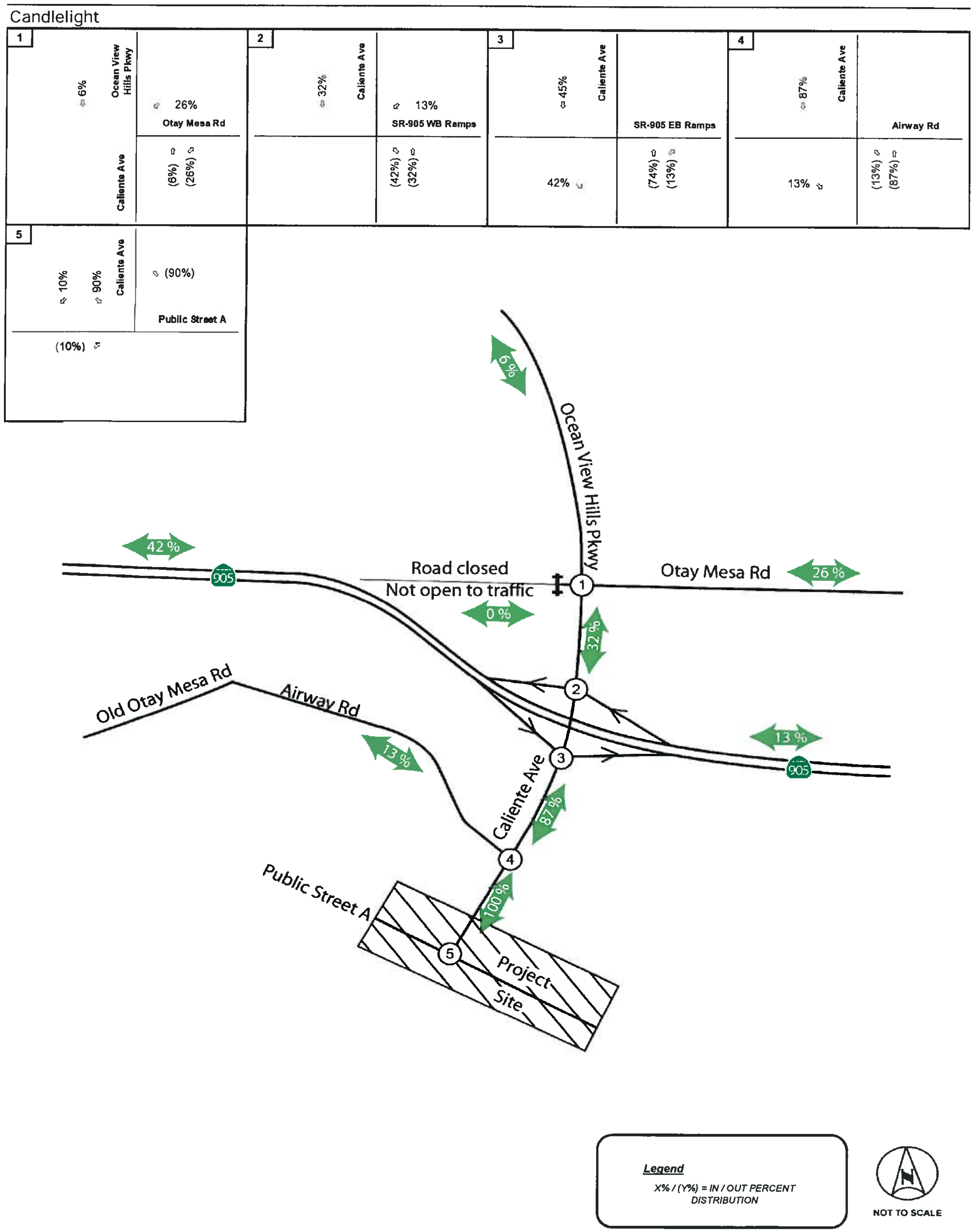
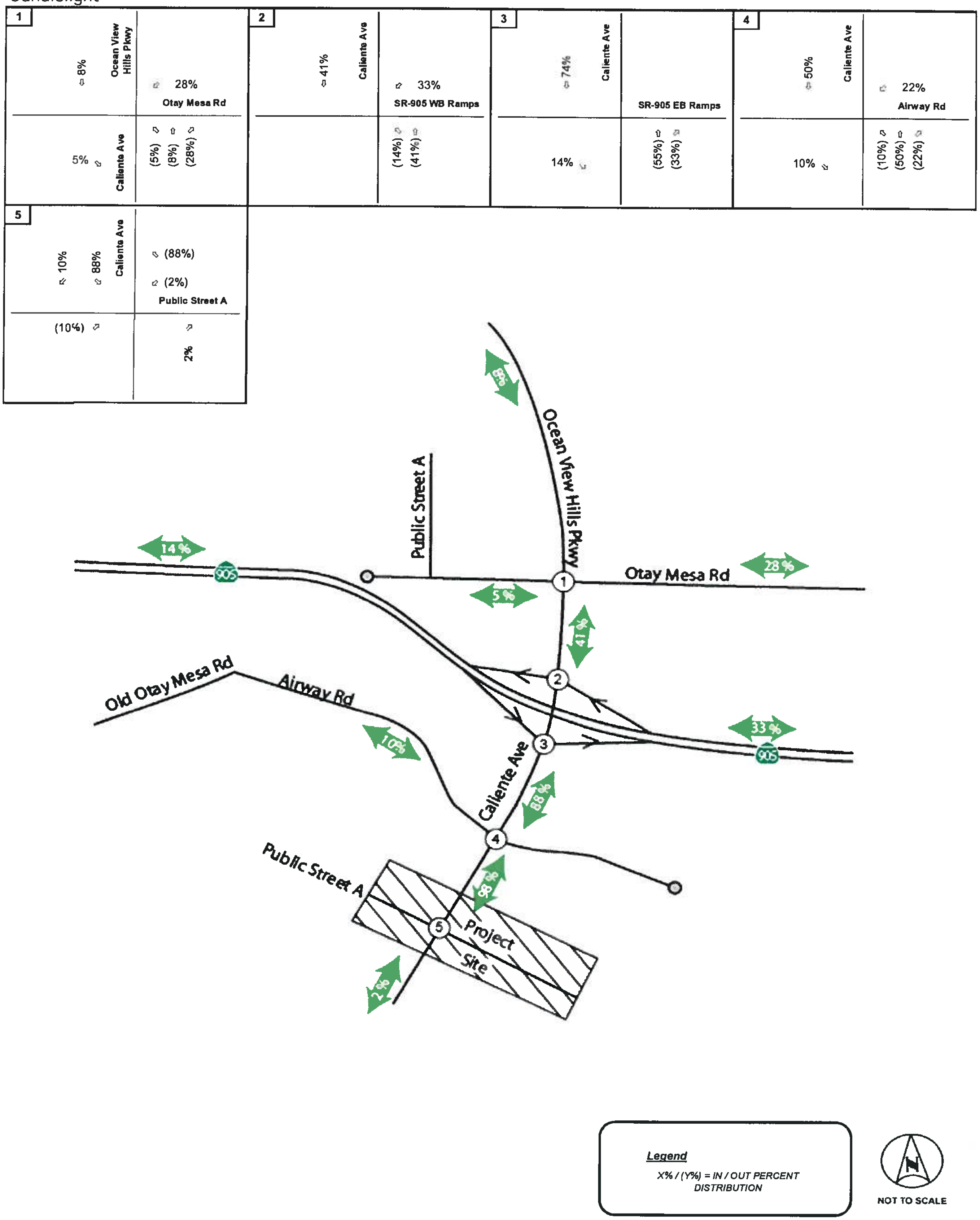


FIGURE 4-1
Existing and Near Term Conditions Project Trip Distribution

Candlelight



Trip Assignment

Based on the project trip distributions, daily and a.m. and p.m. peak-hour project trips were assigned to the local roadway network and through the study intersections. **Figure 4-3** shows the project traffic assignment for the Existing and Near Term conditions and **Figure 4-4** shows the project traffic assignment for Horizon Year conditions.

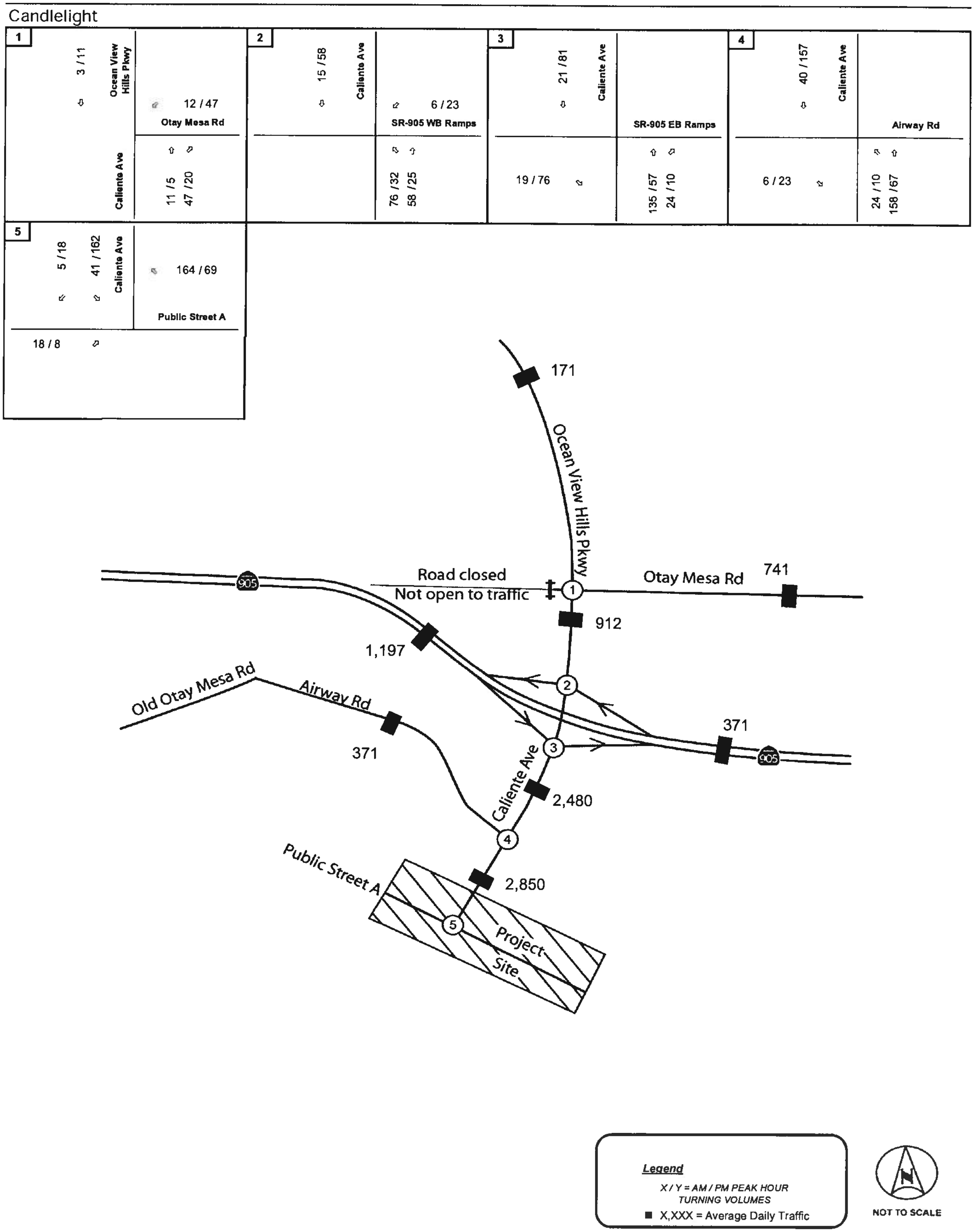


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FIGURE 4-3
Existing and Near Term Conditions Project Trip Assignment

Candlelight

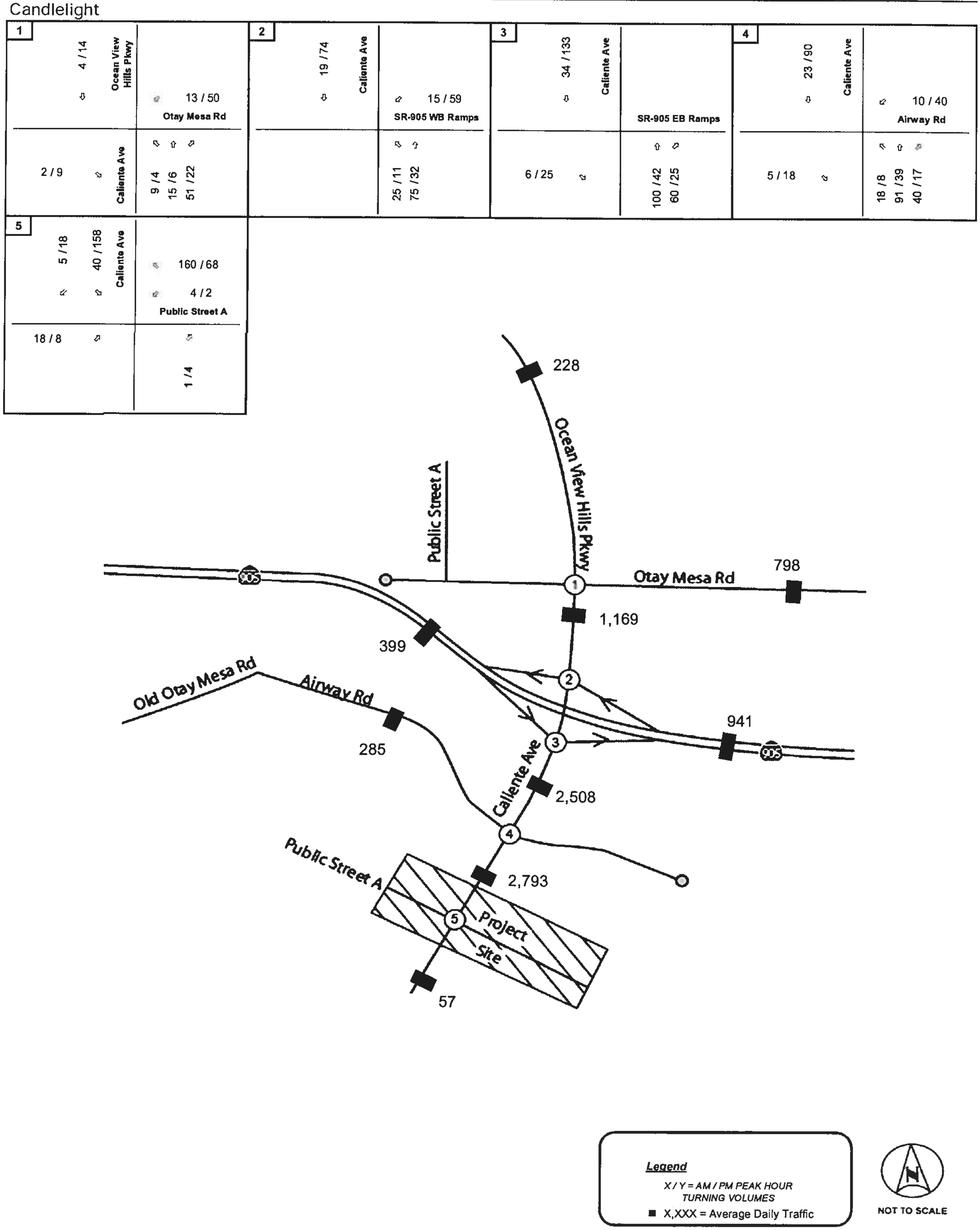

FIGURE 4-4

Horizon Year Condition Project Trip Assignment

5.0 EXISTING WITH PROJECT CONDITIONS

This section provides a description of existing conditions with the addition of the proposed project traffic.

Road Network

Public Street A will be constructed at the southern end of Caliente Avenue as part of the project and will provide access to the site. No additional study area roadway network changes are assumed to take place with the construction of the proposed project. The intersection of Public Street A and Caliente Avenue will be an all-way stop controlled intersection. A signal warrant analysis was conducted at this intersection and signal warrants were not met with the addition of the proposed project traffic. A copy of the signal warrant is included in **Appendix G**.

Traffic Volumes

Traffic volumes for the existing plus project conditions were estimated by adding the project traffic to the existing traffic volumes. **Figure 5-1** illustrates the Existing with Project Conditions traffic volumes at the study intersections, and roadway and freeway segments.

Intersection Analysis

Table 5-1 displays the LOS analysis results for the study intersections under the existing with and without project conditions. As shown in the table, all study intersections would continue to operate at LOS D or better during both peak periods with and without the proposed project.

Appendix C contains the peak-hour intersections LOS calculation worksheets.

Intersecting Lane Vehicle Analysis

Table 5-2 displays the ILV analysis results for the Caltrans-owned signalized intersections at the SR-905 interchange with Caliente Avenue under the Existing with Project conditions. As shown in the table, both intersections continue to operate below capacity with the addition of the project related traffic.

Appendix D contains the ILV worksheets.

Roadway Segment Analysis

Table 5-3 displays the roadway segments analysis under Existing with Project Conditions. As shown in the table, all roadway segments would operate at LOS D or better with the addition of the project related traffic.

Freeway Segment Analysis

Table 5-4 displays the freeway segments analysis under the Existing with Project Conditions. As shown in the table, both directions of both freeway segments in the study area would function at LOS A with the addition of the proposed project.

Freeway Ramp Metering Analysis

Freeway ramp metering analysis was not performed for Existing with Project Conditions. The two new on-ramps along Caliente Avenue are currently not being metered by Caltrans.

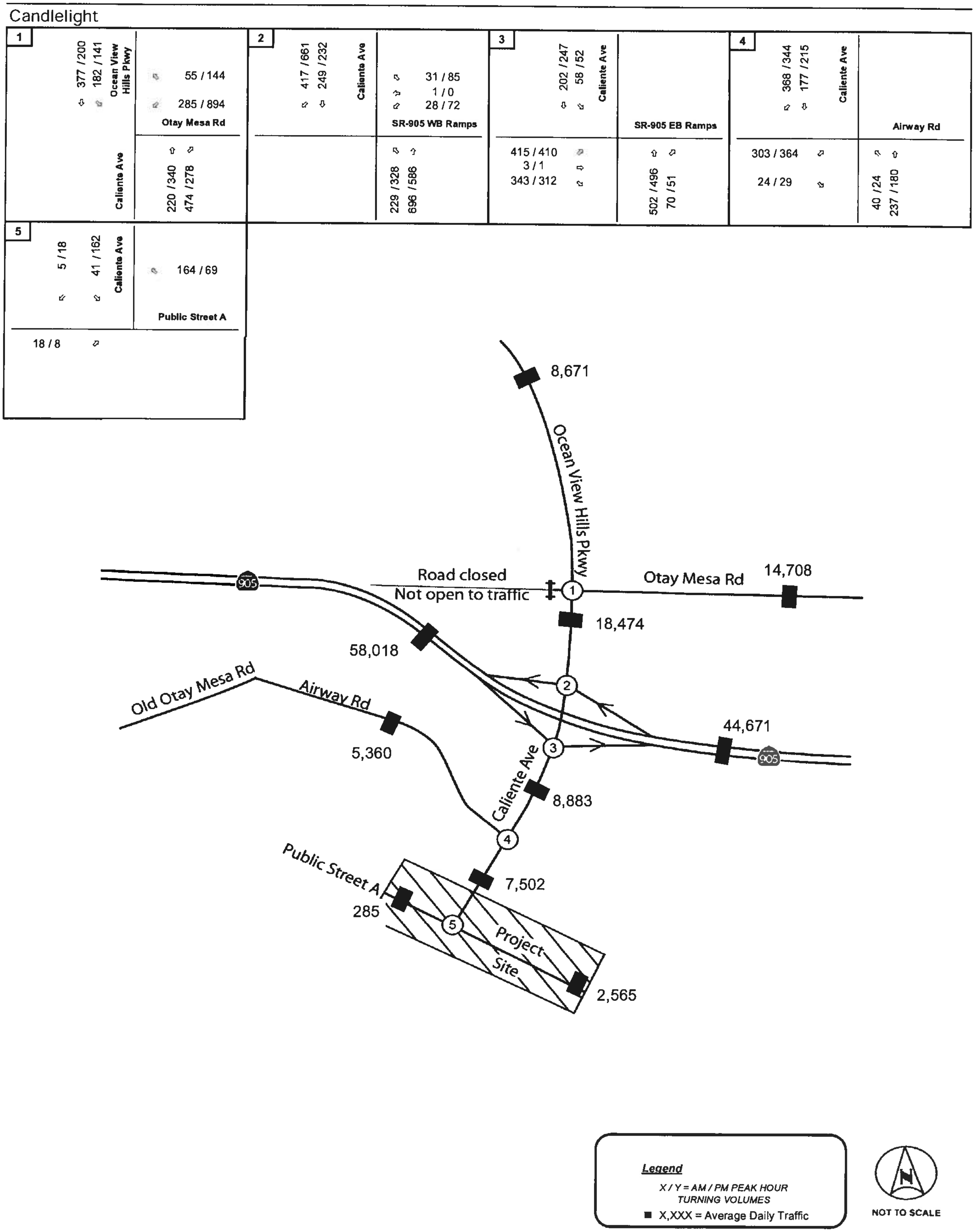

FIGURE 5-1

Existing with Project Conditions Traffic Volumes

TABLE 5-1
EXISTING WITH PROJECT CONDITIONS
PEAK-HOUR INTERSECTION LOS SUMMARY

INTERSECTION		PEAK HOUR	EXISTING BASELINE		EXISTING PLUS PROJECT			
			DELAY (a)	**LOS (b)**	**DELAY (a)**	**LOS (b)**	**Δ (c)**	**SIGNIFICANT?**
1	Otay Mesa Rd & Caliente Ave	AM	18.8	B	19.0	B	0.2	NO
		PM	33.2	C	35.0	D	1.8	NO
2	SR-905 WB Ramps & Caliente Ave	AM	7.8	A	9.4	A	1.6	NO
		PM	13.4	B	15.7	B	2.3	NO
3	SR-905 EB Ramps & Caliente Ave	AM	12.3	B	13.5	B	1.2	NO
		PM	12.6	B	13.5	B	0.9	NO
4	Airway Rd & Caliente Ave	AM	18.2	C	34.1	D	15.9	NO
		PM	21.1	C	29.5	D	8.4	NO
5	Public Street A & Caliente Ave	AM	Intersection does not exist under this scenario		11.7	B	11.7	NO
		PM			13.0	B	13.0	NO

Notes:
Bold values indicate intersections operating at LOS E or F. **Bold and shaded** values indicate project significant impact.
(a) Delay refers to the average control delay for the entire intersection, measured in seconds per vehicle.
(b) LOS calculations are based on the methodology outlined in the *2000 Highway Capacity Manual* and performed using Synchro 7
(c) Change in delay due to addition of project traffic

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TABLE 5-2

EXISTING WITH PROJECT CONDITIONS

PEAK-HOUR ILV SUMMARY

	INTERSECTION	PEAK HOUR	EXISTING BASELINE		EXISTING PLUS PROJECT		Δ
			ILV TOTAL	CAPACITY	ILV TOTAL	CAPACITY	
2	Caliente Ave & SR-905 WB Ramps	AM	597	Below Capacity	676	Below Capacity	79
		PM	1024	Below Capacity	1066	Below Capacity	42
3	Caliente Ave & SR-905 EB Ramps	AM	567	Below Capacity	630	Below Capacity	63
		PM	536	Below Capacity	597	Below Capacity	61

Notes:
Bold values indicate intersections operating above capacity.

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TABLE 5-3
EXISTING WITH PROJECT
ROADWAY SEGMENT LOS SUMMARY

ROADWAY SEGMENT	ROADWAY CLASSIFICATION	LOS E CAPACITY	EXISTING BASELINE			EXISTING PLUS PROJECT			Δ in ADT	Δ in V/C	SIGNIFICANT?
			ADT	V/C RATIO (a)	LOS	ADT	V/C RATIO (a)	LOS			
Otay Mesa Road											
Caliente Ave to Heritage Rd	6 Lane Prime Arterial	60,000	13,967	0.233	A	14,708	0.245	A	741	0.012	NO
Caliente Avenue											
Otay Mesa Rd to SR-905	6 Lane Prime Arterial	60,000	17,562	0.293	A	18,474	0.308	A	912	0.015	NO
SR-905 to Airway Rd	4 Lane Collector	30,000	6,403	0.213	A	8,883	0.296	A	2480	0.083	NO
Airway Rd to Public Street A	2 Lane Collector (no fronting property)	10,000	4,652	0.465	B	7,502	0.75	D	2850	0.285	NO
Airway Road											
Old Otay Mesa Rd to Caliente Ave	3 Lane Collector	22,500	4,989	0.222	A	5,360	0.238	A	371	0.016	NO
Ocean View Hills Parkway											
Otay Mesa Rd to Hidden Trails Rd	6 Lane Major Arterial	50,000	8,500	0.17	A	8,671	0.173	A	171	0.003	NO

Notes:
Bold values indicate roadway segments operating at LOS E or F. **Bold and shaded** values indicate a project significant impact
(a) The v/c Ratio is calculated by dividing the ADT volume by each respective roadway segment's capacity

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TABLE 5-4
EXISTING WITH PROJECT
FREEWAY SEGMENT LOS SUMMARY

FREEWAY SEGMENT	DIRECTION	NUMBER OF LANES	CAPACITY (a)	EXISTING BASELINE						PROJECT PEAK-HOUR VOLUME		EXISTING WITH PROJECT						V/C RATIO Δ		SIGNIFICANT?
				AM PEAK			PM PEAK					AM PEAK			PM PEAK					
				PEAK-HOUR VOLUME (b)	V/C RATIO	LOS	PEAK-HOUR VOLUME (b)	V/C RATIO	LOS	AM	PM	PEAK-HOUR VOLUME	V/C RATIO	LOS	PEAK-HOUR VOLUME	V/C RATIO	LOS	AM	PM	
SR-905																				
I-805 to Caliente Ave	WB	3 M	7,050	1,606	0.228	A	2,240	0.318	A	76	32	1,682	0.239	A	2,272	0.322	A	0.011	0.005	--
	EB	3 M	7,050	2,103	0.298	A	1,947	0.276	A	19	76	2,122	0.301	A	2,022	0.287	A	0.003	0.011	--
Caliente Ave to Britannia Blvd	WB	3 M	7,050	1,252	0.178	A	1,746	0.248	A	6	23	1,258	0.178	A	1,770	0.251	A	0.001	0.003	--
	EB	3 M	7,050	1,639	0.233	A	1,518	0.215	A	24	10	1,663	0.236	A	1,528	0.217	A	0.003	0.001	--

Notes.
Bold values indicate freeway segments operating at LOS E or F.
M= Main lane, A= Auxiliary lane; T=Truck lane
(a) The capacity is calculated as 2,350 vehicles per hour per lane (vhpl) for the main lanes, at 1,800 vhpl per auxiliary lanes, and at 1,600 vhpl per truck lanes and HOV lanes
(b) Peak-hour volumes taken from the San Diego - Tijuana Cross Border Facility Project Traffic Impact Study and adjusted to remove the existing land use at the project site.

6.0 NEAR TERM CONDITIONS

This section provides a description of the Near Term (2014) conditions with the addition of the proposed project.

Road Network

No study area roadway network changes are assumed to take place with the construction of the proposed project. It is assumed that with the construction of the Southview project, Caliente Avenue will be widened between Airway Road and the northern project boundary (which is the southern Southview project boundary) to a five-lane major facility with three northbound lanes and two southbound lanes. The segment between Airway Road and Otay Mesa Road would be completed as a six-lane Prime Arterial with the completion of the curb work north of Airway Road. Also, as part of the Southview project, the eastern fourth leg of the Airway Road and Caliente Avenue intersection will be constructed. A tentative map for the Southview project was approved by City Council on September 2012. **Figures 6-1** shows the intersection geometrics assumed to be in place by the Near Term (Year 2014) scenario.

Cumulative Projects

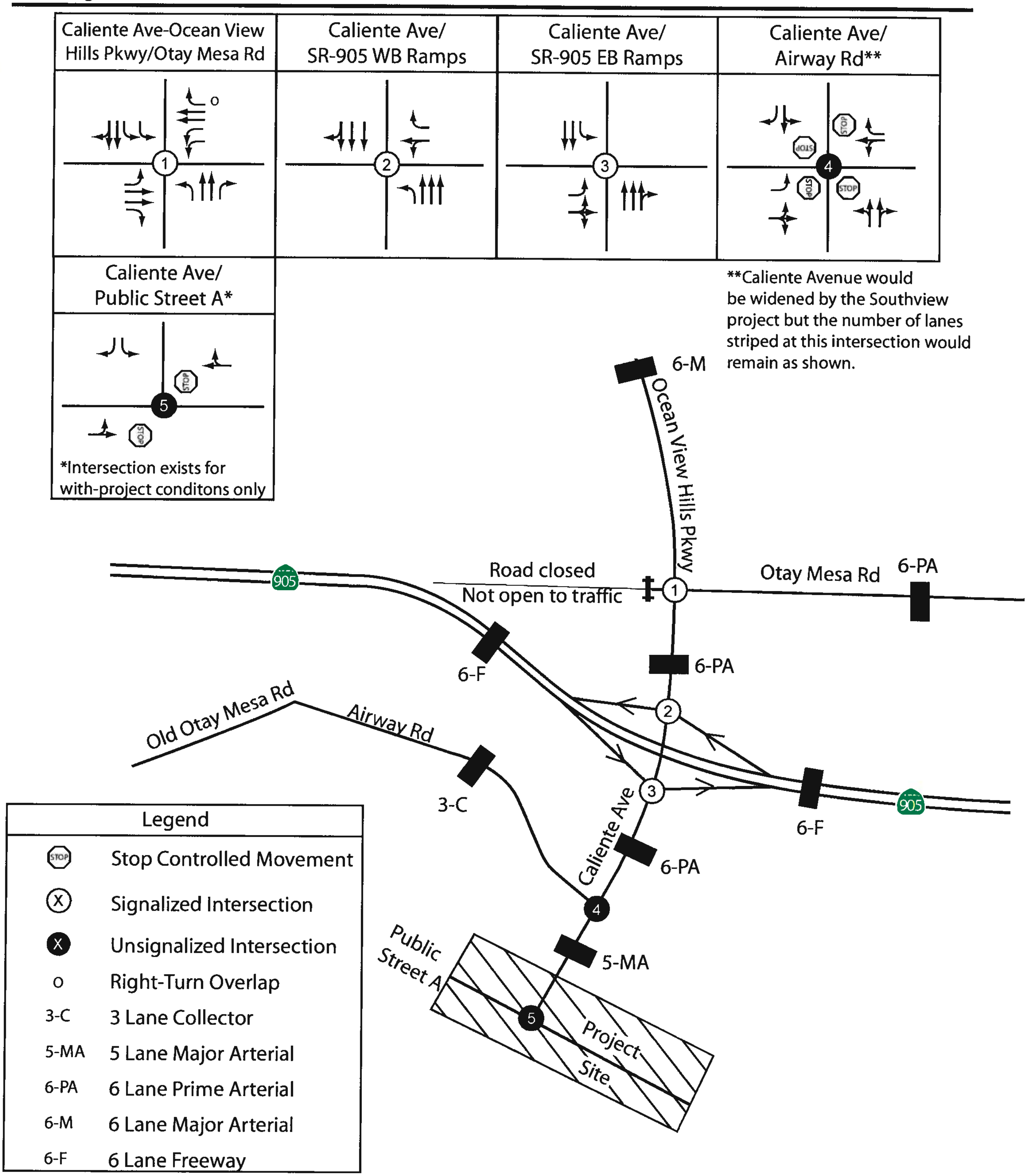
Twenty-two (22) projects were identified as potential cumulative projects. Of those twenty-two projects, eleven (11) projects were included in the cumulative project list due to their current status and proximity to the study area. The eleven cumulative projects included in this study can reasonably be assumed to be completed prior to the opening day (Year 2014) scenario. Information on the cumulative projects was extracted from the approved Traffic Study for the *San Diego-Tijuana Cross Border Facility*, dated June 28, 2011, and the approved Traffic Study for the Southview project, dated November 15, 2011. **Table 6-1** lists each cumulative project included in the study with the assumed traffic generation for each project. **Figure 6-2** illustrates the location of each cumulative project. **Figure 6-3** displays the assumed traffic volumes associated with the combined eleven identified cumulative projects within the study area.

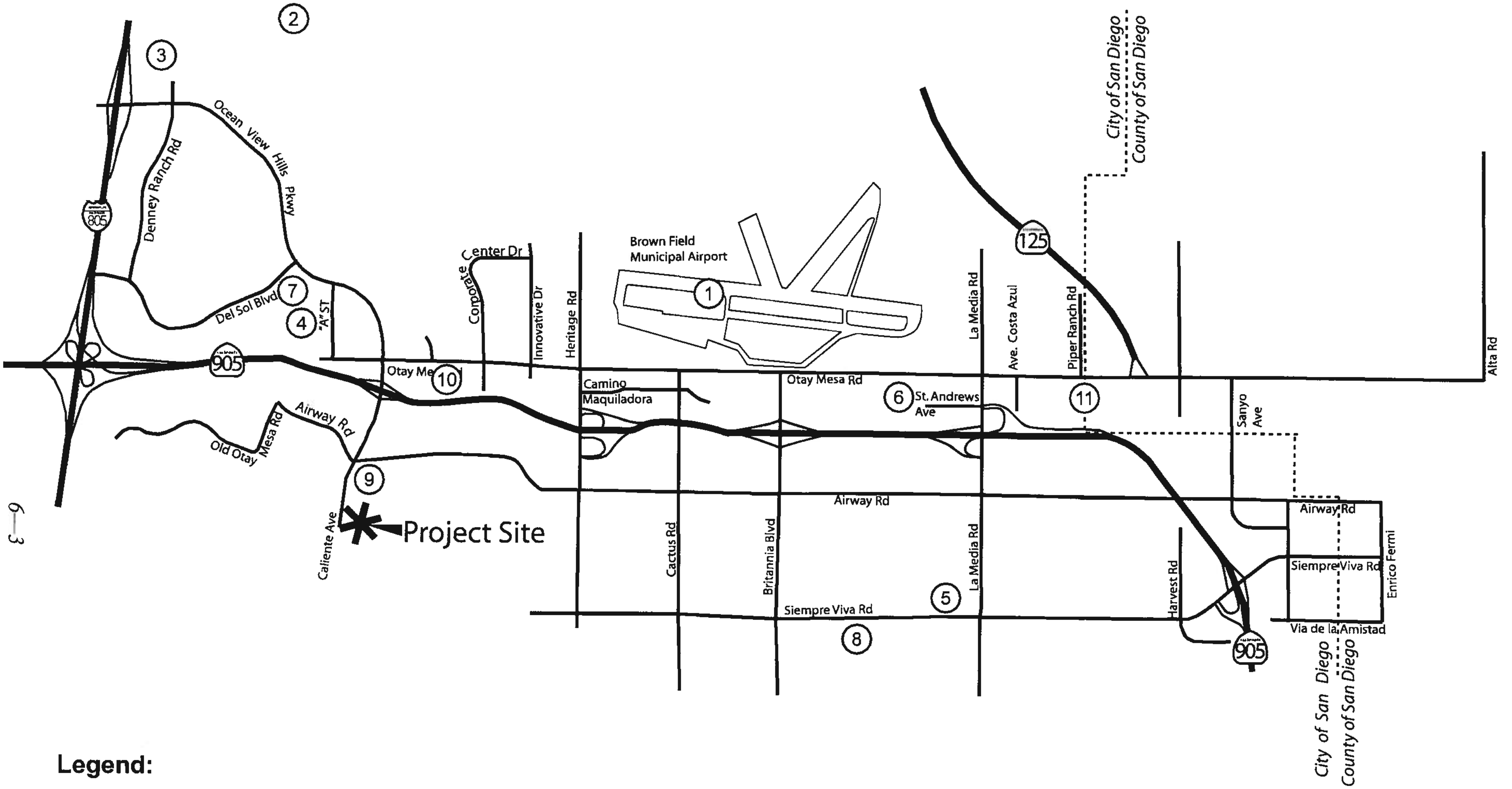
Traffic Volumes

Near Term 2014 Baseline peak-hour volumes at the study intersections and the Average Daily Traffic (ADT) volumes on the study roadway and freeway segments were determined by adding the reasonably expected cumulative project volumes to the Existing 2012 volumes. **Appendix H** contains a copy of the cumulative projects traffic volumes information.

Figure 6-4 illustrates the Near Term Baseline conditions traffic volumes at the study intersections, and roadway and freeway segments.

To determine the traffic volumes under the Near Term with Project scenario, the trips associated with the project were added to the Near Term Baseline volumes at the study intersections and roadway segments. **Figure 6-5** illustrates the Near Term with Project traffic volumes at the study intersections, and roadway and freeway segments.


Caliente Ave-Ocean View Hills Pkwy/Otay Mesa Rd
Caliente Ave/ SR-905 WB Ramps
Caliente Ave/ SR-905 EB Ramps
Caliente Ave/ Airway Rd**
Caliente Ave/ Public Street A*
*Intersection exists for with-project conditons only
**Caliente Avenue would be widened by the Southview project but the number of lanes striped at this intersection would remain as shown.
6-M
Ocean View Hills Pkwy
Road closed
Not open to traffic
Otay Mesa Rd
6-PA
6-F
905
Old Otay Mesa Rd
Airway Rd
3-C
Caliente Ave
5-MA
Public Street A
Project Site
Legend
Stop Controlled Movement
Signalized Intersection
Unsignalized Intersection
o Right-Turn Overlap
3-C 3 Lane Collector
5-MA 5 Lane Major Arterial
6-PA 6 Lane Prime Arterial
6-M 6 Lane Major Arterial
6-F 6 Lane Freeway



Legend:

City of San Diego

1. Metro Airpark
2. Las Casitas
3. Nakano
4. Playa Del Sol
5. Siempre Viva Industrial Park
6. South Bay Otay Mesa
7. Vista Del Mar Elementary
8. Otay Cross Border Facility
9. Southview
10. Handler
11. Sunroad Otay Plaza (Phase I)

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FIGURE 6-2

Location of Cumulative Projects

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TABLE 6-1
LIST OF CUMULATIVE PROJECTS

	PROJECT[a]	LAND USE	ADT	STATUS (c)
1	Metro Airpark (Phase I)	Airfield Expansion	4,574 ADT	In Review
2	Las Casitas	Residential	1,480 ADT	Pending
3	Nakano	Park Site / Church	1,020 ADT	Pending
4	Playa Del Sol	Residential	9,432 ADT	Under Construction
5	Siempre Viva Industrial Park	Industrial	1,250 ADT	Approved
6	South Bay Otay Mesa	Warehouse	1,678 ADT	Approved
7	Vista Del Mar Elementary	School	1,400 ADT	Open
8	Otay Cross Border Facility (Phase I)	Mixed-Use	13,683 ADT	Approved
9	Southview (b)	Residential	3,318 ADT	Approved
10	Handler	Mixed – Use	12,631 ADT	Approved
11	Sunroad Otay Plaza	Commercial	11,205 ADT	Pending
		TOTAL	**61,671 ADT**	

Source:
(a) Approved Traffic Study for the San Diego-Tijuana Cross Border Facility, dated June 28, 2011
(b) Approved Traffic Study for the Southview project, dated November 15, 2011.
(c) At the time existing intersections and roadway segment counts were conducted in September 2012

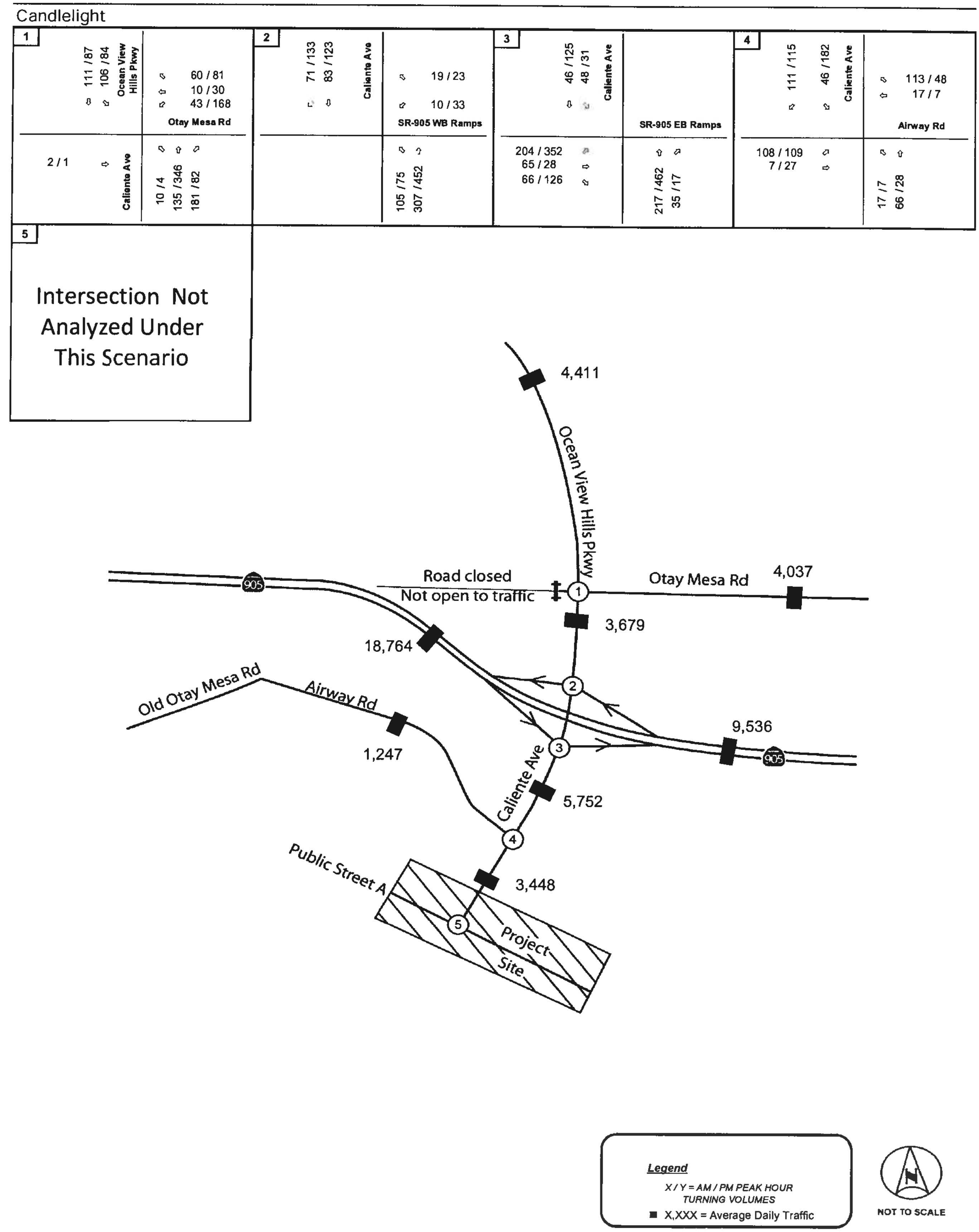

FIGURE 6-3

Cumulative Projects Traffic Volumes

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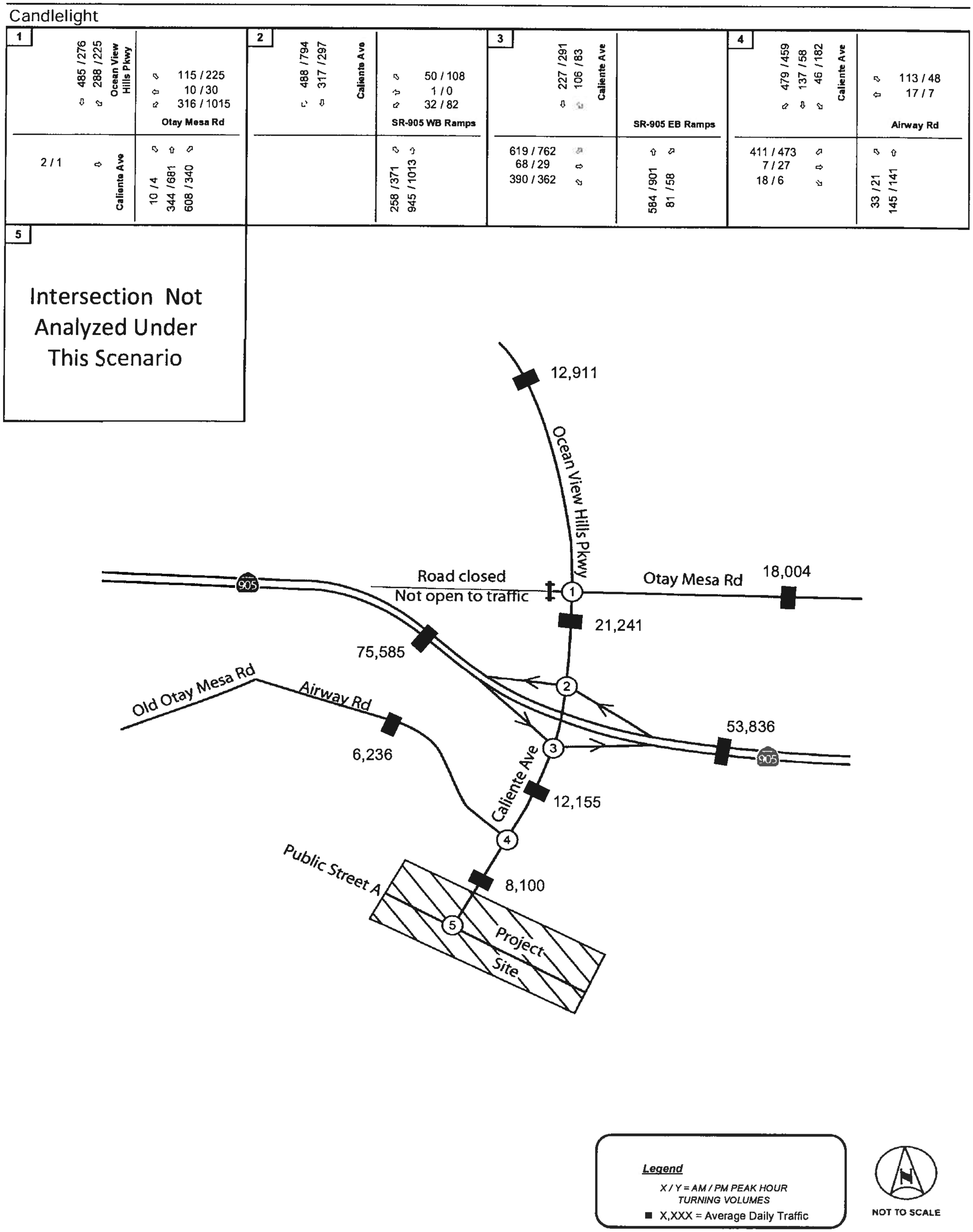

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FIGURE 6-4

Near Term Conditions Traffic Volumes

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Candlelight

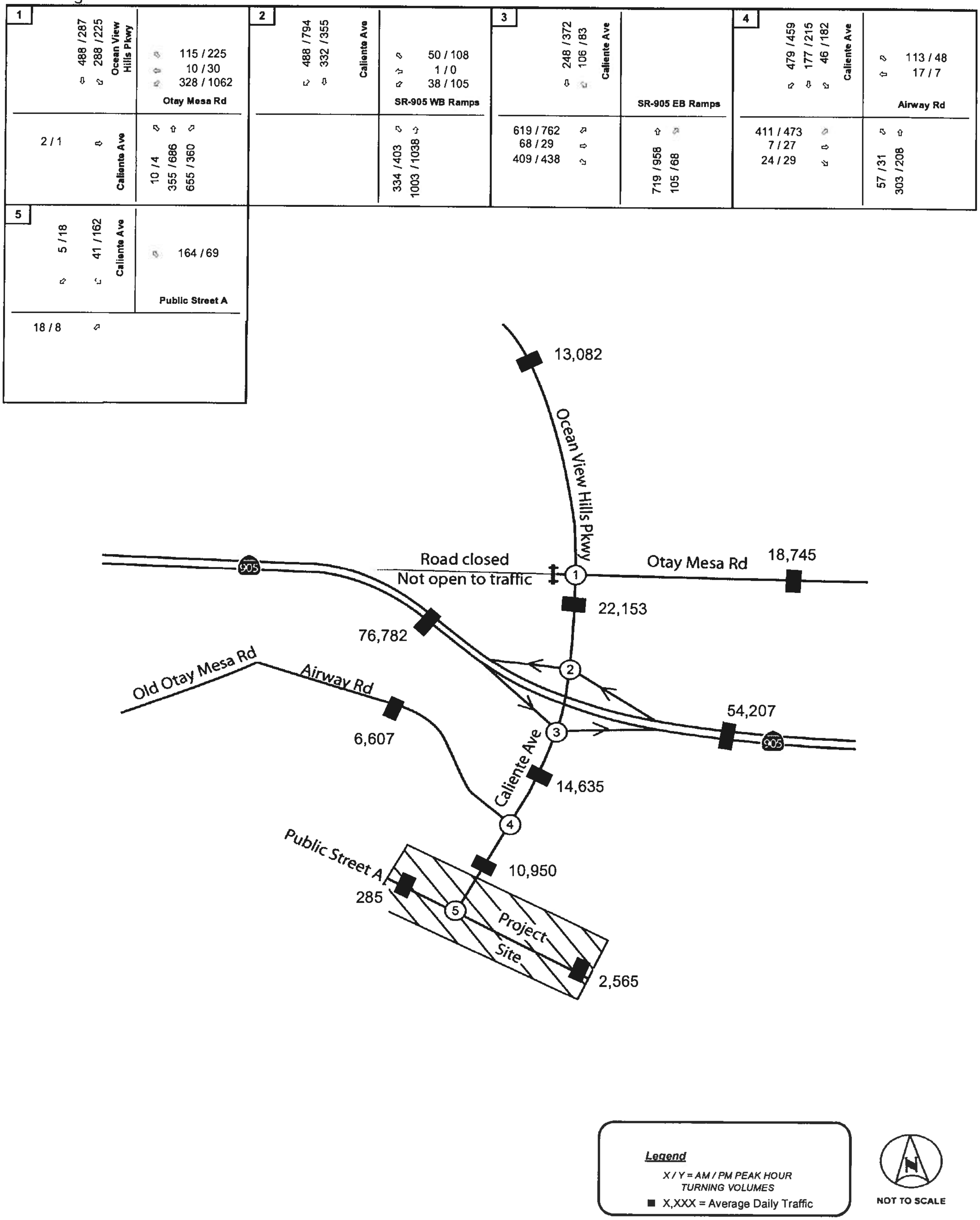

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FIGURE 6-5

Near Term with Project Conditions Traffic Volumes

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Intersection Analysis

Table 6-2 displays the LOS analysis results for the study intersections under the Near Term with and without project conditions. As shown in the table, all intersections would operate at acceptable LOS C or better with and without the addition of the proposed project except for the following intersections:

- Otay Mesa Road and Caliente Avenue (LOS F – both peaks with and without the project); and
- Airway Road and Caliente Avenue (LOS F – both peaks with and without the project).

The project was found to have a direct significant impact at these intersections that would require mitigation.

Appendix C contains the peak-hour intersections LOS calculation worksheets.

Intersecting Lane Vehicle Analysis

Table 6-3 displays the ILV analysis results for the Caltrans-owned signalized intersections under the Near Term with and without project conditions. As shown in the table, both intersections would operate at below and approaching capacity levels with and without the proposed project for both the a.m. and p.m. peak-hour.

Appendix D contains the ILV worksheets.

Roadway Segment Analysis

Table 6-4 displays the roadway segments analysis under Near Term with and without project conditions. As shown in the table, all study roadway segments operate at LOS A with and without the addition of the proposed project.

Freeway Segment Analysis

Table 6-5 displays the freeway segments analysis under the Near Term with and without project conditions. As shown in the table, both directions of both freeway segments in the study area would function at LOS A with and without the addition of the proposed project.

Freeway Ramp Metering Analysis

Freeway ramp metering analysis was not performed for Near Term with Project Conditions. As shown in the freeway analysis, SR-905 is expected to operate at LOS A in the Near Term with and without project conditions. Caltrans should not meter these ramps with a LOS A along the freeways.

TABLE 6-2
NEAR TERM CONDITIONS
PEAK-HOUR INTERSECTION LOS SUMMARY

	INTERSECTION	PEAK HOUR	NEAR TERM BASELINE DELAY (a)	NEAR TERM BASELINE LOS (b)	NEAR TERM PLUS PROJECT DELAY (a)	NEAR TERM PLUS PROJECT LOS (b)	Δ (c)	SIGNIFICANT?
1	Otay Mesa Rd & Caliente Ave	AM	87.0	**F**	88.1	**F**	1.1	**YES**
		PM	82.0	**F**	95.3	**F**	13.3	**YES**
2	SR-905 WB Ramps & Caliente Ave	AM	10.9	B	12.2	B	1.3	NO
		PM	15.0	B	17.4	B	2.4	NO
3	SR-905 EB Ramps & Caliente Ave	AM	21.9	C	24.8	C	2.9	NO
		PM	30.8	C	35.9	D	5.1	NO
4	Airway Rd & Caliente Ave	AM	66.5	**F**	85.7	**F**	19.2	**YES**
		PM	65.3	**F**	93.4	**F**	28.1	**YES**
5	Public Street A & Caliente Ave	AM	Intersection does not exist under this scenario		11.0	B	-	NO
		PM			13.0	B	-	NO

Notes:
Bold values indicate intersections operating at LOS E or F. **Bold and shaded** values indicate project significant impact.
(a) Delay refers to the average control delay for the entire intersection, measured in seconds per vehicle.
(b) LOS calculations are based on the methodology outlined in the *2000 Highway Capacity Manual* and performed using Synchro 7
(c) Change in delay due to addition of project traffic

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TABLE 6-3

NEAR TERM CONDITIONS

PEAK-HOUR ILV SUMMARY

	INTERSECTION	PEAK HOUR	NEAR TERM BASELINE		NEAR TERM PLUS PROJECT		Δ
			ILV TOTAL	CAPACITY	ILV TOTAL	CAPACITY	
2	Caliente Ave & SR-905 WB Ramps	AM	788	Below Capacity	867	Below Capacity	79
		PM	1260	Approaching Capacity	1304	Approaching Capacity	44
3	Caliente Ave & SR-905 EB Ramps	AM	867	Below Capacity	928	Below Capacity	61
		PM	980	Below Capacity	1040	Below Capacity	60

Notes:
Bold values indicate intersections operating above capacity.

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TABLE 6-4
NEAR TERM CONDITIONS
ROADWAY SEGMENT LOS SUMMARY

ROADWAY SEGMENT	ROADWAY CLASSIFICATION	LOS E CAPACITY	NEAR TERM (2014) BASELINE			NEAR TERM (2014) PLUS PROJECT			Δ in ADT	Δ in V/C	SIGNIFICANT?
			ADT	V/C RATIO (a)	LOS	ADT	V/C RATIO (a)	LOS			
Otay Mesa Road											
Caliente Ave to Heritage Rd	6 Lane Prime Arterial	60,000	18,004	0.3	A	18,745	0.312	A	741	0.012	NO
Caliente Avenue											
Otay Mesa Rd to SR-905	6 Lane Prime Arterial	60,000	21,241	0.354	A	22,153	0.369	A	912	0.015	NO
SR-905 to Airway Rd	6 Lane Prime Arterial	60,000	12,155	0.203	A	14,635	0.244	A	2480	0.041	NO
Airway Rd to Public Street A	5 Lane Major Arterial	45,000	8,100	0.18	A	10,950	0.243	A	2850	0.063	NO
Airway Road											
Old Otay Mesa Rd to Caliente Ave	3 Lane Collector	22,500	6,236	0.277	A	6,607	0.294	A	371	0.017	NO
Ocean View Hills Parkway											
Otay Mesa Rd to Hidden Trails Rd	6 Lane Major Arterial	50,000	12,911	0.258	A	13,082	0.262	A	171	0.004	NO

Notes:
Bold values indicate roadway segments operating at LOS E or F. **Bold and shaded** values indicate a project significant impact
(a) The v/c Ratio is calculated by dividing the ADT volume by each respective roadway segment's capacity

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TABLE 6-5
NEAR TERM CONDITIONS
FREEWAY SEGMENT ANALYSIS SUMMARY

FREEWAY SEGMENT	DIRECTION	NUMBER OF LANES	CAPACITY (a)	BASELINE ADT	NEAR TERM BASELINE						PROJECT PEAK-HOUR VOLUME		NEAR TERM WITH PROJECT						V/C RATIO Δ		SIGNIFICANT?
					AM PEAK			PM PEAK					AM PEAK			PM PEAK					
					PEAK-HOUR VOLUME (b)	V/C RATIO	LOS	PEAK-HOUR VOLUME (b)	V/C RATIO	LOS	AM	PM	PEAK-HOUR VOLUME	V/C RATIO	LOS	PEAK-HOUR VOLUME	V/C RATIO	LOS	AM	PM	
SR-905																					
I-805 to Caliente Ave	WB	3 M	7,050	75,585	2,136	0.303	A	2,980	0.423	B	76	32	2,212	0.314	A	3,012	0.427	B	0.011	0.005	--
	EB	3 M	7,050	75,585	2,797	0.397	A	2,590	0.367	A	19	76	2,816	0.399	A	2,665	0.378	A	0.003	0.011	--
Caliente Ave to Britannia Blvd	WB	3 M	7,050	53,836	1,521	0.216	A	2,122	0.301	A	6	23	1,527	0.217	A	2,146	0.304	A	0.001	0.003	--
	EB	3 M	7,050	53,836	1,992	0.283	A	1,845	0.262	A	24	10	2,016	0.286	A	1,855	0.263	A	0.003	0.001	--

Notes:
Bold values indicate freeway segments operating at LOS E or F.
M= Main lane, A= Auxiliary lane; T=Truck lane
(a) The capacity is calculated as 2,350 vehicles per hour per lane (vhpl) for the main lanes, at 1,800 vhpl per auxiliary lanes, and at 1,600 vhpl per truck lanes and HOV lanes
(b) Peak-hour volumes taken from the San Diego - Tijuana Cross Border Facility Project Traffic Impact Study and adjusted to remove the existing land use at the project site.

Mitigation

Intersections

Based on the current City's guidelines, there would be a significant direct project traffic impact at the following intersections under the Near Term with Project scenario:

- Otay Mesa Road and Caliente Avenue; and
- Airway Road and Caliente Avenue

To mitigate its significant direct traffic impact at the Otay Mesa Road and Caliente Avenue intersection, the proposed project would remove the crosswalk on the south leg of the intersection and stripe a crosswalk on the west leg of the intersection. The signal timing can then be adjusted to provide less green time for the eastbound through movement and more green time for the westbound left-turn movement.

To mitigate its significant direct traffic impact at the Airway Road and Caliente Avenue intersection, the proposed project would signalize the intersection and stripe the northbound, southbound, and westbound approaches to their ultimate width. The pavement width to stripe the additional lanes is assumed to already be in place from the widening performed by the Southview project. A signal warrant analysis is included in **Appendix G. Conceptual exhibits showing the proposed improvements are included in Appendix J.**

The Near Term mitigated intersection geometrics are shown in **Figure 6-6**. **Table 6-6** shows the improved operations of the affected intersections with the proposed mitigation measures. As shown in the table, the intersections would operate at a LOS D or better with the proposed mitigation measures. The improvements would mitigate the project's traffic impacts and improve the operations to better than without the project.

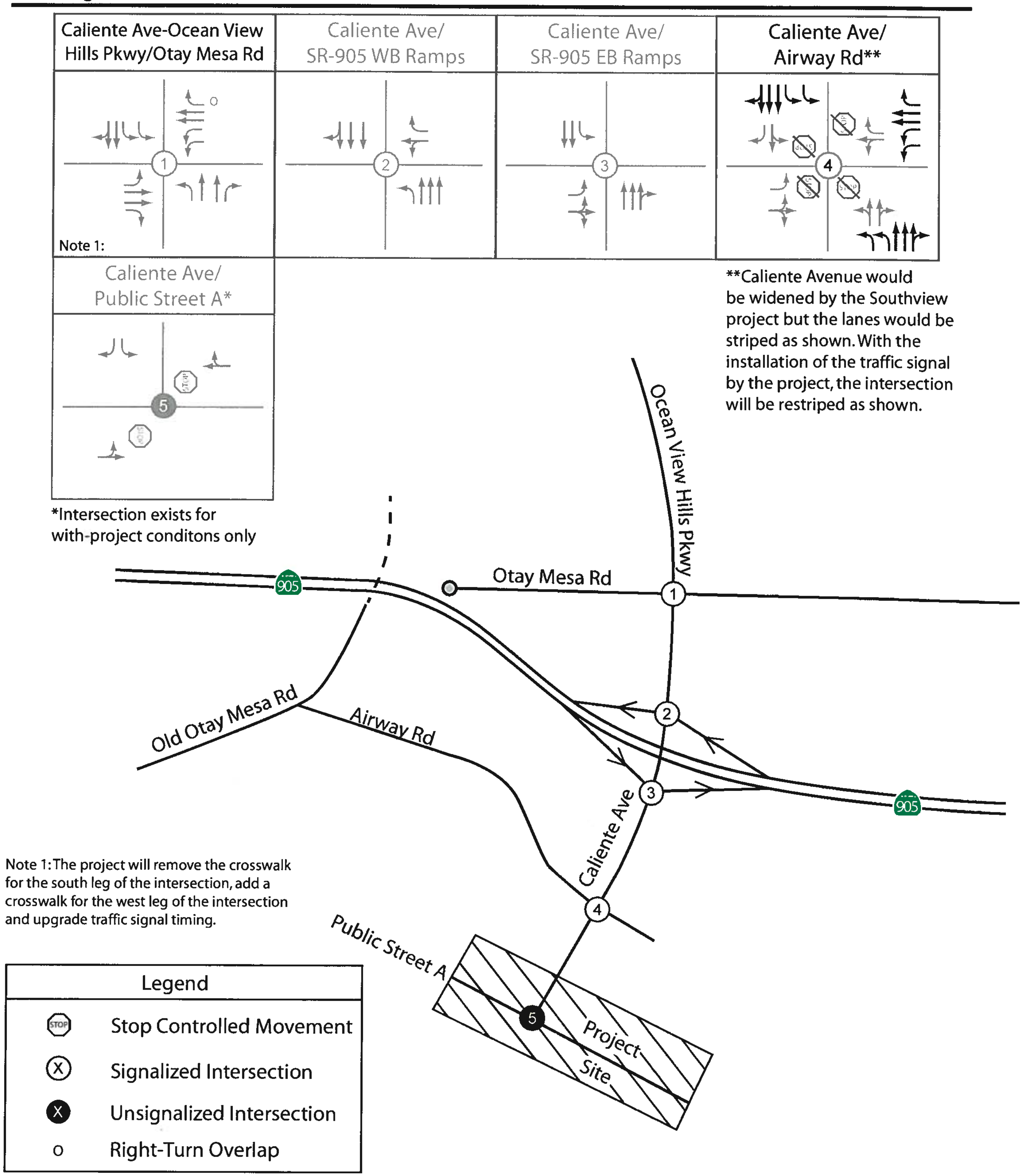
Caliente Ave-Ocean View Hills Pkwy/Otay Mesa Rd
Note 1:
Caliente Ave/ SR-905 WB Ramps
Caliente Ave/ SR-905 EB Ramps
Caliente Ave/ Airway Rd**
Caliente Ave/ Public Street A*
**Caliente Avenue would be widened by the Southview project but the lanes would be striped as shown. With the installation of the traffic signal by the project, the intersection will be restriped as shown.
*Intersection exists for with-project conditons only
Ocean View Hills Pkwy
Otay Mesa Rd
905
Old Otay Mesa Rd
Airway Rd
Caliente Ave
Public Street A
Project Site
Note 1: The project will remove the crosswalk for the south leg of the intersection, add a crosswalk for the west leg of the intersection and upgrade traffic signal timing.
Legend
Stop Controlled Movement
Signalized Intersection
Unsignalized Intersection
Right-Turn Overlap

TABLE 6-6

NEAR TERM CONDITIONS MITIGATED

PEAK-HOUR INTERSECTION LOS SUMMARY

	INTERSECTION	PEAK HOUR	NEAR TERM BASELINE		NEAR TERM WITH PROJECT		NEAR TERM WITH PROJECT AFTER MITIGATION		DESCRIPTION
			DELAY (a)	LOS (b)	DELAY (a)	LOS (b)	DELAY (a)	LOS (b)	
1	Otay Mesa Rd & Caliente Ave	AM	87.0	**F**	88.1	**F**	31.1	C	Remove crosswalk on south leg of intersection, add crosswalk to west leg of intersection, and adjust signal timing to provide more green time for the westbound left turn movement.
		PM	82.0	**F**	95.3	**F**	54.7	D	
4	Airway Rd & Caliente Ave	AM	66.5	**F**	85.7	**F**	17.3	B	Install a traffic signal and stripe additional lanes. (It is assumed that widening of Caliente Avenue and Airway Road to accommodate additional lanes will be constructed by the Southview project).
		PM	65.3	**F**	93.4	**F**	18.3	B	

Notes:

Bold values indicate intersections operating at LOS E or F.

(a) Delay refers to the average control delay for the entire intersection, measured in seconds per vehicle.

(b) LOS calculations are based on the methodology outlined in the *2000 Highway Capacity Manual* and performed using Synchro 7

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7.0 HORIZON YEAR (YEAR 2035) CONDITIONS

This section provides a description of the 2035 with the addition of the proposed project.

Road Network

It is assumed that with the construction of the Southview project, Caliente Avenue will be widened between Airway Road and the Southview southern boundary (this project's northern boundary) to a five-lane major facility with three northbound lanes and two southbound lanes. Also, as part of the Southview project, the fourth leg of the Airway Road and Caliente Avenue intersection will be constructed. **Figure 7-1** shows the intersection geometrics assumed to be in place by the Horizon Year (Year 2035) scenario.

Traffic Volumes

The Horizon Year (Year 2035) Baseline peak-hour volumes at the study intersections and the Average Daily Traffic (ADT) volumes on the study roadway segments were extracted from the Series 11 Forecast Model prepared for the City of San Diego based on the land used included in the Adopted Otay Mesa Community Plan. The volumes included in the Forecast Model represent the future buildout conditions of the Otay Mesa Community that for planning purposes is expected by the Year 2050. To estimate the Year 2035 volumes (Horizon Year project conditions), the Buildout volumes were reduced linearly between the year 2014 and 2050. A copy of the forecast model plot showing the forecasted ADT volumes is included in **Appendix A.**

To estimate the Horizon Year turning movement volumes at the study intersections, the existing turning movements at each respective study intersection were factored up based on the projected Average Daily Traffic (ADT) volumes along each segment. Each respective movement was derived using an iterative approach that balances the inflows and outflows for each approach. The input values include the existing turning movement volumes and future year peak-hour approach and departure volumes along each leg of the intersection. The future peak-hour approach volumes would be estimated by applying the existing peak-hour factor (K-factor) and directional distributional percentage (D-factor) to the future ADT volumes along each approach. A more detailed description of the methodology used to forecast turning movement volumes is contained in National Cooperative Highway Research Program (NCHRP) 255 Highway Traffic Data for Urbanized Area Project Planning and Design, Chapter 8. An Excel model computes the forecast turning volumes from existing turning movement volumes and forecasted approach and departure volumes by the techniques described in NCHRP 255. As a conservative approach, if a turning movement volume produced by this model was less than the existing count for that movement, manual adjustments were made to assure that all forecast horizon year volumes would be equal or greater than the existing turning movement counts. A copy of the excel calculation worksheets are included in **Appendix A**.

Figure 7-2 illustrates the Horizon Year (Year 2035) Baseline conditions traffic volumes at the study intersections, and roadway and freeway segments.

To determine the traffic volumes under the Horizon Year (Year 2035) with Project scenario, the trips associated with the project were added to the Horizon Year (Year 2035) Baseline volumes. **Figure 7-3** illustrates the Horizon Year (Year 2035) with Project traffic volumes at the study intersections, and roadway and freeway segments.

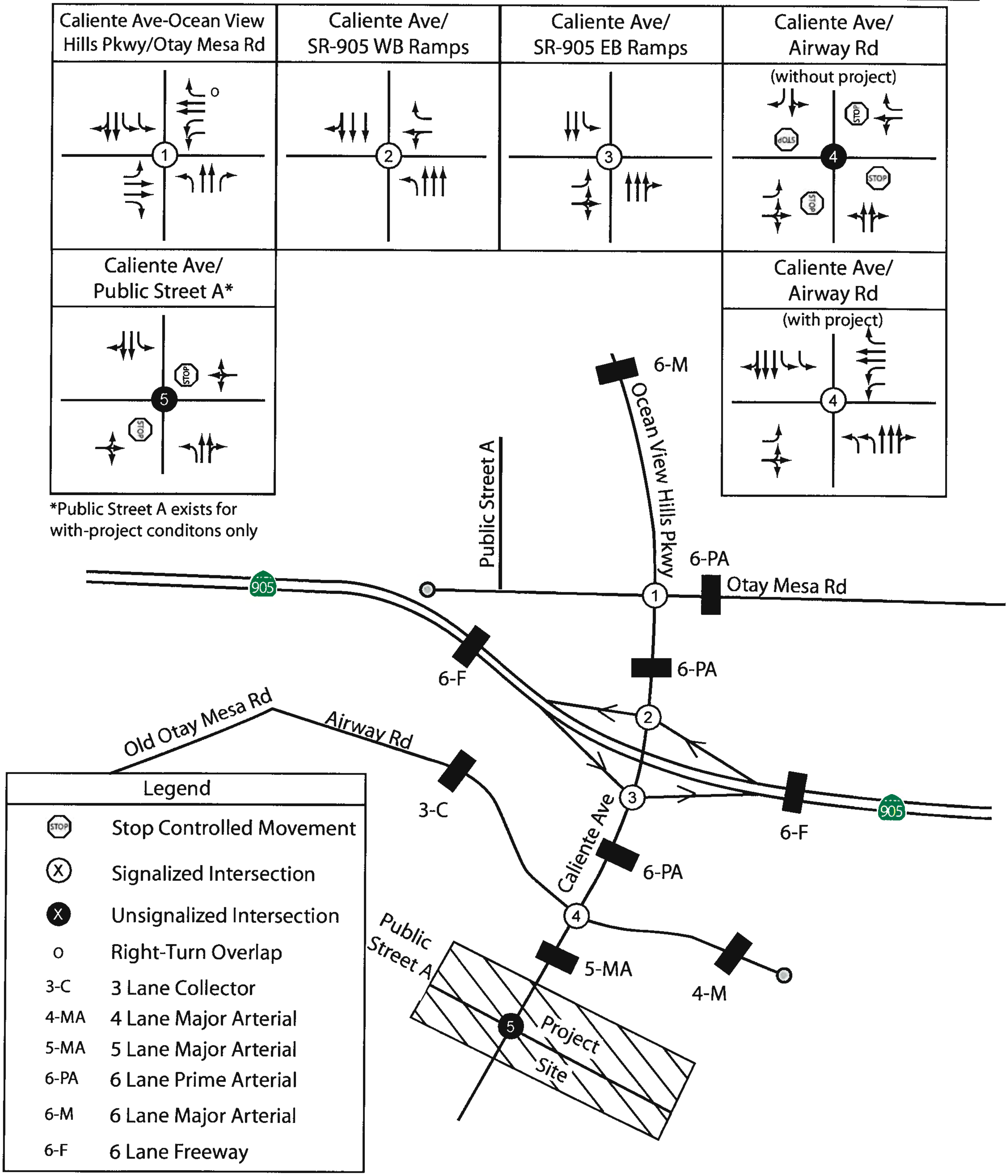

FIGURE 7-1
Horizon Year Conditions Intersection and Roadway Geometrics

Candlelight

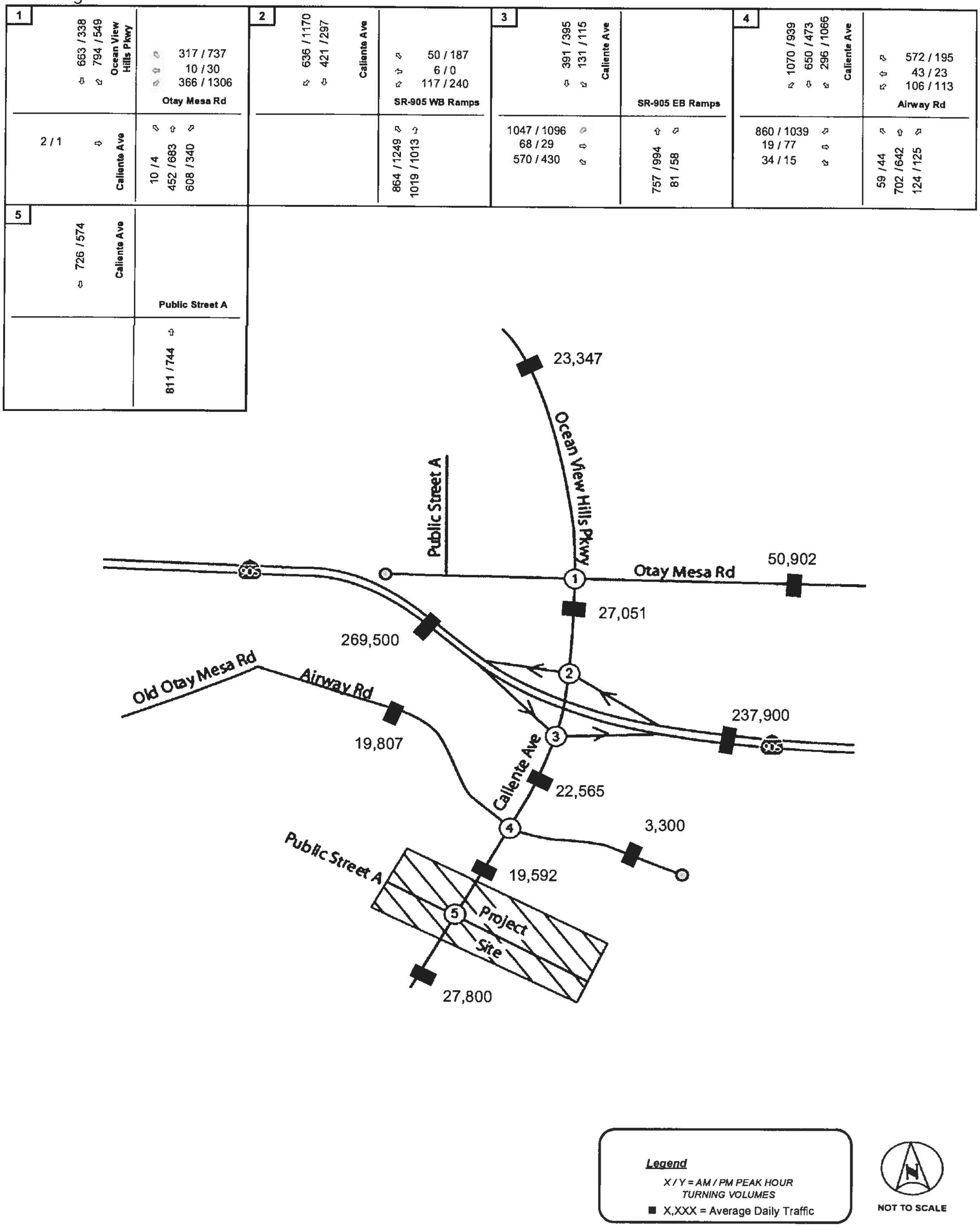

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FIGURE 7-2

Horizon Year (Year 2035) Conditions Traffic Volumes

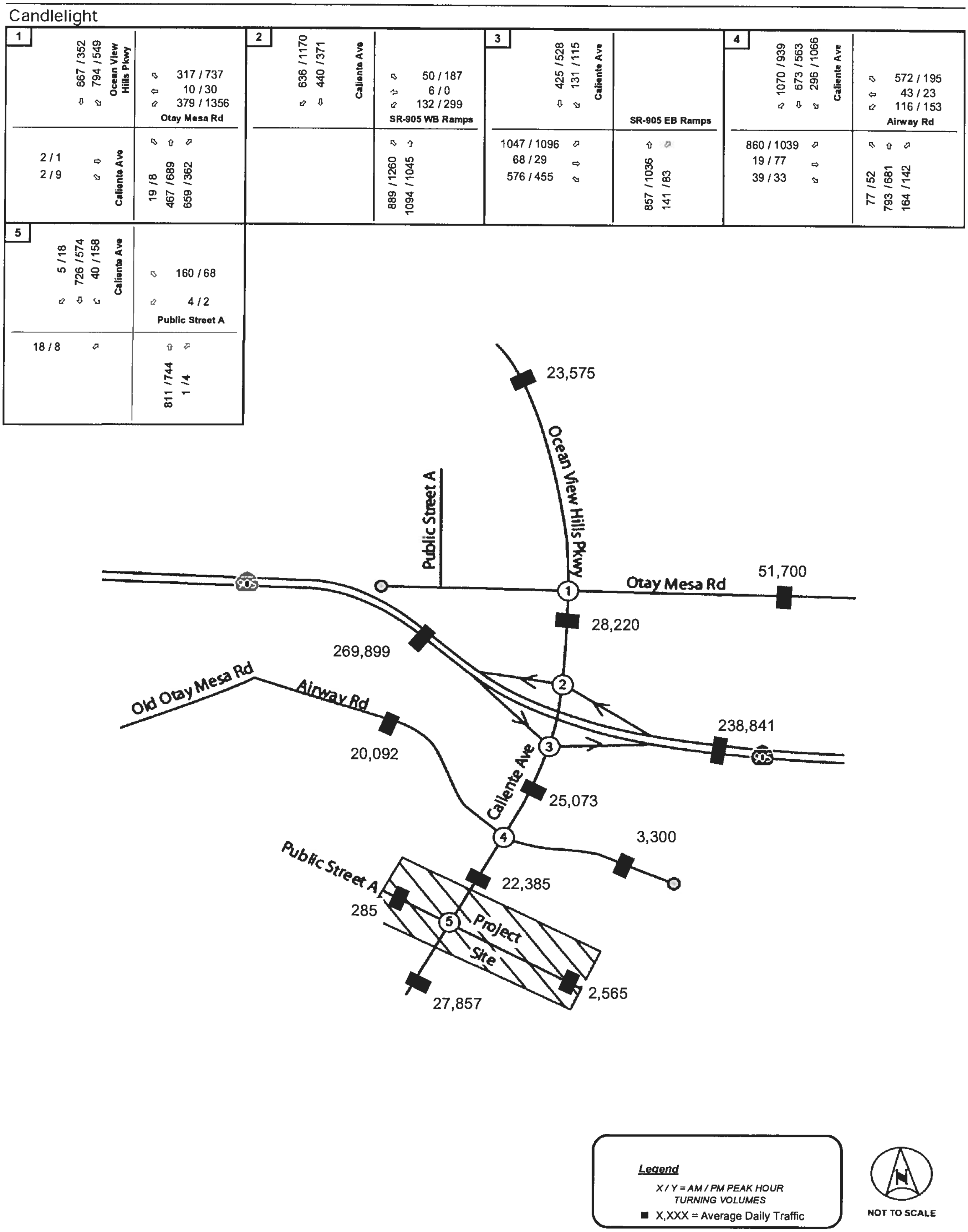

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FIGURE 7-3
Horizon Year (Year 2035) with Project Conditions Traffic Volumes

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Intersection Analysis

Table 7-1 displays the LOS analysis results for the study intersections under the Horizon Year with and without project conditions. As shown in the table, all intersections would operate at an unacceptable LOS F with and without the addition of the proposed project with the exception of SR-905 EB ramps and Caliente Avenue which would operate at LOS D or better. All of the failing intersections have a significant cumulative impact and would need to be mitigated.

Appendix C contains the peak-hour intersections LOS calculation worksheets.

Intersecting Lane Vehicle Analysis

Table 7-2 displays the ILV analysis results for the Caltrans-owned signalized intersections under the Horizon Year with and without project conditions. As shown in the table, Caliente Avenue and SR-905 westbound ramps would operate at above capacity levels with and without the proposed project. Caliente Avenue and SR-905 eastbound ramps would operate at approaching capacity levels with and without the proposed project.

Appendix D contains the ILV worksheets.

Roadway Segment Analysis

Table 7-3 displays the roadway segments analysis under Horizon Year with and without project conditions. As shown in the table, all study roadway segments operate at LOS D or better with and without the addition of the proposed project except for the following roadway segments:

- Airway Road between Old Otay Mesa Road and Caliente Avenue (LOS E with and without the project).

The increase in traffic related to the proposed project will not exceed the allowable threshold by the City of San Diego. Thus, it will not be considered a cumulative impact that would require mitigation.

Freeway Segment Analysis

Table 7-4 displays the freeway segments analysis under the Horizon Year with and without project conditions. As shown in the table, both directions of both freeway segments in the study area would function at LOS F with and without the addition of the proposed project. Based on the City's criteria, the project traffic does increase the freeways v/c ratio enough to be considered to be a significant cumulative impact between Caliente Avenue and Britannia Boulevard during the afternoon peak-hour period that would require mitigation.

Freeway Ramp Metering Analysis

Table 7-5 displays the ramp metering analysis for the metered freeway ramps under the Horizon Year with and without the project conditions. As shown in the table, the Caliente Avenue and SR-905 westbound ramp is projected to have demand greater than the ramp meter rate, resulting in queuing and expected delays for both peak hours. Based on the City's criteria, there would be a significant cumulative impact on the westbound ramp during the a.m. peak-hour that would require mitigation.

TABLE 7-1
HORIZON YEAR (YEAR 2035) CONDITIONS
PEAK-HOUR INTERSECTION LOS SUMMARY

INTERSECTION		PEAK HOUR	HORIZON YEAR BASELINE		HORIZON YEAR PLUS PROJECT			
			DELAY (a)	LOS (b)	DELAY (a)	LOS (b)	Δ (c)	SIGNIFICANT?
1	Otay Mesa Rd & Caliente Ave	AM	101.0	**F**	126.6	**F**	25.6	**YES**
		PM	153.6	**F**	158.5	**F**	4.9	**YES**
2	SR-905 WB Ramps & Caliente Ave	AM	35.8	D	38.9	D	3.1	NO
		PM	154.9	**F**	170.6	**F**	15.7	**YES**
3	SR-905 EB Ramps & Caliente Ave	AM	46.5	D	50.3	D	3.8	NO
		PM	40.5	D	43.4	D	2.9	NO
4	Airway Rd & Caliente Ave	AM	622.3	**F**	102.8	**F**	-519.5	NO
		PM	890.0	**F**	87.2	**F**	-802.8	NO
5	Public Street A & Caliente Ave	AM	Intersection does not exist under this scenario		51.2	**F**	51.2	**YES**
		PM			ECL	**F**	ECL	**YES**

Notes:
Bold values indicate intersections operating at LOS E or F. **Bold and shaded** values indicate project significant impact.
ECL = Exceeds Calculable Limit.
(a) Delay refers to the average control delay for the entire intersection, measured in seconds per vehicle.
(b) LOS calculations are based on the methodology outlined in the *2000 Highway Capacity Manual* and performed using Synchro 7
(c) Change in delay due to addition of project traffic

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TABLE 7-2

HORIZON YEAR (YEAR 2035) CONDITIONS

PEAK-HOUR ILV SUMMARY

	INTERSECTION	PEAK HOUR	HORIZON YEAR BASELINE		HORIZON YEAR PLUS PROJECT		Δ
			ILV TOTAL	CAPACITY	ILV TOTAL	CAPACITY	
2	Caliente Ave & SR-905 WB Ramps	AM	1623	**Above Capacity**	1663	**Above Capacity**	40
		PM	2658	**Above Capacity**	2729	**Above Capacity**	71
3	Caliente Ave & SR-905 EB Ramps	AM	1254	Approaching Capacity	1310	Approaching Capacity	56
		PM	1244	Approaching Capacity	1278	Approaching Capacity	34

Notes:

Bold values indicate intersections operating above capacity.

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TABLE 7-3
HORIZON YEAR (YEAR 2035) CONDITIONS
ROADWAY SEGMENT LOS SUMMARY

ROADWAY SEGMENT	ROADWAY CLASSIFICATION	LOS E CAPACITY	YEAR 2035 BASELINE			YEAR 2035 PLUS PROJECT			Δ in ADT	Δ in V/C	SIGNIFICANT?
			ADT	V/C RATIO (a)	LOS	ADT	V/C RATIO (a)	LOS			
Otay Mesa Road											
Public Street A to Caliente Ave	6 Lane Prime Arterial	60,000	22,174	0.370	A	22,317	0.372	A	143	0.002	NO
Caliente Ave to Heritage Rd	6 Lane Prime Arterial	60,000	50,902	0.848	D	51,700	0.862	D	798	0.014	NO
Caliente Avenue											
Otay Mesa Rd to SR-905	6 Lane Prime Arterial	60,000	27,051	0.451	B	28,220	0.47	B	1169	0.019	NO
SR-905 to Airway Rd	6 Lane Prime Arterial	60,000	22,565	0.376	A	25,073	0.418	B	2508	0.042	NO
Airway Rd to Public Street A	5 Lane Major Arterial	45,000	19,592	0.435	B	22,385	0.497	B	2793	0.062	NO
Airway Road											
Old Otay Mesa Rd to Caliente Ave	3 Lane Collector	22,500	19,807	0.880	**E**	20,092	0.893	**E**	285	0.013	NO
Caliente Ave to Heritage Rd	4 Lane Major Arterial	40,000	32,200	0.805	D	32,200	0.805	D	0	0.000	NO
Ocean View Hills Parkway											
Otay Mesa Rd to Hidden Trails Rd	6 Lane Major Arterial	50,000	23,347	0.467	B	23,575	0.472	B	228	0.005	NO

Notes:
Bold values indicate roadway segments operating at LOS E or F. **Bold and shaded** values indicate a project significant impact
(a) The v/c Ratio is calculated by dividing the ADT volume by each respective roadway segment's capacity.

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TABLE 7-4
HORIZON YEAR (YEAR 2035) CONDITIONS
FREEWAY SEGMENT ANALYSIS SUMMARY

FREEWAY SEGMENT	DIRECTION	NUMBER OF LANES	CAPACITY (a)	HORIZON YEAR (YEAR 2035) BASELINE						PROJECT PEAK-HOUR VOLUME		HORIZON YEAR (YEAR 2035) WITH PROJECT						V/C RATIO Δ		SIGNIFICANT?
				AM PEAK			PM PEAK					AM PEAK			PM PEAK					
				PEAK-HOUR VOLUME (b)	V/C RATIO	LOS	PEAK-HOUR VOLUME (b)	V/C RATIO	LOS	AM	PM	PEAK-HOUR VOLUME	V/C RATIO	LOS	PEAK-HOUR VOLUME	V/C RATIO	LOS	AM	PM	
SR-905																				
I-805 to Caliente Ave	WB	3 M	7,050	5,593	0.793	C	8,399	1.191	**F0**	25	11	5,618	0.797	C	8,410	1.193	**F0**	0.004	0.002	NO
	EB	3 M	7,050	8,380	1.189	**F0**	5,614	0.796	C	6	25	8,386	1.190	**F0**	5,639	0.800	C	0.001	0.004	NO
Caliente Ave to Britannia Blvd	WB	3 M	7,050	4,938	0.700	C	7,416	1.052	**F0**	15	59	4,953	0.703	C	7,475	1.060	**F0**	0.002	0.008	**YES**
	EB	3 M	7,050	7,397	1.049	**F0**	4,959	0.703	C	60	25	7,457	1.058	**F0**	4,984	0.707	C	0.009	0.004	**YES**

Notes:
Bold values indicate freeway segments operating at LOS E or F.
M= Main lane; A= Auxiliary lane; T=Truck lane
(a) The capacity is calculated as 2,350 vehicles per hour per lane (vhpl) for the main lanes, at 1,800 vhpl per auxiliary lanes, and at 1,600 vhpl per truck lanes and HOV lanes
(b) Peak-hour volumes taken from the San Diego - Tijuana Cross Border Facility Project Traffic Impact Study and adjusted to remove the existing land use at the project site.

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TABLE 7-5
HORIZON YEAR CONDITIONS
PEAK-HOUR RAMP METERING ANALYSIS SUMMARY

ON-RAMP	PEAK PERIOD	NUMBER OF LANES (SOV)	METER RATE[1] (veh/hr/ln)	BASELINE DEMAND[2] (veh/hr)	EXCESS BASELINE DEMAND (veh/hr)	AVERAGE BASELINE DELAY (min)	AVERAGE BASELINE QUEUE	WITH PROJECT DEMAND[2] (veh/hr)	EXCESS WITH PROJECT DEMAND (veh/hr)	AVERAGE WITH PROJECT DELAY (min)	FREEWAY LOS	Δ IN DELAY WITH PROJECT (min)	SIGNIFICANT ?	AVERAGE WITH PROJECT QUEUE
Caliente Ave & SR-905 WB Ramp	AM	1	480	1506	1026	128.3	25,650 ft	1531	1051	131.4	C	3.1	NO	26,275 ft
	PM	1	480	2419	1939	242.4	48,475 ft	2430	1950	243.8	F0	1.4	YES	48,750 ft
Caliente Ave & SR-905 EB Ramp	AM	1	480	280	0	0.0	0 ft	340	0	0.0	F0	0.0	NO	0 ft
	PM	1	480	202	0	0.0	0 ft	227	0	0.0	C	0.0	NO	0 ft

Notes:

1) Meter rates were provided by Caltrans. The meter rates for these locations are based on typical ramp metering operations. It is assumed that 2 vehicles per green will be allowed. The meter rates for a 2 vehicle per green operation ranges from 480 vehicles per hour per lane to 900 vehicles per hour per lane. The meter rate used in the analysis represent average service rate.

2) Demand is the peak hour demand expected to use the on-ramp

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Mitigation

Intersections

Based on the current City guidelines, there would be a significant cumulative project traffic impact at the following intersections under the Horizon Year scenario:

- Otay Mesa Road and Caliente Avenue;
- SR-905 WB Ramps and Caliente Avenue; and
- Caliente Avenue and Public Street A.

To mitigate its significant cumulative traffic impact at the Otay Mesa Road and Caliente Avenue intersection, the proposed project will pay its fair share contribution of **5.23** percent towards installing an overlap phase for the northbound right-turn movement; this improvement also restricts U-turns for the westbound left-turn. This improvement will be in addition to the project mitigation identified for the Near Term impacts.

To mitigate its significant cumulative traffic impact at the SR-905 WB Ramps and Caliente Avenue intersection, the proposed project could pay its fair-share contribution of **7.65**-percent toward the construction of an exclusive southbound right-turn lane and striping modifications to Caliente Avenue to provide a second southbound right-turn lane and a second northbound left-turn lane. However, these impact are considered unmitigated since there are not currently planned or funded projects to expand the SR-905/Caliente Avenue interchange.

To mitigate its significant cumulative traffic impact at the Caliente Avenue and Public Street A intersection, the proposed project will install a traffic signal when it becomes warranted. A signal warrant analysis is included in **Appendix G.**

Fair share calculations are shown in **Appendix E.** The Horizon Year mitigated intersection geometrics are shown in **Figure 7-4**.

The improvements described above would mitigate the project's cumulative traffic impacts to the intersections within the study area by improving the operations to better than the baseline condition. **Table 7-6** shows the improved operations of the affected intersections with the proposed mitigation measures.

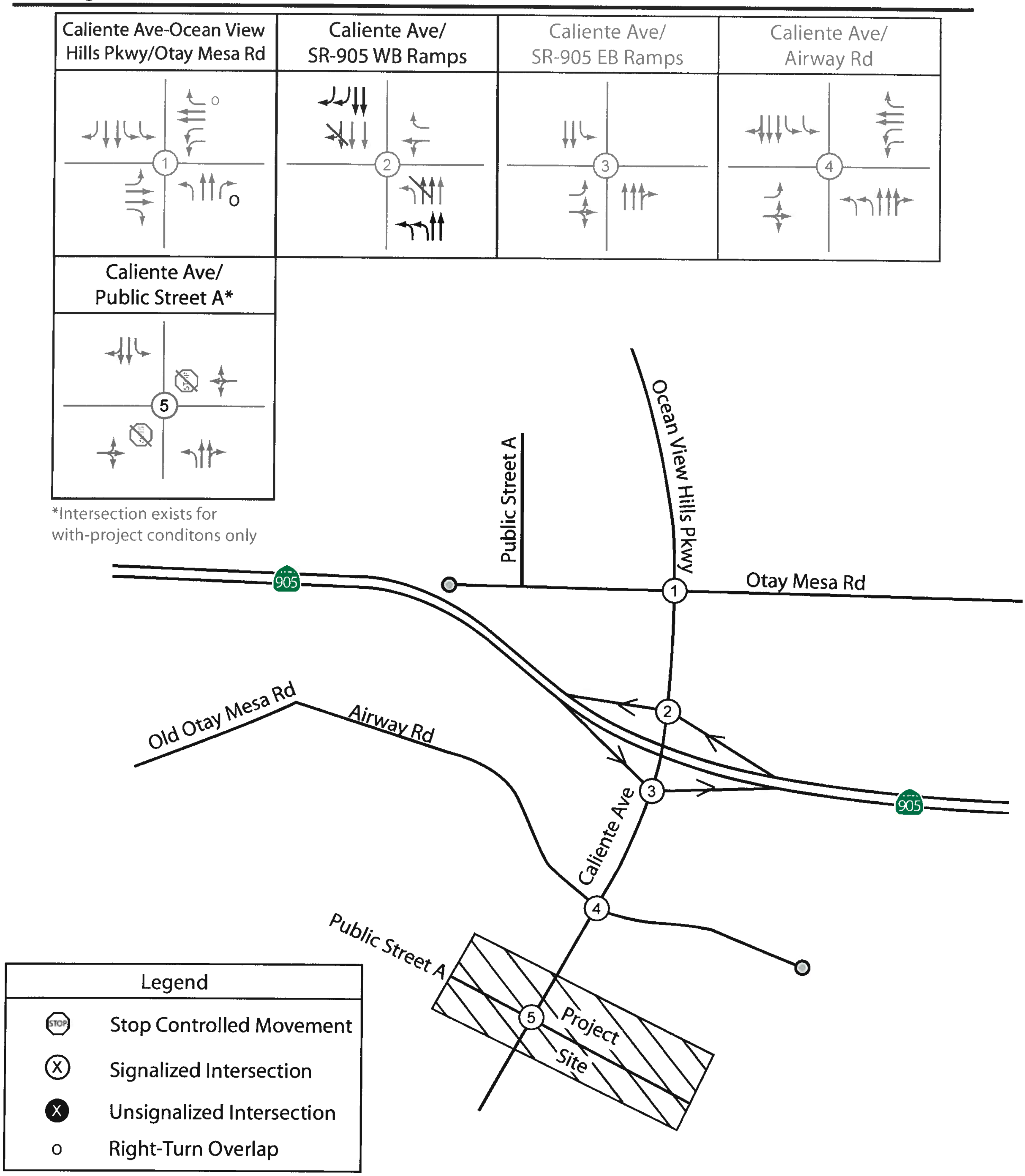

FIGURE 7-4
Mitigated Horizon Year Conditions Intersection Geometrics

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TABLE 7-6

HORIZON YEAR (YEAR 2035) CONDITIONS MITIGATED

PEAK-HOUR INTERSECTION LOS SUMMARY

	INTERSECTION	PEAK HOUR	HORIZON YEAR BASELINE		HORIZON YEAR WITH PROJECT		HORIZON YEAR WITH PROJECT AFTER MITIGATION		DESCRIPTION
			DELAY (a)	LOS (b)	DELAY (a)	LOS (b)	DELAY (a)	LOS (b)	
1	Otay Mesa Rd & Caliente Ave	AM	101.0	**F**	126.6	**F**	91.3	**F**	Pay fair share contribution toward the addition of an overlap phase to northbound.
		PM	153.6	**F**	158.5	**F**	101.1	**F**	
2	SR-905 WB Ramps & Caliente Ave	AM	35.8	D	38.9	D	20.4	C	Pay fair share toward the addition of an exclusive southbound right-turn lane and the restriping of the inside northbound thru-turn lane to a dual northbound left-turn lane.
		PM	154.9	F	170.6	**F**	53.4	D	
5	Public Street A & Caliente Ave	AM	Intersection does not exist under this scenario		51.2	**F**	6.6	A	Pay 50 percent of the installation of a traffic signal.
		PM			ECL	**F**	7.3	A	

Notes:

Bold values indicate intersections operating at LOS E or F

ECL = Exceeds Calculable Limit.

(a) Delay refers to the average control delay for the entire intersection, measured in seconds per vehicle

(b) LOS calculations are based on the methodology outlined in the *2000 Highway Capacity Manual* and performed using Synchro 7

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Freeway Segments

Based on the current City's guidelines, there would be a significant cumulative project traffic impact at along the SR-905 freeway between Caliente Avenue and Britannia Boulevard during the p.m. peak-hour under the Horizon Year scenario. These impacts are considered unmitigated since there are not currently planned or funded projects to expand SR-905 by SANDAG or Caltrans which the project could pay a fair share contribution toward the improvements.

Freeway Ramp Metering

Based on the current City's guidelines, there would be a significant cumulative project traffic impact at the westbound on ramp at the intersection of Caliente Avenue and SR-905 WB Ramps during the a.m. peak-hour under the Horizon Year scenario. In order to mitigate this project impact, the proposed project could pay its fair share to widen the on ramp and provide a second westbound lane. This ramp metering improvement coincides with the intersection improvement at Caliente Avenue and SR-905 WB Ramps. According to the intersection analysis, the projects fair-share for the ramp widening improvement is **2.60-**percent of the total construction cost. **Table 7-8** shows the improved operations of the affected freeway ramp with the proposed mitigation measures. However, these impacts are considered unmitigated since there are not currently planned or funded projects to expand this ramp. The ramp expansion would require a reconfiguration of the SR-905/Caliente Avenue interchange.

TABLE 7-7
HORIZON YEAR (YEAR 2035) MITIGATED CONDITIONS
FREEWAY RAMPS LOS SUMMARY

ON-RAMP	PEAK PERIOD	NUMBER OF LANES (SOV)	METER RATE[1] (veh/hr/ln)	BASELINE DEMAND[2] (veh/hr)	EXCESS BASELINE DEMAND (veh/hr)	AVERAGE BASELINE DELAY (min)	WITH PROJECT DEMAND[2] (veh/hr)	EXCESS WITH PROJECT DEMAND (veh/hr)	AVERAGE WITH PROJECT DELAY (min)	FREEWAY LOS	Δ IN DELAY WITH PROJECT (min)	SIGNIFICANT ?	AVERAGE WITH PROJECT QUEUE
Caliente Ave & SR-905 WB Ramp	AM	2	480	1506	546	**68.3**	1531	571	**71.4**	C	3.1	–	14,275 ft
	PM	2	480	2419	1459	**182.4**	2430	1470	**183.8**	**F0**	1.4	**YES**	36,750 ft
Caliente Ave & SR-905 EB Ramp	AM	1	480	280	0	0.0	340	0	0.0	**F0**	0.0	–	0 ft
	PM	1	480	202	0	0.0	227	0	0.0	C	0.0	–	0 ft

Notes:
1) Meter rate is the assumed peak hour capacity expected to be processed through the ramp meter
2) Demand is the peak hour demand expected to use the on-ramp

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8.0 OTHER ISSUES

The following section discusses on-site circulation, parking and transit for the proposed project and its vicinity area.

Site Access and On-site Circulation

Public Street A will be constructed at the southern end of Caliente Avenue as two-lane Collector Street. The proposed project site will be constructed as three separate lots with independent access to Public Street A or Caliente Avenue. The following is the description of the access and on-site circulation for each of the three lots:

- Lot 1: This lot is located along the west side of Caliente Avenue. Two driveway accesses will be provided for this lot. The portion of Public Street A west of Caliente Avenue would be constructed as a 2-lane collector without the two-way left-turn lane. The project will construct40 feet of pavement width west of Caliente Avenue. The portion of Public Street A east of Caliente Avenue would be constructed as a 2-lane collector with a two-way left-turn lane. The project will construct 49 feet of pavement east of Caliente Avenue. One right-in/right-out only access will be provided along the west side of Caliente Avenue just north of Public Street A. The second access will be provided along the north side of Public Street A between Caliente Avenue and the western cul-de-sac of Public Street A to be constructed by the project. An internal circulation road will be provided around the site connecting the two driveways and providing access to all the individual buildings and parking areas. The on-site circulation was found to be adequate for the proposed development.

- Lot 2: This lot is located along the east side of Caliente Avenue. Two driveway accesses will be provided for this lot. Both access locations will be provided along the north side of Public Street A. An internal circulation road will be provided around the site connecting the two driveways and providing access to all the individual buildings and parking areas. The on-site circulation was found to be adequate for the proposed development.

- Lot 3: This lot is located east of Lot 2 at the eastern end of Public Street A. Two driveway accesses will be provided for this lot. Both access locations will be provided along the north side of Public Street A, one to be provided within the easternmost cul-de-sac to be constructed by the project. An internal circulation road will be provided along the center of the site connecting the two driveways and providing access to all the individual buildings and parking areas. The on-site circulation was found to be adequate for the proposed development.

Transit and Other Modes

Transit service is not currently provided within the vicinity of the proposed project. The closest transit service is the MTS Route 905which operates along Otay Mesa Road. Route 905 connects the Iris Avenue Blue Line Trolley Station with the Otay Mesa Border Crossing. The closest stop to the proposed project is a bus stop located near the intersection of Otay Mesa Road and Corporate Center Drive, referred to as Otay Mesa Rd. & Heritage Rd. on the bus schedule. This bus stop is located approximately 4,000 feet from the Candlelight project site. Route 905 operates on weekdays from 4:39 a.m. to 7:38 p.m. with a frequency between 15-minutes and 60-minutes. Route 905 also operates on Saturday from 5:37 a.m. to 6:37 p.m. with a frequency of 60-minutes. **Appendix F** contains a copy of the current schedule for MTS Route 905.

Pedestrian sidewalks will be provided along Public Street A and Caliente Avenue along the project frontage. A pedestrian connection to the San Ysidro High School and the MTS transit services will be provided along both sides of Caliente Avenue.

As part of the proposed project, dedicated Class II bike lanes will be completed along Caliente Avenue connecting the project to the existing bicycle facilities along Otay Mesa Road.

Parking

The proposed project will provide the minimum required off-street parking spaces for automobiles, motorcycles and bicycles as stated in Sections 142.0510, 142.0525 and 142.0560 of the City of San Diego's Municipal Code, or the applicable Code sections at the time the project is constructed.

In addition, the project is required to provide the minimum required accessible parking spaces per Section 208 of the 2010 ADA Standards for Accessible Design or the City of San Diego's Regulations for Accessible Parking Requirements, Information Bulletin 305 dated June 2010.

9.0 FINDINGS AND CONCLUSIONS

The following summarize the key findings and conclusions of the analysis.

Summary of Findings and Recommendations

Candlelight is a multi-family residential community with 475 dwelling units on a 16-acre site at a density of over 20 dwelling units per acre. Public Street A will be constructed at the southern end of Caliente Avenue as part of the project and will provide access to the site. The proposed project would generate a total of 2,850 new daily trips, including 228 a.m. peak-hour trips, and 257 p.m. peak-hour trips.

The following list summarizes the results of the analyses and recommendations:

Existing Plus Project Conditions:

- Under Existing Plus Project conditions, the project would not have a significant direct traffic impact at any of the intersections, roadway segments and freeway segments analyzed.

Near Term (Year 2014) Plus Project Conditions:

- Under Near Term conditions, the project would have a significant direct traffic impact at the Otay Mesa Road and Caliente Avenue intersection and at the Airway Road and Caliente Avenue intersection. To mitigate the impact at the **Otay Mesa Road and Caliente Avenue intersection**, the project will remove the crosswalk on the south leg of the intersection, add a crosswalk on the west leg of the intersection, and adjust the signal timing to provide additional green time to the westbound left-turn lane. To mitigate the direct traffic related impact at the **Airway Road and Caliente Avenue** intersection, the proposed project would construct a traffic signal at this intersection. It is assumed that the widening of Caliente Avenue as a 5-lane major arterial south of Airway Road, as well as the construction of the east leg of the intersection as a four-lane major arterial will be completed by the Southview project. A tentative map for the Southview project was approved by City Council on September 2012. If roadway widening improvements at the intersection of Caliente Avenue and Airway Road are not completed prior to the installation of the traffic signal, those improvements will be the responsibility of the Candlelight project.

Horizon Year (Year 2035) Plus Project Conditions:

- Under Horizon Year conditions, the project would have significant cumulative traffic impacts at three of the study intersections, one freeway segment and one on-ramp location. To mitigate its impact at the **Otay Mesa Road and Caliente Avenue** intersection, the proposed project will be responsible for its fair-share contribution of **5.23**-percent of installing an overlap phase for the northbound right-turn movement. To mitigate its impact at the **SR-905 WB Ramps and Caliente Avenue** intersection, the project could pay its fair share contribution of **7.65** percent toward the construction of an exclusive southbound right-turn lane and the striping of Caliente Avenue to provide a second southbound right-turn lane and a second northbound left-turn lane. However, these impact are considered unmitigated since there are not currently planned or funded projects to expand the SR-905/Caliente Avenue interchange. To mitigate its impact at the **Caliente Avenue and Public Street A** intersection, the project will install a traffic signal when it becomes warranted. Installing these improvements would improve the operations to better than before project's condition.

- The project was found to have a cumulative impact along **SR-905 between Caliente Avenue and Britannia Boulevard**. These impacts are considered unmitigated since there are not currently planned or funded projects to expand SR-905 by SANDAG or Caltrans in the future to which the project could pay a fair share contribution toward the improvements.

To mitigate the ramp metering impact at the SR-905/Caliente Avenue WB on-ramp under the Horizon Year conditions, the proposed project could pay its fair share contribution of **2.60 percent** to widen the on ramp and provide a second westbound lane. However, these impacts are considered unmitigated since there are not currently planned or funded projects to expand this ramp. The ramp expansion would require a reconfiguration of the SR-905/Caliente Avenue interchange.

Summary of Intersection Analyses

Table 9-1 displays the peak-hour LOS at all the study intersections for the different scenarios analyzed. As shown in the table, the number of intersections operating at LOS E or F under each scenario is listed below in parenthesis:

- Existing Baseline Conditions (0)
- Existing Baseline Plus Project Conditions (0)
- Near Term Baseline (2)
- Near Term Baseline Plus Project (2)
- Horizon Year (Year 2035) Baseline (3)
- Horizon Year Baseline Plus Project (4)

The project will need to mitigate for Near Term and Horizon Year conditions.

Summary of ILV Analyses

The findings of the ILV analysis are presented in **Table 9-2.** As shown in the table, both study intersections that are in the jurisdiction of Caltrans were studied under the Near Term and Horizon Year conditions. As shown in Table 9-2, the number of intersections operating at above capacity under each scenario is listed below in parenthesis:

- Existing Baseline (0)
- Existing Plus Project (0)
- Near Term Baseline (0)
- Near Term Plus Project (0)
- Horizon Year Baseline (1)
- Horizon Year Plus Project (1)

TABLE 9-1

SUMMARY OF PEAK-HOUR INTERSECTION LEVEL OF SERVICE ANALYSIS

	INTERSECTION	PEAK HOUR	EXISTING BASELINE		EXISTING PLUS PROJECT		NEAR TERM BASELINE		NEAR TERM PLUS PROJECT		HORIZON YEAR BASELINE		HORIZON YEAR PLUS PROJECT	
			DELAY (a)	LOS (b)	DELAY (a)	LOS (b)	DELAY (a)	LOS (b)	DELAY (a)	LOS (b)	DELAY (a)	LOS (b)	DELAY (a)	LOS (b)
1	Otay Mesa Rd & Caliente Ave	AM	18.8	B	19.0	B	87.0	**F**	88.1	**F**	101.0	**F**	126.6	**F**
		PM	33.2	C	35.0	D	82.0	**F**	95.3	**F**	153.6	**F**	158.5	**F**
2	SR-905 WB Ramps & Caliente Ave	AM	7.8	A	9.4	A	10.9	B	12.2	B	35.8	D	38.9	D
		PM	13.4	B	15.7	B	15.0	B	17.4	B	154.9	**F**	170.6	**F**
3	SR-905 EB Ramps & Caliente Ave	AM	12.3	B	13.5	B	21.9	C	24.8	C	46.5	D	50.3	D
		PM	12.6	B	13.5	B	30.8	C	35.9	D	40.5	D	43.4	D
4	Airway Rd & Caliente Ave	AM	18.2	C	34.1	D	66.5	**F**	85.7	**F**	622.3	**F**	102.8	F
		PM	21.1	C	29.5	D	65.3	**F**	93.4	**F**	890.0	**F**	87.2	F
5	Public Street A & Caliente Ave	AM	Intersection does not exist under this scenario		11.7	B	Intersection does not exist under this scenario		11.0	B	Intersection does not exist under this scenario		51.2	**F**
		PM			13.0	B			13.0	B			ECL	**F**

Notes:

Bold values indicate intersections operating at LOS E or F. **Bold and shaded** values indicate project significant impact.

ECL = Exceeds Calculable Limit. Reported when delay exceeds 500 seconds.

(a) Delay refers to the average control delay for the entire intersection, measured in seconds per vehicle.

(b) LOS calculations are based on the methodology outlined in the *2000 Highway Capacity Manual* and performed using Synchro 7

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TABLE 9-2

SUMMARY OF PEAK-HOUR ILV RESULTS

	INTERSECTION	PEAK HOUR	EXISTING		EXISTING PLUS PROJECT	
			ILV TOTAL	CAPACITY	ILV TOTAL	CAPACITY
2	Caliente Ave & SR-905 WB Ramps	AM	597	Below Capacity	676	Below Capacity
		PM	1024	Below Capacity	1066	Below Capacity
3	Caliente Ave & SR-905 EB Ramps	AM	567	Below Capacity	630	Below Capacity
		PM	536	Below Capacity	597	Below Capacity
	INTERSECTION	PEAK HOUR	NEAR TERM BASELINE		NEAR TERM PLUS PROJECT	
			ILV TOTAL	CAPACITY	ILV TOTAL	CAPACITY
2	Caliente Ave & SR-905 WB Ramps	AM	788	Below Capacity	867	Below Capacity
		PM	1260	Approaching Capacity	1304	Approaching Capacity
3	Caliente Ave & SR-905 EB Ramps	AM	867	Below Capacity	928	Below Capacity
		PM	980	Below Capacity	1040	Below Capacity
	INTERSECTION	PEAK HOUR	HORIZON YEAR BASELINE		HORIZON YEAR PLUS PROJECT	
			ILV TOTAL	CAPACITY	ILV TOTAL	CAPACITY
2	Caliente Ave & SR-905 WB Ramps	AM	1623	**Above Capacity**	1663	**Above Capacity**
		PM	2658	**Above Capacity**	2729	**Above Capacity**
3	Caliente Ave & SR-905 EB Ramps	AM	1254	Approaching Capacity	1310	Approaching Capacity
		PM	1244	Approaching Capacity	1278	Approaching Capacity

Notes:
Bold values indicate intersections operating above capacity.

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Summary of Roadway Segment Analyses

The findings of roadway segment capacity analysis are presented in **Table 9-3.** As shown in the table, the number of roadway segments operating at LOS E or F under each scenario is listed below in parenthesis:

- Existing Baseline Conditions (0)
- Existing Plus Project Conditions (0)
- Near Term Baseline (0)
- Near Term Baseline Plus Project (0)
- Horizon Year (Year 2035) Baseline (1)
- Horizon Year (Year 2035) Baseline Plus Project (1)

Summary of Freeway Segment Analyses

The findings of freeway segment capacity analysis are presented in **Table 9-4.** As shown in the table, under Existing and Near Term conditions, all the segments of SR-905 would operate at LOS A. Under Horizon Year (Year 2035) scenario, all SR-905 freeway segments would operate at LOS F during at least one peak-hour period. The proposed project is considered having a cumulative traffic related impact along SR-905 between Caliente Avenue and Britannia Boulevard that requires mitigation.

Summary of Freeway Ramp Metering Analysis

The findings of the Freeway Ramp Metering Analysis are presented in **Table 9-5.** As shown in the table, under the Near Term Scenario and the Horizon Year scenario, the demand for the Caliente Avenue to SR-905 westbound on-ramp all ramps are projected to exceed of the meter rate service. This is not considered an impact by the project under the Existing or Near Term conditions since the freeway segments would operate at LOS A, and ramp metering will not be necessary. However, under the Horizon Year (Year 2035) Plus Project conditions, the project would be considered having a cumulative traffic related impact that would need to be mitigated.

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TABLE 9-3

SUMMARY OF ROADWAY SEGMENT LEVEL OF SERVICE ANALYSIS

ROADWAY SEGMENT	ROADWAY CLASSIFICATION	LOS E CAPACITY	EXISTING		EXISTING PLUS PROJECT		NEAR TERM (2014) BASELINE		NEAR TERM (2014) PLUS PROJECT		YEAR 2035 BASELINE		YEAR 2035 PLUS PROJECT	
			ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS
Otay Mesa Road														
Public Street A to Caliente Ave	6 Lane Prime Arterial	60,000	0	A	0	A	3,937	A	3,937	A	22,174	A	22,317	A
Caliente Ave to Heritage Rd	6 Lane Prime Arterial	60,000	13,967	A	14,708	A	18,004	A	18,745	A	50,902	D	51,700	D
Caliente Avenue														
Otay Mesa Rd to SR-905	6 Lane Prime Arterial	60,000	17,562	A	18,474	A	21,241	A	22,153	A	27,051	B	28,220	B
SR-905 to Airway Rd	6 Lane Prime Arterial	60,000	6,403	A	8,883	A	12,155	A	14,635	A	22,565	A	25,073	B
Airway Rd to Public Street A	6 Lane Major Arterial	50,000	4,652	B	7,502	D	8,100	A	10,950	A	19,592	B	22,385	B
Airway Road														
Old Otay Mesa Rd to Caliente Ave	4 Lane Collector	30,000	4,989	A	5,360	A	6,236	A	6,607	A	19,807	**E**	20,092	**E**
Ocean View Hills Parkway														
Otay Mesa Rd to Hidden Trails Rd	6 Lane Major Arterial	50,000	8,500	A	8,671	A	12,911	A	13,082	A	23,347	B	23,575	B

Notes:

Bold values indicate roadway segments operating at LOS E or F. **Bold and shaded** values indicate a project significant impact

(a) The v/c Ratio is calculated by dividing the ADT volume by each respective roadway segment's capacity.

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TABLE 9-4

SUMMARY OF FREEWAY SEGMENT ANALYSIS

FREEWAY SEGMENT	DIRECTION	NUMBER OF LANES	CAPACITY (a)	EXISTING BASELINE		EXISTING WITH PROJECT		NEAR TERM BASELINE		NEAR TERM WITH PROJECT		HORIZON YEAR (YEAR 2035) BASELINE		HORIZON YEAR (YEAR 2035) WITH PROJECT	
				V/C RATIO	LOS	V/C RATIO	LOS	V/C RATIO	LOS	V/C RATIO	LOS	V/C RATIO	LOS	V/C RATIO	LOS
AM PEAK															
SR-905															
I-805 to Caliente Ave	WB	3 M	7050	0.228	A	0.239	A	0.303	A	0.314	A	0.793	C	0.797	C
	EB	3 M	7050	0.298	A	0.301	A	0.397	A	0.399	A	1.189	**F0**	1.190	**F0**
Caliente Ave to Britannia Blvd	WB	3 M	7050	0.178	A	0.178	A	0.216	A	0.217	A	0.700	C	0.703	C
	EB	3 M	7050	0.233	A	0.236	A	0.283	A	0.286	A	1.049	**F0**	1.058	**F0**
PM PEAK															
SR-905															
I-805 to Caliente Ave	WB	3 M	7050	0.318	A	0.322	A	0.423	B	0.427	B	1.191	**F0**	1.193	**F0**
	EB	3 M	7050	0.276	A	0.287	A	0.367	A	0.378	A	0.796	C	0.800	C
Caliente Ave to Britannia Blvd	WB	3 M	7050	0.248	A	0.251	A	0.301	A	0.304	A	1.052	**F0**	1.060	**F0**
	EB	3 M	7050	0.215	A	0.217	A	0.262	A	0.263	A	0.703	C	0.707	C

Notes:

Bold values indicate freeway segments operating at LOS E or F.

(a) The capacity is calculated as 2,350 vehicles per hour per lane (vhpl) for the main lanes, at 1,800 vhpl per auxiliary lanes, and at 1,600 vhpl per truck lanes and HOV lanes

(b) Peak-hour volumes taken from the San Diego - Tijuana Cross Border Facility Project Traffic Impact Study and adjusted to remove the existing land use at the project site.

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TABLE 9-5

PEAK-HOUR RAMP METERING ANALYSIS SUMMARY

ON-RAMP	PEAK PERIOD	NUMBER OF LANES	NEAR TERM METER RATE[1] (veh/hr/ln)	NEAR TERM BASELINE DEMAND[2] (veh/hr)	NEAR TERM AVERAGE BASELINE DELAY (min)	NEAR TERM WITH PROJECT DEMAND[2] (veh/hr)	NEAR TERM AVERAGE WITH PROJECT DELAY (min)	NEAR TERM AVERAGE WITH PROJECT QUEUE	HORIZON YEAR METER RATE[1] (veh/hr/ln)	HORIZON YEAR BASELINE DEMAND[2] (veh/hr)	HORIZON YEAR AVERAGE BASELINE DELAY (min)	HORIZON YEAR WITH PROJECT DEMAND[2] (veh/hr)	HORIZON YEAR AVERAGE WITH PROJECT DELAY (min)	HORIZON YEAR AVERAGE WITH PROJECT QUEUE
Caliente Ave & SR-905 WB Ramp	AM	1	450	747	**39.6**	823	**49.7**	9,325 ft	480	1506	**128.3**	1531	**131.4**	26,275 ft
	PM	1	450	1165	**95.3**	1197	**99.6**	18,675 ft	480	2419	**242.4**	2430	**243.8**	48,750 ft
Caliente Ave & SR-905 EB Ramp	AM	1	450	255	0.0	279	0.0	0 ft	480	280	0.0	340	0.0	0 ft
	PM	1	450	170	0.0	180	0.0	0 ft	480	202	0.0	227	0.0	0 ft

Notes:

1) Meter rate is the assumed peak hour capacity expected to be processed through the ramp meter

2) Demand is the peak hour demand expected to use the on-ramp

K:\SND_TPTO\095809001-Candlelight\Excel\[809001RM01.xls]Summary

Kimley»Horn

June 25, 2015

Suite 600
401 B Street
San Diego, California
92101

Mr. Walter Schwerin
Schwerin and Associates
814 Morena Blvd, Suite 101
San Diego, CA 92110

Re: Sensitivity Analysis for Transportation Unmitigated Impacts

Dear Mr. Schwerin:

A Traffic Impact Study (TIA) was prepared by our firm for your Candlelight project, a multi-family residential community with 475 dwelling units at a density of over 20 dwelling units per acre. The TIA was approved by the City of San Diego in June 2013. The results of The Traffic Impact Study indicate that the proposed project would have the following unmitigated traffic related impacts:

- Horizon Year Cumulative impact along SR-905 freeway between Caliente Avenue and Britannia Boulevard; and
- Horizon Year Cumulative impact at the SR-905/Caliente Avenue WB on-ramp.

This memorandum has been prepared to document an analysis of a reduced project intensity that would not cause an impact to the freeway segment and ramp meter analysis listed above. The study found that a project with 171 dwelling units would not cause an unmitigated traffic related impact.

Traffic Generation

In order to estimate the traffic generation for the 171 dwelling units site, standard City of San Diego traffic generation rates taken from the City of San Diego *Trip Generation Manual* (May 2003) were applied to the proposed project. "Multiple Dwelling Units – Under 20 dwelling units per acre" rates were used to estimate the daily trip rate and morning and afternoon peak-hour traffic generation for this use. **Table 1** summarizes the trip generation for the site. As shown in the table, the site would generate a total of 1,368 new daily trips, including 109 (22 in, 87 out) a.m. peak-hour trips, and 123 (86 in, 37 out) p.m. peak-hour trips.

Trip Distribution

The same traffic distribution assumed in the June 2013 approved traffic study for the project was assumed for the reduced project alternative. **Figure 1** shows the project traffic distribution for the Horizon Year Conditions. **Figure 2** illustrates the project traffic assignment for the Horizon Year Conditions.

Traffic Assignment

Based on the project trip distribution, daily and a.m. and p.m. peak-hour project trips were assigned to the study area. **Figure 2** illustrates the project traffic assignment for the Horizon Year Conditions.

Analysis Results

Table 2 displays the freeway segment analysis under the Horizon Year with and without the reduced project conditions. As shown in the table, both freeway segments in the study area would function at LOS F with and without the addition of the proposed reduced project alternative. Based on the City of San Diego's criteria, the reduced alternative project traffic would not increase the freeway v/c ratio enough to be considered to be a significant cumulative impact.

Table 3 summarizes the ramp metering analysis for the metered freeway ramps under the Horizon Year with and without the project conditions. As shown in the Table and based on the City's criteria, the proposed reduced project alternative would not be considered to have a cumulative traffic related impacts at the ramp meters within the study area.

Please call me if you have any questions or comments.

Sincerely,

KIMLEY-HORN AND ASSOCIATES, INC.

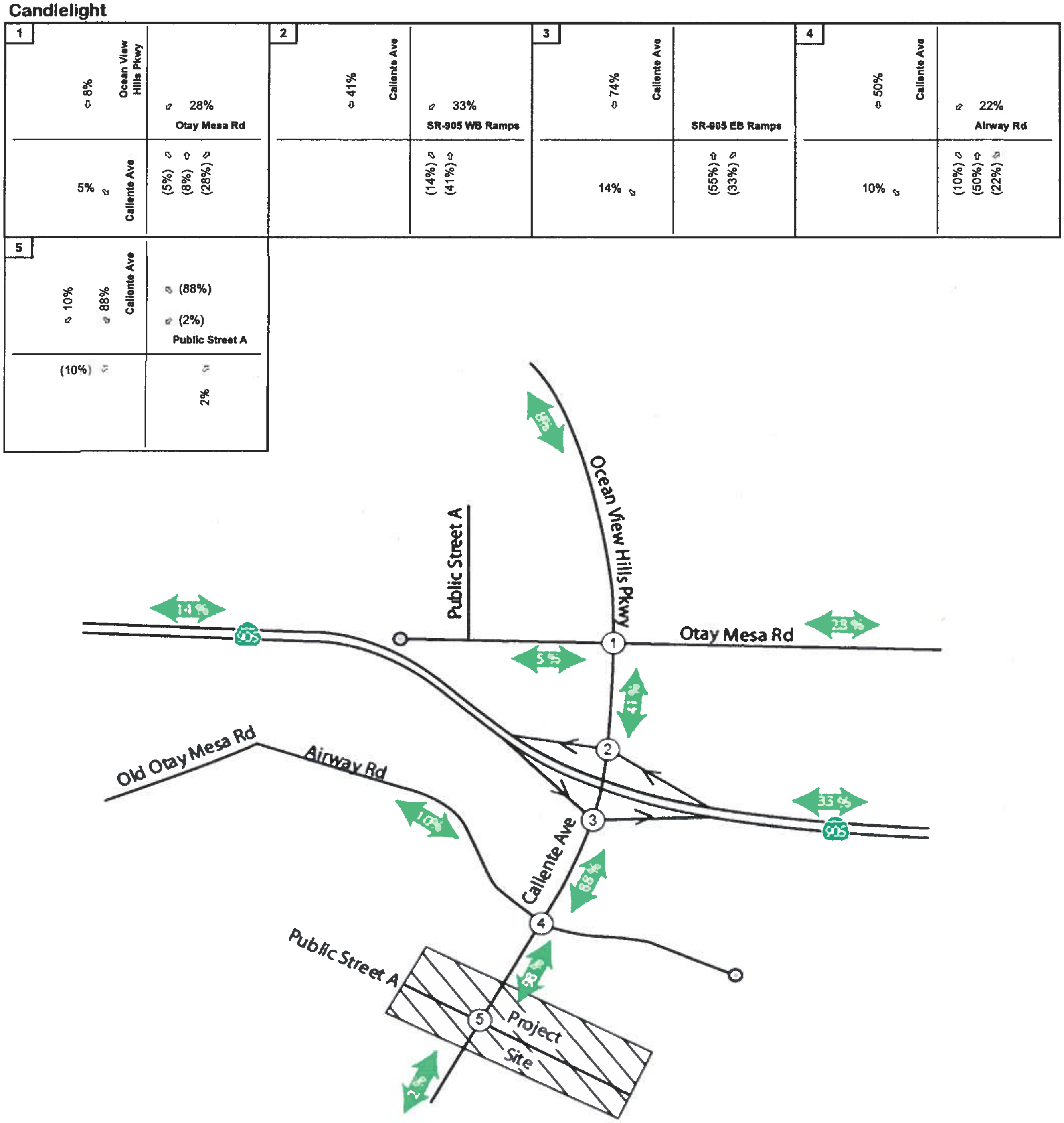
Leo Espelet, P.E.

K:\SND_TPTO\095809001-Candlelight\Report\Candlelight Reduced Project Alternative Memo 06-25-15.doc

Attachment:
Figures 1 and 2, Tables 1 - 3

ATTACHMENTS

Candlelight



Legend

X% / (Y%) = IN / OUT PERCENT DISTRIBUTION

NOT TO SCALE

Kimley-Horn and Associates, Inc.

FIGURE 1

Horizon Year Conditions Project Trip Distribution

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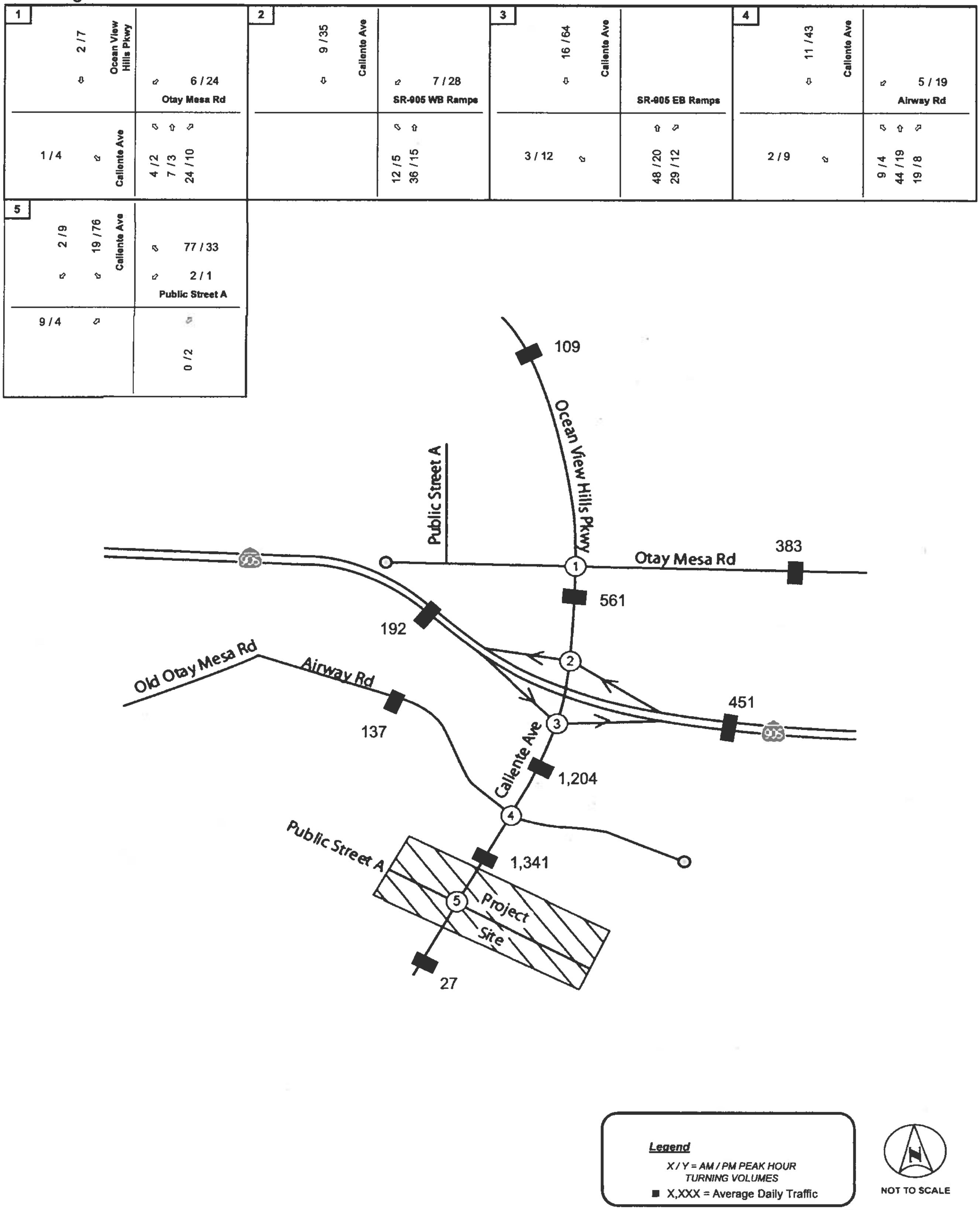
Candlelight



Kimley-Horn and Associates, Inc.

FIGURE 2

Horizon Year Condition Project Trip Assignment

K:\SND_TPTO\095808001-Candlelight\Excel\Sensitivity Analysis\[808001TA01.xlsm]HY Proj Assign Figure 1-16

TABLE 1
TRIP GENERATION SUMMARY

Land Use		Units[1]	Daily Trip Rate[2]	Daily Trips	AM Peak-Hour % of ADT[2]	AM In:Out Ratio[2]	AM In	AM Out	AM Total	PM Peak-Hour % of ADT[2]	PM In:Out Ratio[2]	PM In	PM Out	PM Total
Driveway Trips[3]														
Proposed														
Candlelight	Multiple Dwelling Unit - Over 20 dwelling units/acre	228 du	6 / du	1,368	8%	2.00 : 8.00	22	87	109	9%	7.00 : 3.00	86	37	123
Proposed Total				**1,368**			**22**	**87**	**109**			**86**	**37**	**123**
NET TRIP GENERATION =				**1,368**			**22**	**87**	**109**			**86**	**37**	**123**

Note:
1. DU = Dwelling Unit
2. Trip rates referenced from the City of San Diego Land Development Code - Trip Generation Manual, May 2003.
3. Driveway trips are the total number of trips generated by a site.

K:\SND_TPTO\095809001-Candlelight\Excel\Sensitivity Analysis\[809001TG01.xlsm]Summary

TABLE 2

HORIZON YEAR (YEAR 2035) CONDITIONS

FREEWAY SEGMENT ANALYSIS SUMMARY

				HORIZON YEAR (YEAR 2035) BASELINE						PROJECT PEAK-HOUR VOLUME		HORIZON YEAR (YEAR 2035) WITH PROJECT						V/C RATIO Δ		
				AM PEAK			PM PEAK					AM PEAK			PM PEAK					
FREEWAY SEGMENT	DIRECTION	NUMBER OF LANES	CAPACITY (a)	PEAK-HOUR VOLUME (b)	V/C RATIO	LOS	PEAK-HOUR VOLUME (b)	V/C RATIO	LOS	AM	PM	PEAK-HOUR VOLUME	V/C RATIO	LOS	PEAK-HOUR VOLUME	V/C RATIO	LOS	AM	PM	SIGNIFICANT?
SR-905																				
I-805 to Caliente Ave	WB	3 M	7,050	5,593	0.793	C	8,399	1.191	**F0**	15	6	5,608	0.795	C	8,405	1.192	**F0**	0.00210	0.00089	NO
	EB	3 M	7,050	8,380	1.189	**F0**	5,614	0.796	C	4	15	8,384	1.189	**F0**	5,629	0.798	C	0.00052	0.00207	NO
Caliente Ave to Britannia Blvd	WB	3 M	7,050	4,938	0.700	C	7,416	1.052	**F0**	9	34	4,947	0.702	C	7,450	1.057	**F0**	0.00122	0.00487	**NO**
	EB	3 M	7,050	7,397	1.049	**F0**	4,959	0.703	C	35	15	7,432	1.054	**F0**	4,974	0.706	C	0.00496	0.00211	**NO**

Notes:

Bold values indicate freeway segments operating at LOS E or F.

M= Main lane; A= Auxiliary lane; T=Truck lane

(a) The capacity is calculated as 2,350 vehicles per hour per lane (vhpl) for the main lanes, at 1,800 vhpl per auxiliary lanes, and at 1,600 vhpl per truck lanes and HOV lanes

(b) Peak-hour volumes taken from the San Diego - Tijuana Cross Border Facility Project Traffic Impact Study and adjusted to remove the existing land use at the project site.

#REF!

TABLE 3
HORIZON YEAR CONDITIONS
PEAK-HOUR RAMP METERING ANALYSIS SUMMARY

ON-RAMP	PEAK PERIOD	NUMBER OF LANES (SOV)	METER RATE[1] (veh/hr/ln)	BASELINE DEMAND[2] (veh/hr)	EXCESS BASELINE DEMAND (veh/hr)	AVERAGE BASELINE DELAY (min)	AVERAGE BASELINE QUEUE	WITH PROJECT DEMAND[2] (veh/hr)	EXCESS WITH PROJECT DEMAND (veh/hr)	AVERAGE WITH PROJECT DELAY (min)	FREEWAY LOS	Δ IN DELAY WITH PROJECT (min)	SIGNIFICANT ?	AVERAGE WITH PROJECT QUEUE
Caliente Ave & SR-905 WB Ramp	AM	1	480	1506	1026	128.3	25,650 ft	1518	1038	129.8	C	1.5	NO	25,950 ft
	PM	1	480	2419	1939	242.4	48,475 ft	2424	1944	243.0	**F0**	0.6	NO	48,600 ft
Caliente Ave & SR-905 EB Ramp	AM	1	480	280	0	0.0	0 ft	309	0	0.0	**F0**	0.0	NO	0 ft
	PM	1	480	202	0	0.0	0 ft	214	0	0.0	C	0.0	NO	0 ft

Notes:

1) Meter rates were provided by Caltrans. The meter rates for these locations are based on typical ramp metering operations. It is assumed that 2 vehicles per green will be allowed. The meter rates for a 2 vehicle per green operation ranges from 480 vehicles per hour per lane to 900 vehicles per hour per lane. The meter rate used in the analysis represent average service rate.

2) Demand is the peak hour demand expected to use the on-ramp

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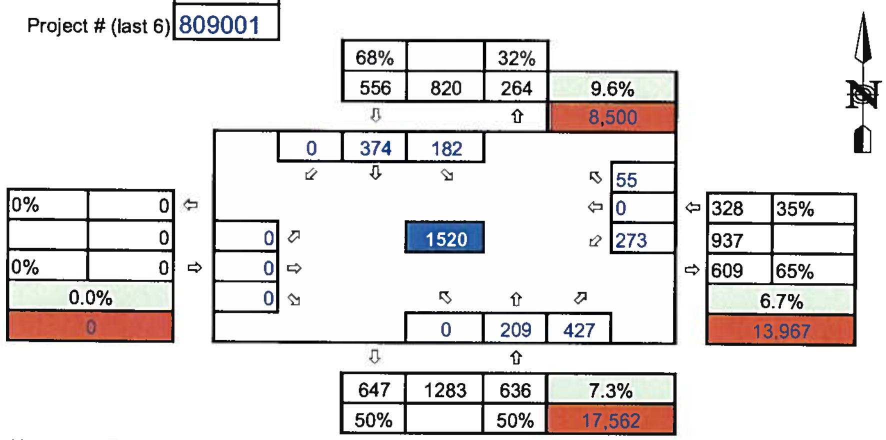
APPENDICES

APPENDIX A

- Forecast Model Plot and Turn Volumes Forecast Worksheets

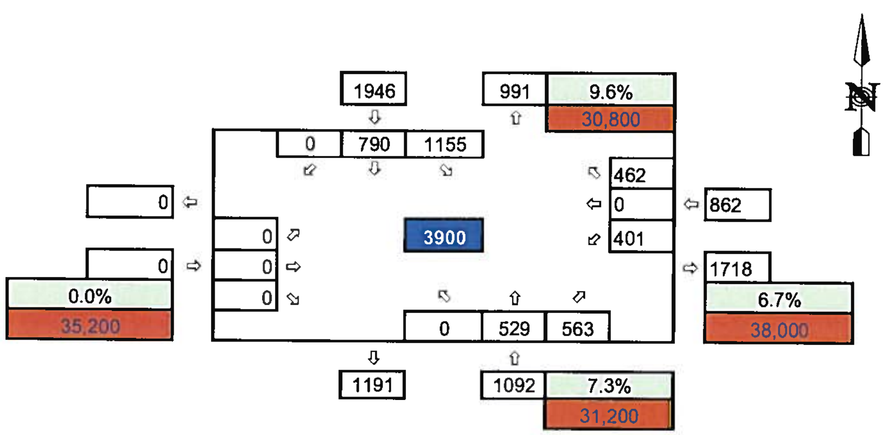
Int 1 AM Peak Volumes

Scenario: **Existing Conditions**
N/S Street: **Ocean View Hills Pkwy / Caliente Ave**
E/W Street: **Otay Mesa Rd**
Intersection #: 1
Project # (last 6) 809001



Note: Traffic volumes were collected by Traffic Data Services Southwest during September 2012.

Scenario: **Horizon Year Conditions**
N/S Street: **Ocean View Hills Pkwy / Caliente Ave**
E/W Street: **Otay Mesa Rd**

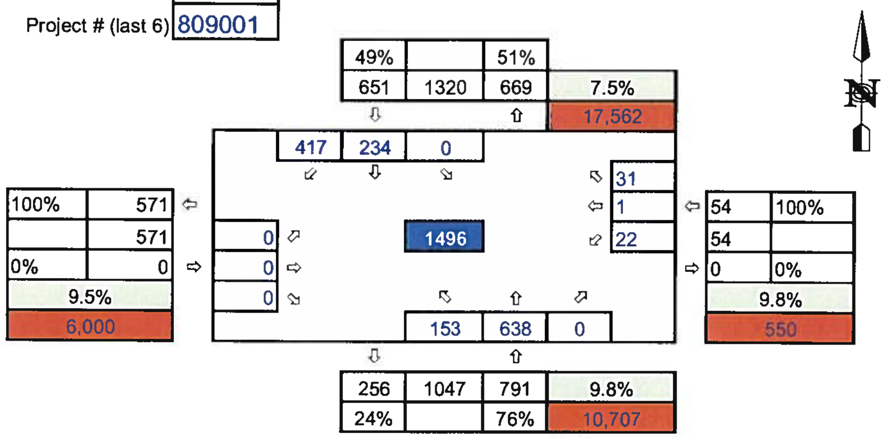


LEGEND

Existing K-Factor	xx%
ADT Volume	xx

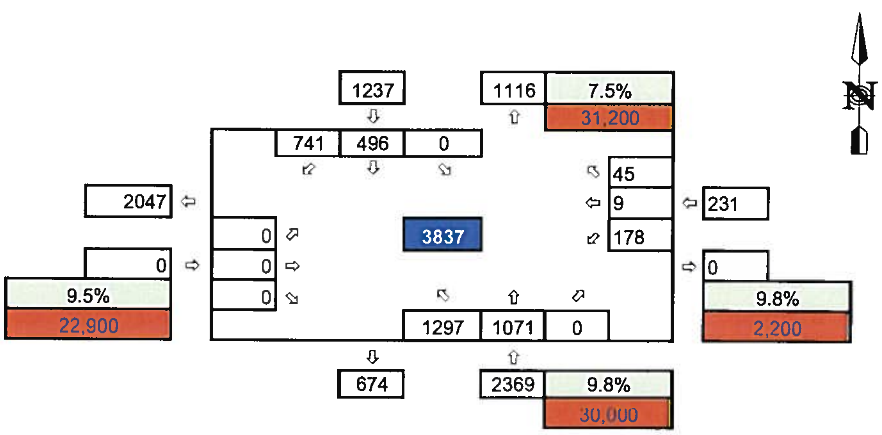
Int 2 AM Peak Volumes

Scenario:	Existing Conditions
N/S Street:	Caliente Ave
E/W Street:	SR-905 WB Ramps
Intersection #:	2
Project # (last 6)	809001



Note: Traffic volumes were collected by Traffic Data Services Southwest during September 2012.

Scenario:	Horizon Year Conditions
N/S Street:	Caliente Ave
E/W Street:	SR-905 WB Ramps

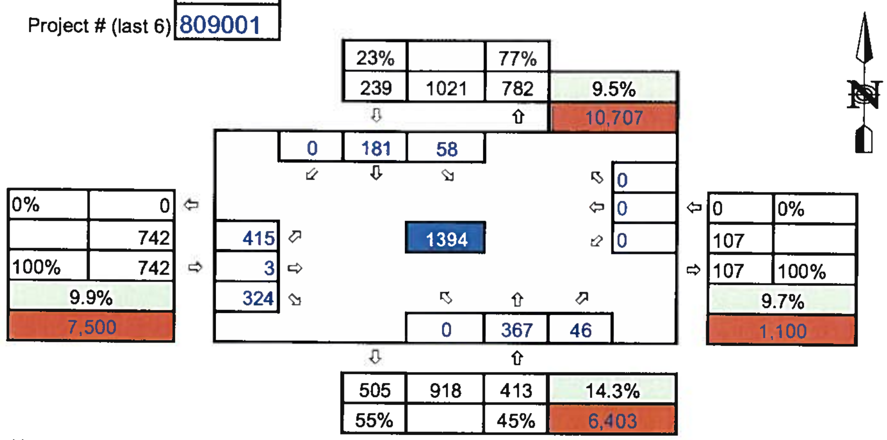


LEGEND

Existing K-Factor	xx%
ADT Volume	xx

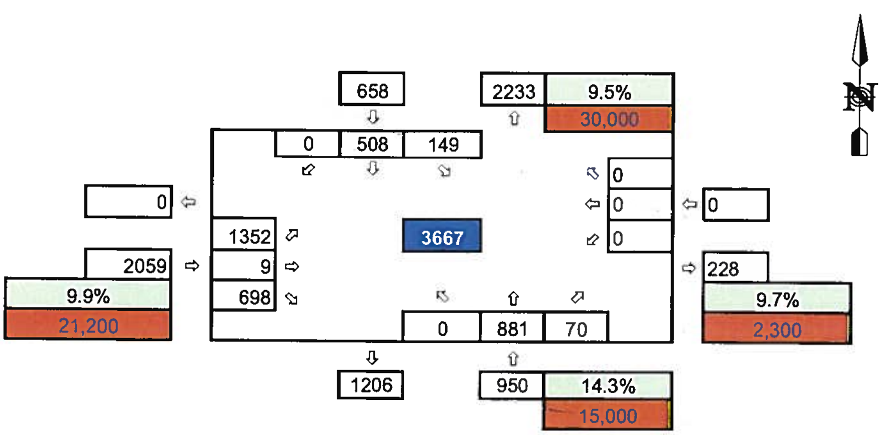
Int 3 AM Peak Volumes

Scenario:	Existing Conditions
N/S Street:	Caliente Ave
E/W Street:	SR-905 EB Ramps
Intersection #:	3
Project # (last 6)	809001



Note: Traffic volumes were collected by Traffic Data Services Southwest during September 2012.

Scenario:	Horizon Year Conditions
N/S Street:	Caliente Ave
E/W Street:	SR-905 EB Ramps



LEGEND

Existing K-Factor	xx%
ADT Volume	xx

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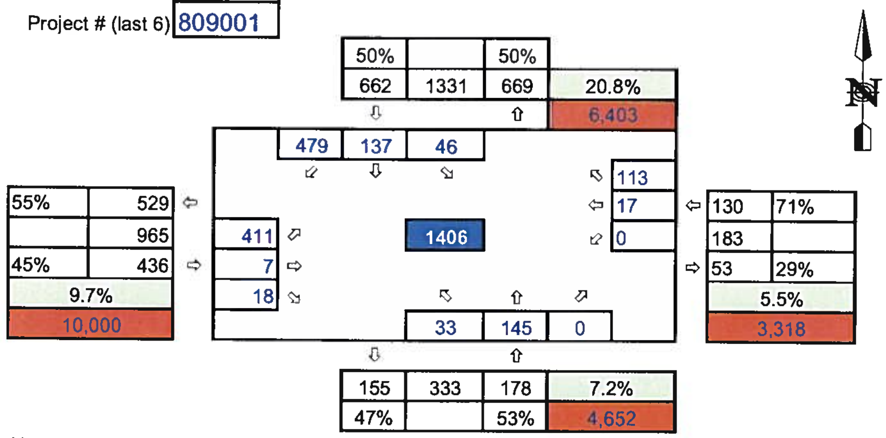
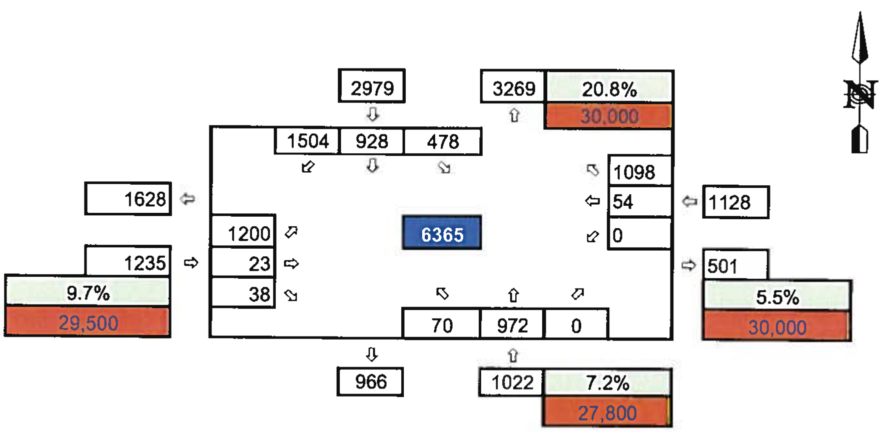
Int 4 AM Peak Volumes

Scenario:	Existing Conditions
N/S Street:	Caliente Ave
E/W Street:	Airway Rd
Intersection #:	4
Project # (last 6)	809001



Note: Traffic volumes were collected by Traffic Data Services Southwest during September 2012.

Scenario:	Horizon Year Conditions
N/S Street:	Caliente Ave
E/W Street:	Airway Rd

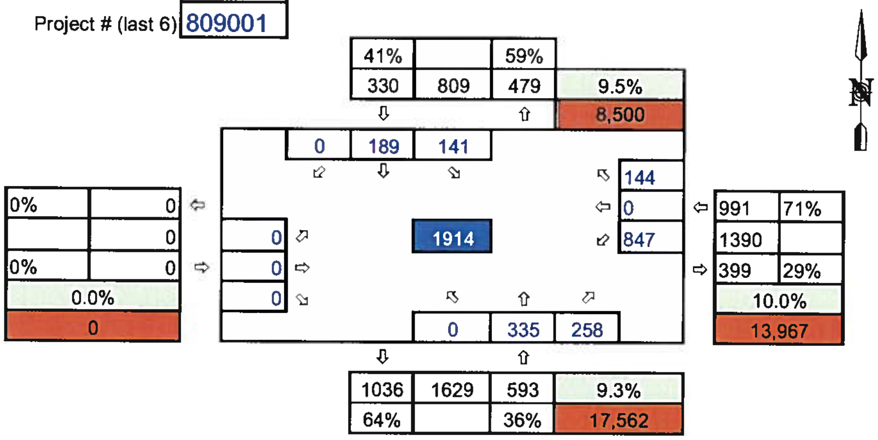


LEGEND

Existing K-Factor	xx%
ADT Volume	xx

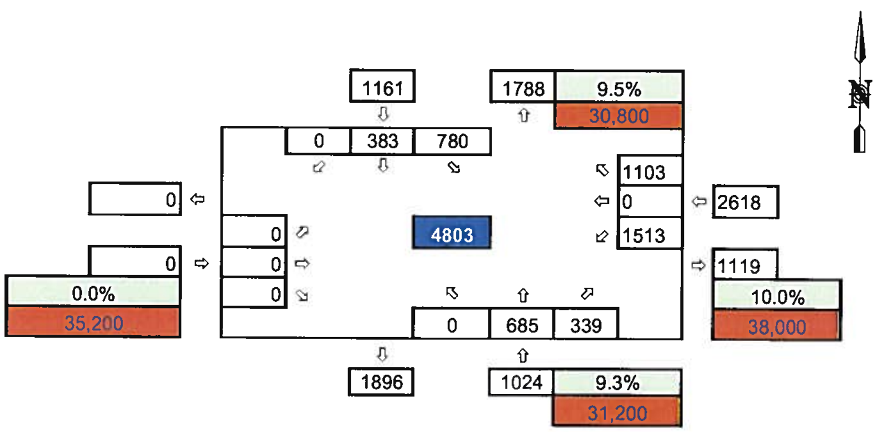
Int 1 PM Peak Volumes

Scenario:	Existing Conditions
N/S Street:	Ocean View Hills Pkwy / Caliente Ave
E/W Street:	Otay Mesa Rd
Intersection #:	1
Project # (last 6)	809001



Note: Traffic volumes were collected by Traffic Data Services Southwest during September 2012.

Scenario:	Horizon Year Conditions
N/S Street:	Ocean View Hills Pkwy / Caliente Ave
E/W Street:	Otay Mesa Rd



LEGEND

Existing K-Factor	xx%
ADT Volume	xx

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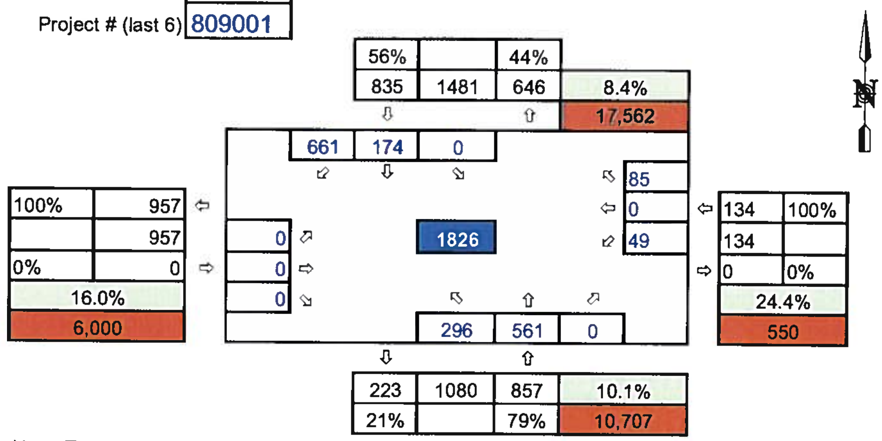
Int 1 PM

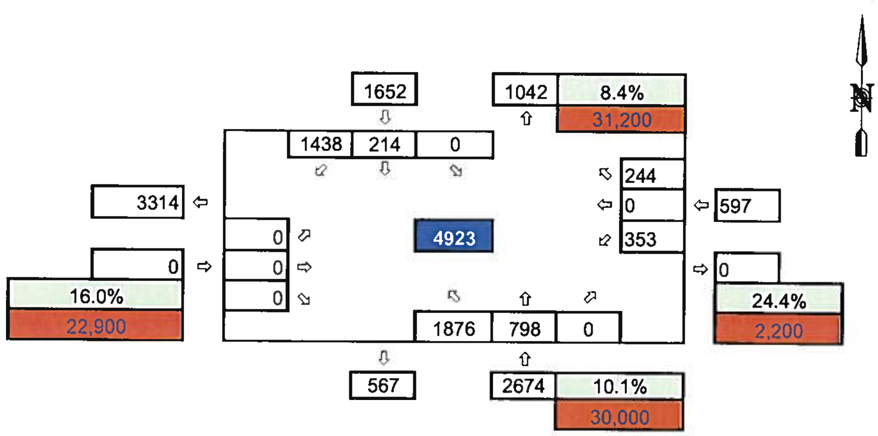
Int 2 PM Peak Volumes

Scenario:	**Existing Conditions**
N/S Street:	**Caliente Ave**
E/W Street:	**SR-905 WB Ramps**
Intersection #:	2
Project # (last 6)	809001



Note: Traffic volumes were collected by Traffic Data Services Southwest during September 2012.

Scenario:	**Horizon Year Conditions**
N/S Street:	**Caliente Ave**
E/W Street:	**SR-905 WB Ramps**



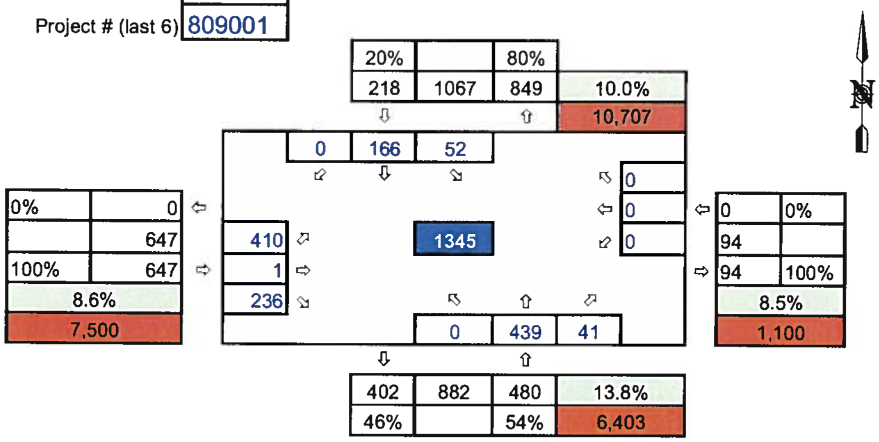
LEGEND

Existing K-Factor	xx%
ADT Volume	xx

K:\SND_TPTO\095809001-Candlelight\Excel\Turn32.xlsx
Int 2 PM

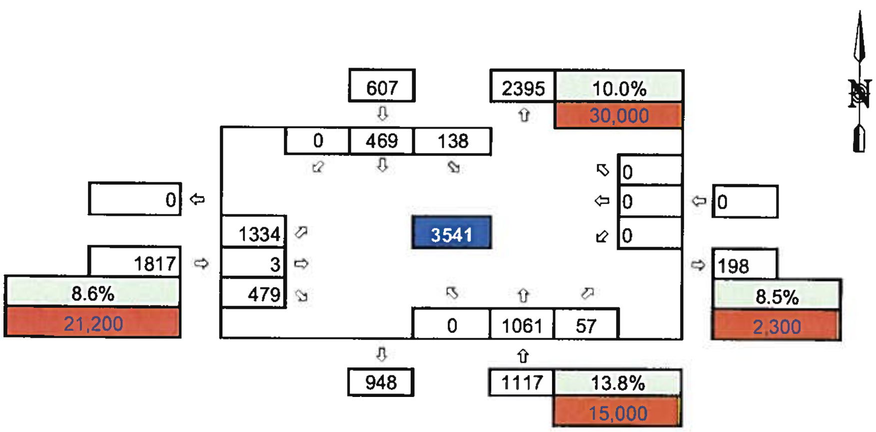
Int 3 PM Peak Volumes

Scenario:	Existing Conditions
N/S Street:	Caliente Ave
E/W Street:	SR-905 EB Ramps
Intersection #:	3
Project # (last 6)	809001



Note: Traffic volumes were collected by Traffic Data Services Southwest during September 2012.

Scenario:	Horizon Year Conditions
N/S Street:	Caliente Ave
E/W Street:	SR-905 EB Ramps

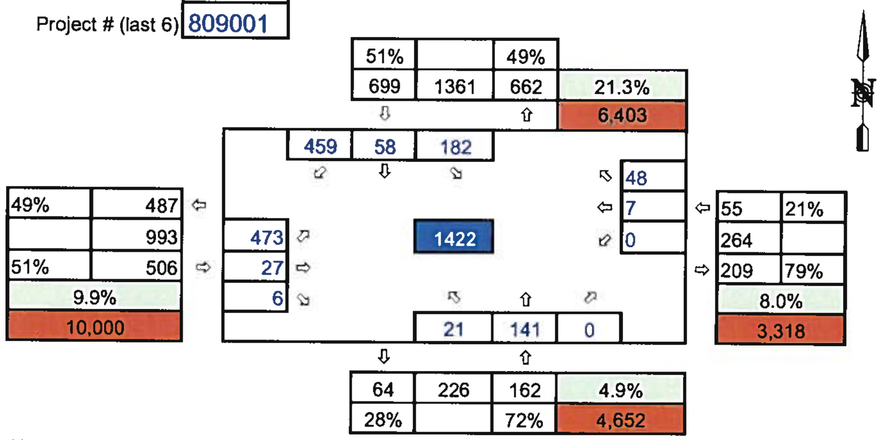


LEGEND

Existing K-Factor	xx%
ADT Volume	xx

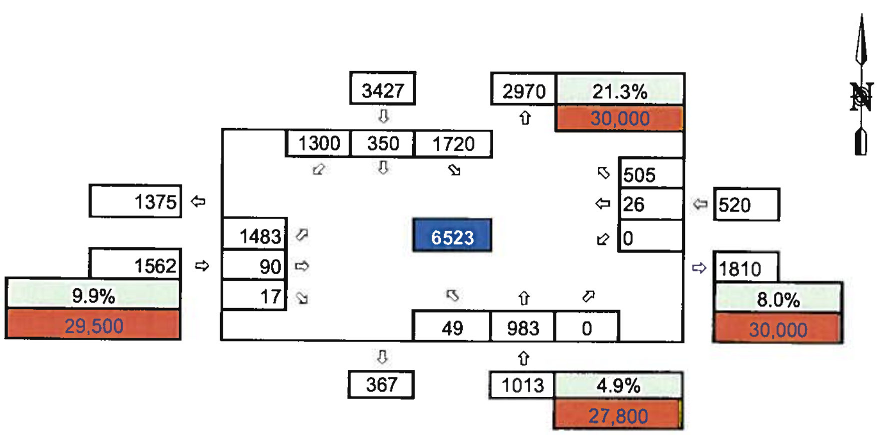
Int 4 PM Peak Volumes

Scenario: **Existing Conditions**
N/S Street: **Caliente Ave**
E/W Street: **Airway Rd**
Intersection #: 4
Project # (last 6): 809001



Note: Traffic volumes were collected by Traffic Data Services Southwest during September 2012.

Scenario: **Horizon Year Conditions**
N/S Street: **Caliente Ave**
E/W Street: **Airway Rd**



LEGEND

Existing K-Factor	xx%
ADT Volume	xx

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Int 4 PM

APPENDIX B

- Existing Traffic Volumes Data

ITM Peak Hour Summary

Prepared by:

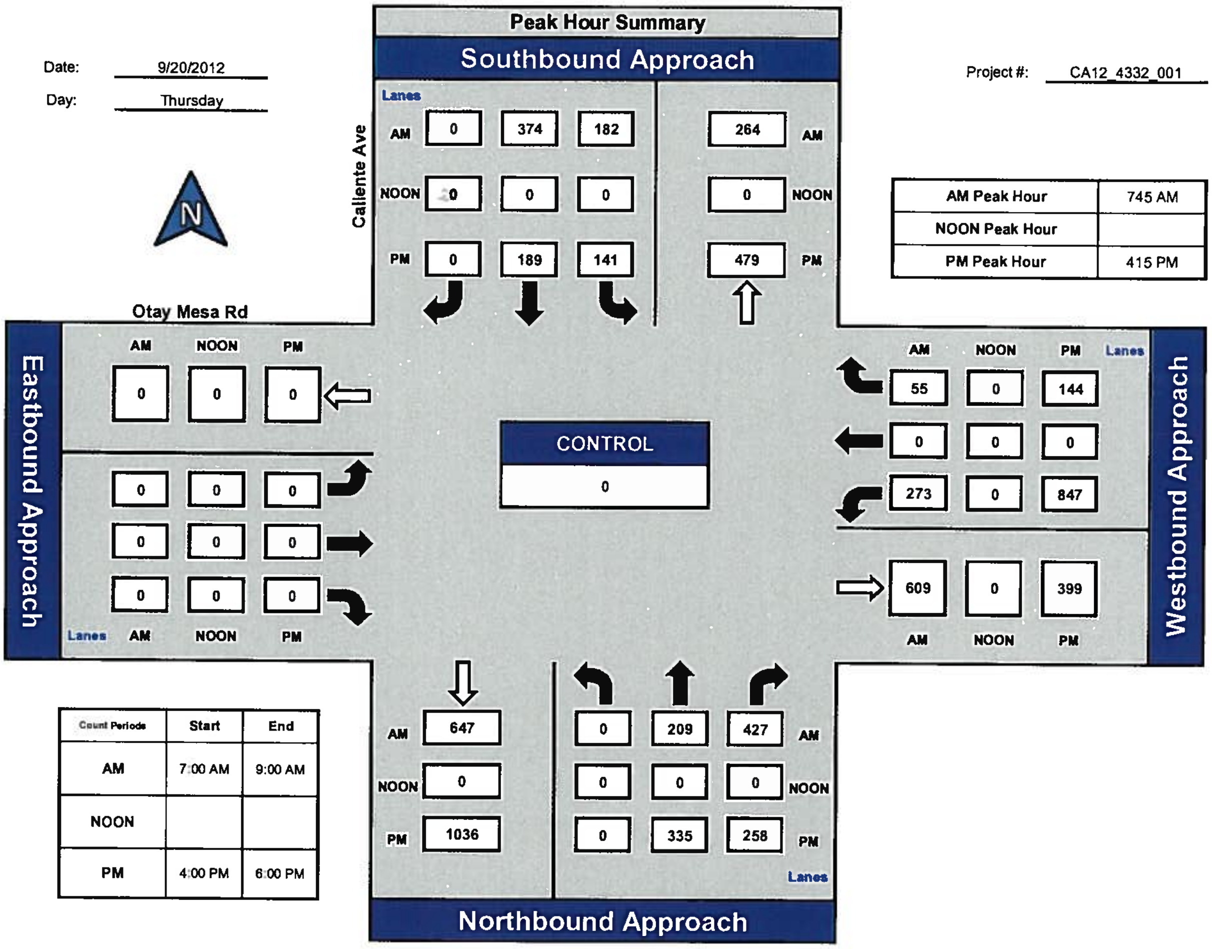
National Data & Surveying Services

Caliente Ave and Otay Mesa Rd , City of Otay Mesa

Date:	9/20/2012
Day:	Thursday

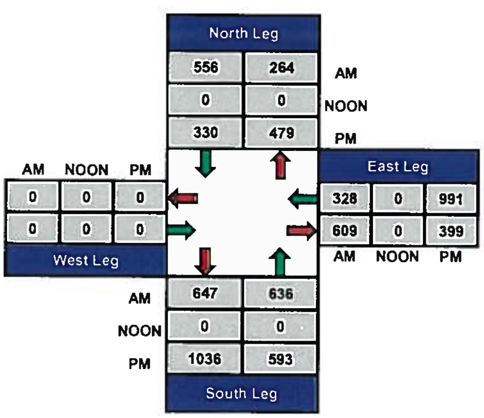
Project #: CA12_4332_001

AM Peak Hour	745 AM
NOON Peak Hour	
PM Peak Hour	415 PM

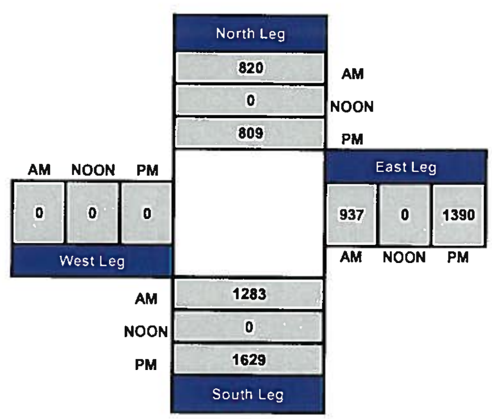


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

NDS

National Data & Surveying Services

Caliente Ave and SR-905 WB Ramps , City of Otay Mesa

Date: 9/20/2012

Day: Thursday

Project #: CA12_4332_002

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	400 PM

Peak Hour Summary

Southbound Approach (Caliente Ave)

Lanes	Right	Through	Left	Out
AM	417	234	0	669
NOON	0	0	0	0
PM	661	174	0	646

Eastbound Approach (SR-905 WB Ramps)

	AM	NOON	PM
Out	571	0	957
Left	0	0	0
Through	0	0	0
Right	0	0	0

Westbound Approach

	AM	NOON	PM
Right	31	0	85
Through	1	0	0
Left	22	0	49
Out	0	0	0

CONTROL

0

Northbound Approach

Lanes	Out	Left	Through	Right
AM	256	153	638	0
NOON	0	0	0	0
PM	223	296	561	0

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

Leg	Period	In	Out
North Leg	AM	651	669
North Leg	NOON	0	0
North Leg	PM	835	646
South Leg	AM	256	791
South Leg	NOON	0	0
South Leg	PM	223	857

Leg		AM	NOON	PM
West Leg		571	0	957
West Leg		0	0	0
East Leg		54	0	134
East Leg		0	0	0

Total Volume Per Leg

Leg	AM	NOON	PM
North Leg	1320	0	1481
West Leg	571	0	957
East Leg	54	0	134
South Leg	1047	0	1080

ITM Peak Hour Summary

Prepared by:

NDS

National Data & Surveying Services

Caliente Ave and SR-905 EB Ramps , City of Otay Mesa

Date: 9/20/2012

Day: Thursday

Project #: CA12_4332_003

N

Peak Hour Summary

AM Peak Hour	800 AM
NOON Peak Hour	
PM Peak Hour	400 PM

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

CONTROL

0

Southbound Approach

Caliente Ave

Lanes

AM	0	181	58	782
NOON	0	0	0	0
PM	0	166	52	849

Eastbound Approach

SR-905 EB Ramps

	AM	NOON	PM
	0	0	0
	415	0	410
	3	0	1
	324	0	236

Lanes

Westbound Approach

	AM	NOON	PM
	0	0	0
	0	0	0
	0	0	0
	107	0	94

Lanes

Northbound Approach

AM	505	0	367	46
NOON	0	0	0	0
PM	402	0	439	41

Lanes

Total Ins & Outs

Leg	Period	In/Out	
North Leg	AM	239	782
North Leg	NOON	0	0
North Leg	PM	218	849
West Leg	AM	0	742
West Leg	NOON	0	0
West Leg	PM	0	647
East Leg	AM	0	107
East Leg	NOON	0	0
East Leg	PM	0	94
South Leg	AM	505	413
South Leg	NOON	0	0
South Leg	PM	402	480

Total Volume Per Leg

Leg	AM	NOON	PM
North Leg	1021	0	1067
West Leg	742	0	647
East Leg	107	0	94
South Leg	918	0	882

ITM Peak Hour Summary

Prepared by:

NDS

National Data & Surveying Services

Caliente Ave and Airway Rd , City of Otay Mesa

Date: 9/20/2012

Day: Thursday

Project #: CA12_4332_004

AM Peak Hour	800 AM
NOON Peak Hour	
PM Peak Hour	400 PM

Peak Hour Summary

N

Caliente Ave

Airway Rd

Southbound Approach

Lanes

AM	368	137	0	382
NOON	0	0	0	0
PM	344	58	0	477

Eastbound Approach

	AM	NOON	PM
	384	0	358
	303	0	364
	0	0	0
	18	0	6

Lanes

Westbound Approach

AM	NOON	PM
0	0	0
0	0	0
0	0	0
0	0	0

Lanes

CONTROL

0

Northbound Approach

AM	155	16	79	0
NOON	0	0	0	0
PM	64	14	113	0

Lanes

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

North Leg

AM	505	382
NOON	0	0
PM	402	477

West Leg

	AM	NOON	PM
	384	0	358
	321	0	370

East Leg

	AM	NOON	PM
	0	0	0
	0	0	0

South Leg

AM	155	95
NOON	0	0
PM	64	127

Total Volume Per Leg

	North Leg	West Leg	East Leg	South Leg
AM	887	705	0	250
NOON	0	0	0	0
PM	879	728	0	191

Prepared by NDS/ATD

Volumes for: Thursday, November 18, 2010	City: San Diego	Daily Totals NB	SB	EB	WB	Total
Location: Otay Mesa Rd from SR-905 to Caliente Ave	Project: 10-4362-001	0	0	34,629	33,410	68,039

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			102		105			12:00			430		546		
00:15			87		105			12:15			501		553		
00:30			71		100			12:30			542		497		
00:45			76	336	73	383	719	12:45			504	1977	506	2102	4079
01:00			112		72			13:00			536		611		
01:15			71		71			13:15			562		508		
01:30			89		85			13:30			628		523		
01:45			83	355	67	295	650	13:45			528	2254	493	2135	4389
02:00			93		64			14:00			538		544		
02:15			89		60			14:15			498		599		
02:30			112		73			14:30			529		632		
02:45			102	396	59	256	652	14:45			553	2118	607	2382	4500
03:00			91		68			15:00			554		663		
03:15			86		105			15:15			501		576		
03:30			107		98			15:30			573		657		
03:45			114	398	84	355	753	15:45			612	2240	659	2555	4795
04:00			83		96			16:00			558		658		
04:15			123		130			16:15			545		687		
04:30			135		155			16:30			510		714		
04:45			143	484	188	569	1053	16:45			508	2121	634	2693	4814
05:00			208		161			17:00			436		664		
05:15			319		199			17:15			466		676		
05:30			439		204			17:30			437		748		
05:45			404	1370	225	789	2159	17:45			419	1758	560	2648	4406
06:00			349		301			18:00			413		522		
06:15			432		368			18:15			363		427		
06:30			568		338			18:30			405		468		
06:45			573	1922	363	1370	3292	18:45			380	1561	366	1783	3344
07:00			502		417			19:00			334		386		
07:15			629		372			19:15			283		323		
07:30			794		385			19:30			253		327		
07:45			791	2716	336	1510	4226	19:45			229	1099	256	1292	2391
08:00			617		349			20:00			212		279		
08:15			665		337			20:15			246		314		
08:30			707		407			20:30			195		272		
08:45			636	2625	465	1558	4183	20:45			203	856	276	1141	1997
09:00			535		428			21:00			225		282		
09:15			580		393			21:15			227		249		
09:30			533		414			21:30			243		235		
09:45			493	2141	469	1704	3845	21:45			207	902	212	978	1880
10:00			454		379			22:00			189		260		
10:15			448		437			22:15			193		213		
10:30			479		435			22:30			196		121		
10:45			493	1874	466	1717	3591	22:45			186	764	110	704	1468
11:00			470		528			23:00			135		114		
11:15			470		465			23:15			129		78		
11:30			469		501			23:30			117		113		
11:45			479	1888	581	2075	3963	23:45			93	474	111	416	890
Total Vol.				16505		12581	**29086**					18124		20829	**38953**

	NB	SB	EB	WB	Total
Daily Totals :	0	0	34,629	33,410	68,039

	AM				PM		
Split %	56.7%	43.3%	**42.7%**		46.5%	53.5%	**57.3%**
AM Peak Hr.	07:30	11:30	**07:30**	**PM Peak Hr.**	15:30	16:45	**15:30**
Volume	2867	2181	**4274**	**Volume**	2288	2722	**4949**
P.H.F.	0.903	0.938	**0.906**	**P.H.F.**	0.935	0.910	**0.973**
7 - 9 Vol.	5341	3068	**8409**	**4 - 6 Vol.**	3879	5341	**9220**
Peak Hr.	07:30	08:00	**07:30**	**Peak Hr.**	16:00	16:45	**16:00**
Volume	2867	1558	**4274**	**Volume**	2121	2722	**4814**
P.H.F.	0.903	0.838	**0.906**	**P.H.F.**	0.950	0.910	**0.977**

Prepared by NDS/ATD

VOLUME

Otay Mesa Rd between Caliente Ave & Corporate Center Dr

Day: Thursday
Date: 9/20/2012

City: Otay Mesa
Project #: CA12_4333_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	5,613	8,354	13,967

AM Period	NB		SB		EB		WB		TOTAL	
00:00					1		5		6	
00:15					6		13		19	
00:30					3		5		8	
00:45					3	13	6	29	9	42
01:00					4		6		10	
01:15					14		7		21	
01:30					1		5		6	
01:45					4	23	4	22	8	45
02:00					2		8		10	
02:15					6		8		14	
02:30					4		5		9	
02:45					7	19	9	30	16	49
03:00					5		11		16	
03:15					8		11		19	
03:30					6		12		18	
03:45					15	34	10	44	25	78
04:00					14		10		24	
04:15					12		14		26	
04:30					14		18		32	
04:45					19	59	13	55	32	114
05:00					23		42		65	
05:15					18		35		53	
05:30					40		33		73	
05:45					54	135	59	169	113	304
06:00					43		44		87	
06:15					71		49		120	
06:30					76		67		143	
06:45					116	306	70	230	186	536
07:00					78		69		147	
07:15					84		80		164	
07:30					104		88		192	
07:45					159	425	74	311	233	736
08:00					154		75		229	
08:15					113		72		185	
08:30					125		88		213	
08:45					112	504	105	340	217	844
09:00					126		105		231	
09:15					91		93		184	
09:30					113		87		200	
09:45					108	438	105	390	213	828
10:00					86		139		225	
10:15					92		107		199	
10:30					111		117		228	
10:45					94	383	140	503	234	886
11:00					100		154		254	
11:15					102		162		264	
11:30					100		153		253	
11:45					80	382	167	636	247	1018
TOTALS						2721		2759		5480
SPLIT %						49.7%		50.3%		39.2%

PM Period	NB		SB		EB		WB		TOTAL	
12:00					107		159		266	
12:15					98		154		252	
12:30					101		131		232	
12:45					115	421	181	625	296	1046
13:00					103		142		245	
13:15					96		178		274	
13:30					102		163		265	
13:45					114	415	167	650	281	1065
14:00					103		162		265	
14:15					127		175		302	
14:30					117		187		304	
14:45					102	449	168	692	270	1141
15:00					100		184		284	
15:15					121		165		286	
15:30					104		214		318	
15:45					90	415	191	754	281	1169
16:00					100		198		298	
16:15					98		198		296	
16:30					90		235		325	
16:45					87	375	213	844	300	1219
17:00					77		287		364	
17:15					85		224		309	
17:30					72		172		244	
17:45					51	285	156	839	207	1124
18:00					47		140		187	
18:15					53		119		172	
18:30					45		100		145	
18:45					39	184	82	441	121	625
19:00					35		71		106	
19:15					32		75		107	
19:30					37		79		116	
19:45					20	124	62	287	82	411
20:00					26		62		88	
20:15					23		46		69	
20:30					19		65		84	
20:45					18	86	39	212	57	298
21:00					17		36		53	
21:15					16		32		48	
21:30					11		23		34	
21:45					19	63	11	102	30	165
22:00					8		30		38	
22:15					18		28		46	
22:30					12		24		36	
22:45					4	42	14	96	18	138
23:00					10		14		24	
23:15					5		11		16	
23:30					14		9		23	
23:45					4	33	19	53	23	86
TOTALS						2892		5595		8487
SPLIT %						34.1%		65.9%		60.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	5,613	8,354	13,967

	NB	SB	EB	WB	Total
AM Peak Hour			07:45	11:15	11:15
AM Pk Volume			551	641	1030
Pk Hr Factor			0.866	0.960	0.968
7 - 9 Volume	0	0	929	651	1580
7 - 9 Peak Hour			07:45	08:00	07:45
7 - 9 Pk Volume	0	0	551	340	860
Pk Hr Factor	0.000	0.000	0.866	0.810	0.923

	NB	SB	EB	WB	Total
PM Peak Hour			13:45	16:30	16:30
PM Pk Volume			461	959	1298
Pk Hr Factor			0.907	0.835	0.891
4 - 6 Volume	0	0	660	1683	2343
4 - 6 Peak Hour			16:00	16:30	16:30
4 - 6 Pk Volume	0	0	375	959	1298
Pk Hr Factor	0.000	0.000	0.938	0.835	0.891

Prepared by NDS/ATD

VOLUME

Caliente Ave between Otay Mesa Rd & SR-905 WB Ramps

Day: Thursday
Date: 9/20/2012

City: Otay Mesa
Project #: CA12_4333_002

DAILY TOTALS	NB	SB	EB	WB	Total
	7,895	9,667	0	0	17,562

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	20		5				25		12:00	145		162				307	
00:15	15		13				28		12:15	134		169				303	
00:30	13		6				19		12:30	113		146				259	
00:45	8	56	5	29			13	85	12:45	125	517	178	655			303	1172
01:00	5		8				13		13:00	119		146				265	
01:15	10		7				17		13:15	109		178				287	
01:30	8		4				12		13:30	131		166				297	
01:45	11	34	6	25			17	59	13:45	140	499	174	664			314	1163
02:00	10		9				19		14:00	142		171				313	
02:15	12		10				22		14:15	161		181				342	
02:30	9		6				15		14:30	149		218				367	
02:45	14	45	12	37			26	82	14:45	124	576	226	796			350	1372
03:00	3		11				14		15:00	140		214				354	
03:15	14		12				26		15:15	176		176				352	
03:30	9		15				24		15:30	136		252				388	
03:45	13	39	12	50			25	89	15:45	159	611	189	831			348	1442
04:00	14		6				20		16:00	174		218				392	
04:15	16		12				28		16:15	185		199				384	
04:30	26		20				46		16:30	153		243				396	
04:45	21	77	20	58			41	135	16:45	160	672	209	869			369	1541
05:00	21		55				76		17:00	128		279				407	
05:15	17		49				66		17:15	156		227				383	
05:30	33		54				87		17:30	130		174				304	
05:45	45	116	76	234			121	350	17:45	106	520	151	831			257	1351
06:00	50		67				117		18:00	103		154				257	
06:15	69		77				146		18:15	106		127				233	
06:30	97		100				197		18:30	104		117				221	
06:45	119	335	101	345			220	680	18:45	69	382	101	499			170	881
07:00	89		109				198		19:00	80		90				170	
07:15	101		123				224		19:15	83		102				185	
07:30	159		139				298		19:30	76		92				168	
07:45	216	565	175	546			391	1111	19:45	52	291	72	356			124	647
08:00	157		173				330		20:00	64		69				133	
08:15	130		138				268		20:15	67		58				125	
08:30	143		130				273		20:30	65		70				135	
08:45	146	576	155	596			301	1172	20:45	47	243	46	243			93	486
09:00	161		154				315		21:00	56		37				93	
09:15	101		105				206		21:15	46		50				96	
09:30	114		103				217		21:30	42		32				74	
09:45	106	482	108	470			214	952	21:45	46	190	18	137			64	327
10:00	97		140				237		22:00	33		23				56	
10:15	95		124				219		22:15	42		36				78	
10:30	124		124				248		22:30	29		37				66	
10:45	110	426	148	536			258	962	22:45	13	117	19	115			32	232
11:00	115		153				268		23:00	25		19				44	
11:15	115		171				286		23:15	17		15				32	
11:30	120		173				293		23:30	21		15				36	
11:45	99	449	179	676			278	1125	23:45	14	77	20	69			34	146
TOTALS		3200		3602				6802	TOTALS		4695		6065				10760
SPLIT %		47.0%		53.0%				38.7%	SPLIT %		43.6%		56.4%				61.3%

DAILY TOTALS	NB	SB	EB	WB	Total
	7,895	9,667	0	0	17,562

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour	07:30	11:15			07:30	PM Peak Hour	16:00	16:30			16:15
AM Pk Volume	662	685			1287	PM Pk Volume	672	958			1556
Pk Hr Factor	0.766	0.957			0.823	Pk Hr Factor	0.908	0.858			0.956
7 - 9 Volume	1141	1142	0	0	2283	4 - 6 Volume	1192	1700	0	0	2892
7 - 9 Peak Hour	07:30	07:30			07:30	4 - 6 Peak Hour	16:00	16:30			16:15
7 - 9 Pk Volume	662	625	0	0	1287	4 - 6 Pk Volume	672	958	0	0	1556
Pk Hr Factor	0.766	0.893	0.000	0.000	0.823	Pk Hr Factor	0.908	0.858	0.000	0.000	0.956

Prepared by NDS/ATD

VOLUME

Caliente Ave between SR-905 WB Ramps & SR-905 EB Ramps

Day: Thursday
Date: 9/20/2012

City: Otay Mesa
Project #: CA12_4333_003

DAILY TOTALS	NB	SB	EB	WB	Total
	8,346	2,361	0	0	10,707

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	10		2				12		12:00	126		37				163	
00:15	11		2				13		12:15	105		33				138	
00:30	11		2				13		12:30	106		25				131	
00:45	6	38	2	8			8	46	12:45	113	450	31	126			144	576
01:00	4		4				8		13:00	115		28				143	
01:15	15		2				17		13:15	107		30				137	
01:30	11		0				11		13:30	119		18				137	
01:45	7	37	2	8			9	45	13:45	133	474	37	113			170	587
02:00	3		1				4		14:00	119		28				147	
02:15	6		3				9		14:15	132		36				168	
02:30	6		0				6		14:30	141		61				202	
02:45	10	25	2	6			12	31	14:45	121	513	69	194			190	707
03:00	9		2				11		15:00	134		53				187	
03:15	12		0				12		15:15	135		37				172	
03:30	7		2				9		15:30	122		47				169	
03:45	14	42	0	4			14	46	15:45	154	545	50	187			204	732
04:00	15		0				15		16:00	243		67				310	
04:15	15		2				17		16:15	241		65				306	
04:30	22		1				23		16:30	199		51				250	
04:45	20	72	2	5			22	77	16:45	147	830	45	228			192	1058
05:00	25		10				35		17:00	148		57				205	
05:15	34		7				41		17:15	150		67				217	
05:30	42		11				53		17:30	125		50				175	
05:45	62	163	11	39			73	202	17:45	119	542	35	209			154	751
06:00	64		7				71		18:00	118		40				158	
06:15	85		14				99		18:15	114		33				147	
06:30	111		15				126		18:30	120		23				143	
06:45	149	409	10	46			159	455	18:45	115	467	28	124			143	591
07:00	99		19				118		19:00	119		31				150	
07:15	126		26				152		19:15	102		21				123	
07:30	181		45				226		19:30	78		22				100	
07:45	234	640	76	166			310	806	19:45	77	376	22	96			99	472
08:00	187		72				259		20:00	71		28				99	
08:15	150		58				208		20:15	77		22				99	
08:30	195		59				254		20:30	65		17				82	
08:45	207	739	68	257			275	996	20:45	50	263	9	76			59	339
09:00	245		56				301		21:00	59		10				69	
09:15	103		17				120		21:15	51		18				69	
09:30	104		28				132		21:30	38		12				50	
09:45	102	554	25	126			127	680	21:45	51	199	8	48			59	247
10:00	96		25				121		22:00	35		9				44	
10:15	92		41				133		22:15	35		10				45	
10:30	111		32				143		22:30	28		10				38	
10:45	95	394	21	119			116	513	22:45	14	112	11	40			25	152
11:00	97		29				126		23:00	19		5				24	
11:15	100		25				125		23:15	21		4				25	
11:30	96		40				136		23:30	19		5				24	
11:45	92	385	25	119			117	504	23:45	18	77	3	17			21	94
TOTALS		3498		903				4401	TOTALS		4848		1458				6306
SPLIT %		79.5%		20.5%				41.1%	SPLIT %		76.9%		23.1%				58.9%

DAILY TOTALS	NB	SB	EB	WB	Total
	8,346	2,361	0	0	10,707

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour	08:15	07:45			08:15	PM Peak Hour	15:45	15:45			15:45
AM Pk Volume	797	265			1038	PM Pk Volume	837	233			1070
Pk Hr Factor	0.813	0.872			0.862	Pk Hr Factor	0.861	0.869			0.863
7 - 9 Volume	1379	423	0	0	1802	4 - 6 Volume	1372	437	0	0	1809
7 - 9 Peak Hour	07:45	07:45			07:45	4 - 6 Peak Hour	16:00	16:00			16:00
7 - 9 Pk Volume	766	265	0	0	1031	4 - 6 Pk Volume	830	228	0	0	1058
Pk Hr Factor	0.818	0.872	0.000	0.000	0.831	Pk Hr Factor	0.854	0.851	0.000	0.000	0.853

Prepared by NDS/ATD

VOLUME

Caliente Ave between SR-905 EB Ramps & Airway Rd

Day: Thursday
Date: 9/20/2012

City: Otay Mesa
Project #: CA12_4333_004

DAILY TOTALS	NB	SB	EB	WB	Total
	3,058	3,345	0	0	6,403

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	2		6				8		12:00	39		39				78	
00:15	1		4				5		12:15	26		36				62	
00:30	1		2				3		12:30	29		23				52	
00:45	1	5	4	16			5	21	12:45	32	126	28	126			60	252
01:00	0		4				4		13:00	29		25				54	
01:15	2		4				6		13:15	23		37				60	
01:30	1		0				1		13:30	54		35				89	
01:45	0	3	1	9			1	12	13:45	45	151	37	134			82	285
02:00	3		5				8		14:00	33		29				62	
02:15	1		2				3		14:15	30		38				68	
02:30	2		0				2		14:30	44		63				107	
02:45	2	8	0	7			2	15	14:45	37	144	63	193			100	337
03:00	2		2				4		15:00	42		59				101	
03:15	1		0				1		15:15	29		46				75	
03:30	2		2				4		15:30	32		63				95	
03:45	5	10	1	5			6	15	15:45	37	140	115	283			152	423
04:00	2		0				2		16:00	163		147				310	
04:15	5		2				7		16:15	163		111				274	
04:30	12		3				15		16:30	97		84				181	
04:45	5	24	3	8			8	32	16:45	52	475	56	398			108	873
05:00	6		3				9		17:00	60		79				139	
05:15	13		3				16		17:15	37		81				118	
05:30	15		8				23		17:30	62		72				134	
05:45	27	61	10	24			37	85	17:45	39	198	49	281			88	479
06:00	28		9				37		18:00	43		64				107	
06:15	37		13				50		18:15	49		45				94	
06:30	46		13				59		18:30	56		48				104	
06:45	41	152	14	49			55	201	18:45	29	177	52	209			81	386
07:00	38		20				58		19:00	41		46				87	
07:15	71		32				103		19:15	39		50				89	
07:30	76		54				130		19:30	30		37				67	
07:45	85	270	78	184			163	454	19:45	22	132	31	164			53	296
08:00	73		91				164		20:00	24		39				63	
08:15	67		94				161		20:15	28		42				70	
08:30	106		130				236		20:30	13		29				42	
08:45	133	379	187	502			320	881	20:45	12	77	16	126			28	203
09:00	169		125				294		21:00	16		16				32	
09:15	28		32				60		21:15	11		27				38	
09:30	24		23				47		21:30	4		15				19	
09:45	23	244	25	205			48	449	21:45	11	42	14	72			25	114
10:00	24		22				46		22:00	4		22				26	
10:15	33		49				82		22:15	7		16				23	
10:30	18		34				52		22:30	6		19				25	
10:45	28	103	17	122			45	225	22:45	5	22	15	72			20	94
11:00	28		30				58		23:00	8		14				22	
11:15	24		33				57		23:15	4		9				13	
11:30	25		29				54		23:30	2		9				11	
11:45	23	100	25	117			48	217	23:45	1	15	7	39			8	54
TOTALS		1359		1248				**2607**	**TOTALS**		1699		2097				**3796**
SPLIT %		52.1%		47.9%				**40.7%**	**SPLIT %**		44.8%		55.2%				**59.3%**

DAILY TOTALS	NB	SB	EB	WB	Total
	3,058	3,345	0	0	6,403

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour	08:15	08:15			**08:15**	**PM Peak Hour**	16:00	15:45			**15:45**
AM Pk Volume	475	536			**1011**	**PM Pk Volume**	475	457			**917**
Pk Hr Factor	0.703	0.717			**0.790**	**Pk Hr Factor**	0.729	0.777			**0.740**
7 - 9 Volume	649	686	0	0	**1335**	**4 - 6 Volume**	673	679	0	0	**1352**
7 - 9 Peak Hour	08:00	08:00			**08:00**	**4 - 6 Peak Hour**	16:00	16:00			**16:00**
7 - 9 Pk Volume	379	502	0	0	**881**	**4 - 6 Pk Volume**	475	398	0	0	**873**
Pk Hr Factor	0.712	0.671	0.000	0.000	**0.688**	**Pk Hr Factor**	0.729	0.677	0.000	0.000	**0.704**

Prepared by NDS/ATD

VOLUME

Airway Rd between Old Otay Mesa Rd & Caliente Ave

Day: Thursday
Date: 9/20/2012

City: Otay Mesa
Project #: CA12_4333_005

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	2,461	2,191	4,652

AM Period	NB	SB	EB		WB		TOTAL	
00:00			7		2		9	
00:15			3		1		4	
00:30			3		1		4	
00:45			3	16	0	4	3	20
01:00			4		0		4	
01:15			4		2		6	
01:30			1		1		2	
01:45			1	10	0	3	1	13
02:00			5		3		8	
02:15			2		1		3	
02:30			0		1		1	
02:45			0	7	2	7	2	14
03:00			2		2		4	
03:15			0		1		1	
03:30			2		2		4	
03:45			1	5	5	10	6	15
04:00			0		2		2	
04:15			2		5		7	
04:30			2		11		13	
04:45			3	7	5	23	8	30
05:00			3		6		9	
05:15			3		14		17	
05:30			6		17		23	
05:45			6	18	23	60	29	78
06:00			6		27		33	
06:15			9		36		45	
06:30			9		43		52	
06:45			14	38	40	146	54	184
07:00			16		34		50	
07:15			15		71		86	
07:30			31		68		99	
07:45			50	112	87	260	137	372
08:00			46		51		97	
08:15			34		44		78	
08:30			46		65		111	
08:45			74	200	92	252	166	452
09:00			75		93		168	
09:15			31		23		54	
09:30			23		19		42	
09:45			17	146	20	155	37	301
10:00			18		24		42	
10:15			38		18		56	
10:30			28		15		43	
10:45			17	101	26	83	43	184
11:00			32		23		55	
11:15			29		21		50	
11:30			23		21		44	
11:45			26	110	21	86	47	196
TOTALS				770		1089		1859
SPLIT %				41.4%		58.6%		40.0%

PM Period	NB	SB	EB		WB		TOTAL	
12:00			29		23		52	
12:15			28		26		54	
12:30			22		20		42	
12:45			23	102	30	99	53	201
13:00			21		24		45	
13:15			25		25		50	
13:30			16		33		49	
13:45			27	89	33	115	60	204
14:00			23		24		47	
14:15			31		27		58	
14:30			43		26		69	
14:45			62	159	18	95	80	254
15:00			46		32		78	
15:15			30		25		55	
15:30			37		32		69	
15:45			50	163	52	141	102	304
16:00			113		70		183	
16:15			103		55		158	
16:30			56		49		105	
16:45			48	320	37	211	85	531
17:00			65		35		100	
17:15			63		26		89	
17:30			56		25		81	
17:45			45	229	29	115	74	344
18:00			43		31		74	
18:15			49		22		71	
18:30			36		26		62	
18:45			46	174	24	103	70	277
19:00			41		33		74	
19:15			54		23		77	
19:30			35		19		54	
19:45			25	155	21	96	46	251
20:00			36		15		51	
20:15			42		17		59	
20:30			27		11		38	
20:45			15	120	11	54	26	174
21:00			17		17		34	
21:15			26		11		37	
21:30			16		3		19	
21:45			16	75	9	40	25	115
22:00			20		6		26	
22:15			16		4		20	
22:30			15		6		21	
22:45			17	68	6	22	23	90
23:00			12		5		17	
23:15			10		5		15	
23:30			8		0		8	
23:45			7	37	1	11	8	48
TOTALS				1691		1102		2793
SPLIT %				60.5%		39.5%		60.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	2,461	2,191	4,652

	EB	WB	Total		EB	WB	Total
AM Peak Hour	08:15	08:15	08:15	PM Peak Hour	15:45	15:45	15:45
AM Pk Volume	229	294	523	PM Pk Volume	322	226	548
Pk Hr Factor	0.763	0.790	0.778	Pk Hr Factor	0.712	0.807	0.749
7 - 9 Volume	312	512	824	4 - 6 Volume	549	326	875
7 - 9 Peak Hour	08:00	07:15	08:00	4 - 6 Peak Hour	16:00	16:00	16:00
7 - 9 Pk Volume	200	277	452	4 - 6 Pk Volume	320	211	531
Pk Hr Factor	0.676	0.796	0.681	Pk Hr Factor	0.708	0.754	0.725

Prepared by NDS/ATD

Volumes for: Thursday, November 18, 2010	City: San Diego		Daily Totals				
		NB	SB	EB	WB	Total
Location: Airway Rd W/o Caliente Ave	Project: 10-4362-006	0	0	2,393	2,596	4,989

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			0		8			12:00			16		25		
00:15			4		6			12:15			23		29		
00:30			0		7			12:30			28		19		
00:45			0	4	2	23	27	12:45			29	96	27	100	196
01:00			0		4			13:00			38		24		
01:15			1		3			13:15			32		35		
01:30			3		1			13:30			23		40		
01:45			0	4	0	8	12	13:45			23	116	33	132	248
02:00			2		0			14:00			23		41		
02:15			1		3			14:15			25		35		
02:30			1		2			14:30			27		29		
02:45			0	4	0	5	9	14:45			23	98	30	135	233
03:00			2		0			15:00			41		42		
03:15			1		0			15:15			31		42		
03:30			1		0			15:30			30		51		
03:45			2	6	1	1	7	15:45			33	135	76	211	346
04:00			4		6			16:00			104		103		
04:15			4		0			16:15			57		67		
04:30			6		5			16:30			40		62		
04:45			7	21	0	11	32	16:45			35	236	78	310	546
05:00			7		3			17:00			52		74		
05:15			9		0			17:15			49		81		
05:30			22		5			17:30			63		106		
05:45			12	50	1	9	59	17:45			60	224	74	335	559
06:00			29		3			18:00			33		52		
06:15			30		16			18:15			24		44		
06:30			52		14			18:30			33		48		
06:45			34	145	19	52	197	18:45			20	110	45	189	299
07:00			41		21			19:00			15		41		
07:15			62		23			19:15			17		29		
07:30			75		39			19:30			17		30		
07:45			100	278	67	150	428	19:45			19	68	31	131	199
08:00			64		59			20:00			11		26		
08:15			65		54			20:15			13		19		
08:30			136		72			20:30			13		24		
08:45			123	388	75	260	648	20:45			18	55	24	93	148
09:00			37		30			21:00			10		27		
09:15			28		19			21:15			14		28		
09:30			15		21			21:30			12		29		
09:45			27	107	18	88	195	21:45			5	41	13	97	138
10:00			16		14			22:00			6		15		
10:15			19		31			22:15			4		18		
10:30			19		9			22:30			4		5		
10:45			27	81	33	87	168	22:45			6	20	10	48	68
11:00			26		28			23:00			9		6		
11:15			28		19			23:15			3		8		
11:30			23		19			23:30			1		7		
11:45			16	93	29	95	188	23:45			0	13	5	26	39
Total Vol.				1181		789	**1970**					1212		1807	**3019**

	NB	SB	EB	WB	Total
Daily Totals :	0	0	2,393	2,596	4,989

	AM				PM		
Split %	59.9%	40.1%	**39.5%**		40.1%	59.9%	**60.5%**
AM Peak Hr.	08:00	08:00	**08:00**	**PM Peak Hr.**	16:00	16:45	**17:00**
Volume	388	260	**648**	**Volume**	236	339	**559**
P.H.F.	0.713	0.867	**0.779**	**P.H.F.**	0.567	0.800	**0.827**
7 - 9 Vol.	666	410	**1076**	**4 - 6 Vol.**	460	645	**1105**
Peak Hr.	08:00	08:00	**08:00**	**Peak Hr.**	16:00	16:45	**17:00**
Volume	388	260	**648**	**Volume**	236	339	**559**
P.H.F.	0.713	0.867	**0.779**	**P.H.F.**	0.567	0.800	**0.827**

APPENDIX C

- Peak-Hour Intersection Level of Service Worksheets

1: Otay Mesa Rd & Caliente Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	273	0	55	0	209	427	182	374	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.2		5.2		5.6	5.6	5.2	5.6	
Lane Util. Factor				0.97		1.00		0.95	1.00	0.97	0.95	
Frt				1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected				0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)				3433		1583		3539	1583	3433	3539	
Flt Permitted				0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)				3433		1583		3539	1583	3433	3539	
Peak-hour factor, PHF	0.25	0.25	0.25	0.85	0.85	0.85	0.75	0.75	0.75	0.76	0.76	0.76
Adj. Flow (vph)	0	0	0	321	0	65	0	279	569	239	492	0
RTOR Reduction (vph)	0	0	0	0	0	51	0	0	246	0	0	0
Lane Group Flow (vph)	0	0	0	321	0	14	0	279	323	239	492	0
Turn Type				Prot		custom			Perm	Prot		
Protected Phases				1		7		8		7	4	
Permitted Phases						6			8			
Actuated Green, G (s)				12.9		18.2		47.0	47.0	6.8	59.0	
Effective Green, g (s)				12.9		18.2		47.0	47.0	6.8	59.0	
Actuated g/C Ratio				0.16		0.22		0.57	0.57	0.08	0.71	
Clearance Time (s)				5.2		5.2		5.6	5.6	5.2	5.6	
Vehicle Extension (s)				3.0		3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				535		348		2011	900	282	2525	
v/s Ratio Prot				c0.09		0.00		0.08		c0.07	0.14	
v/s Ratio Perm						0.01			c0.20			
v/c Ratio				0.60		0.04		0.14	0.36	0.85	0.19	
Uniform Delay, d1				32.5		25.4		8.4	9.7	37.4	3.9	
Progression Factor				1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2				1.8		0.0		0.1	1.1	20.4	0.0	
Delay (s)				34.3		25.4		8.5	10.8	57.8	4.0	
Level of Service				C		C		A	B	E	A	
Approach Delay (s)		0.0			32.8			10.0			21.6	
Approach LOS		A			C			B			C	

Intersection Summary			
HCM Average Control Delay	18.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	82.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	40.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

2: SR-905 WB Ramps & Caliente Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	22	1	31	153	638	0	0	234	417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6	4.6	4.2	4.6			4.6	
Lane Util. Factor					1.00	1.00	1.00	0.91			0.91	
Frt					1.00	0.85	1.00	1.00			0.90	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1777	1583	1770	5085			4597	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1777	1583	1770	5085			4597	
Peak-hour factor, PHF	0.25	0.25	0.25	0.79	0.79	0.79	0.84	0.84	0.84	0.83	0.83	0.83
Adj. Flow (vph)	0	0	0	28	1	39	182	760	0	0	282	502
RTOR Reduction (vph)	0	0	0	0	0	36	0	0	0	0	231	0
Lane Group Flow (vph)	0	0	0	0	29	3	182	760	0	0	553	0
Turn Type				Perm		Perm	Prot					
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					4.2	4.2	11.1	49.0			33.7	
Effective Green, g (s)					4.2	4.2	11.1	49.0			33.7	
Actuated g/C Ratio					0.07	0.07	0.18	0.79			0.54	
Clearance Time (s)					4.6	4.6	4.2	4.6			4.6	
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)					120	107	315	3993			2483	
v/s Ratio Prot							c0.10	0.15			c0.12	
v/s Ratio Perm					0.02	0.00						
v/c Ratio					0.24	0.02	0.58	0.19			0.22	
Uniform Delay, d1					27.6	27.2	23.5	1.7			7.5	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					1.0	0.1	2.6	0.1			0.2	
Delay (s)					28.6	27.3	26.1	1.8			7.7	
Level of Service					C	C	C	A			A	
Approach Delay (s)		0.0			27.9			6.5			7.7	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM Average Control Delay	7.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	62.4	Sum of lost time (s)	13.4
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Candlelight
3: SR-905 EB Ramps & Caliente Ave

Existing Baseline
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	415	3	324	0	0	0	0	367	46	58	181	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1						4.1		3.7	4.1	
Lane Util. Factor	0.95	0.95						0.91		1.00	0.95	
Frt	1.00	0.87						0.98		1.00	1.00	
Flt Protected	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (prot)	1681	1528						5000		1770	3539	
Flt Permitted	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (perm)	1681	1528						5000		1770	3539	
Peak-hour factor, PHF	0.84	0.84	0.84	0.25	0.25	0.25	0.77	0.77	0.77	0.83	0.83	0.83
Adj. Flow (vph)	494	4	386	0	0	0	0	477	60	70	218	0
RTOR Reduction (vph)	0	225	0	0	0	0	0	25	0	0	0	0
Lane Group Flow (vph)	445	214	0	0	0	0	0	512	0	70	218	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	18.8	18.8						11.2		3.1	18.0	
Effective Green, g (s)	18.8	18.8						11.2		3.1	18.0	
Actuated g/C Ratio	0.42	0.42						0.25		0.07	0.40	
Clearance Time (s)	4.1	4.1						4.1		3.7	4.1	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	702	638						1244		122	1416	
v/s Ratio Prot	c0.26	0.14						c0.10		c0.04	0.06	
v/s Ratio Perm												
v/c Ratio	0.63	0.34						0.41		0.57	0.15	
Uniform Delay, d1	10.4	8.9						14.1		20.3	8.6	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	1.9	0.3						0.2		6.4	0.1	
Delay (s)	12.3	9.2						14.4		26.7	8.7	
Level of Service	B	A						B		C	A	
Approach Delay (s)		10.7			0.0			14.4			13.1	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM Average Control Delay	12.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Candlelight
4: Airway Rd & Caliente Ave

Existing Baseline
Timing Plan: AM PEAK

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	303	18	16	79	137	368
Peak Hour Factor	0.74	0.74	0.58	0.58	0.72	0.72
Hourly flow rate (vph)	409	24	28	136	190	511

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total (vph)	273	161	164	190	511
Volume Left (vph)	273	136	28	0	0
Volume Right (vph)	0	24	0	0	511
Hadj (s)	0.53	0.35	0.07	0.03	-0.67
Departure Headway (s)	7.2	7.0	6.7	6.3	5.6
Degree Utilization, x	0.55	0.31	0.30	0.33	0.79
Capacity (veh/h)	473	490	516	556	632
Control Delay (s)	17.4	12.0	12.5	11.2	25.0
Approach Delay (s)	15.4		12.5	21.3	
Approach LOS	C		B	C	

Intersection Summary			
Delay	18.2		
HCM Level of Service	C		
Intersection Capacity Utilization	34.5%	ICU Level of Service	A
Analysis Period (min)	15		

Candlelight
1: Otay Mesa Rd & Caliente Ave

Existing Baseline
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	847	0	144	0	335	258	141	189	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.2		5.2		5.6	5.6	5.2	5.6	
Lane Util. Factor				0.97		1.00		0.95	1.00	0.97	0.95	
Frt				1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected				0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)				3433		1583		3539	1583	3433	3539	
Flt Permitted				0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)				3433		1583		3539	1583	3433	3539	
Peak-hour factor, PHF	0.25	0.25	0.25	0.73	0.73	0.73	0.84	0.84	0.84	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	1160	0	197	0	399	307	155	208	0
RTOR Reduction (vph)	0	0	0	0	0	114	0	0	178	0	0	0
Lane Group Flow (vph)	0	0	0	1160	0	83	0	399	129	155	208	0
Turn Type				Prot		custom			Perm	Prot		
Protected Phases				1		7		8		7	4	
Permitted Phases						6			8			
Actuated Green, G (s)				41.8		47.1		47.1	47.1	6.8	59.1	
Effective Green, g (s)				41.8		47.1		47.1	47.1	6.8	59.1	
Actuated g/C Ratio				0.37		0.42		0.42	0.42	0.06	0.53	
Clearance Time (s)				5.2		5.2		5.6	5.6	5.2	5.6	
Vehicle Extension (s)				3.0		3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				1285		667		1492	667	209	1872	
v/s Ratio Prot				c0.34		0.01		c0.11		c0.05	0.06	
v/s Ratio Perm						0.04			0.08			
v/c Ratio				0.90		0.12		0.27	0.19	0.74	0.11	
Uniform Delay, d1				33.0		19.7		21.1	20.3	51.6	13.2	
Progression Factor				1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2				9.0		0.1		0.4	0.6	13.2	0.0	
Delay (s)				42.1		19.8		21.5	21.0	64.8	13.2	
Level of Service				D		B		C	C	E	B	
Approach Delay (s)		0.0			38.8			21.3			35.2	
Approach LOS		A			D			C			D	

Intersection Summary			
HCM Average Control Delay	33.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	111.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	49.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Candlelight
2: SR-905 WB Ramps & Caliente Ave

Existing Baseline
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	49	0	85	296	561	0	0	174	661
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6	4.6	4.2	4.6			4.6	
Lane Util. Factor					1.00	1.00	1.00	0.91			0.91	
Frt					1.00	0.85	1.00	1.00			0.88	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1770	1583	1770	5085			4481	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1770	1583	1770	5085			4481	
Peak-hour factor, PHF	0.25	0.25	0.25	0.93	0.93	0.93	0.80	0.80	0.80	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	53	0	91	370	701	0	0	193	734
RTOR Reduction (vph)	0	0	0	0	0	82	0	0	0	0	343	0
Lane Group Flow (vph)	0	0	0	0	53	9	370	701	0	0	584	0
Turn Type				Perm		Perm	Prot					
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					6.0	6.0	15.4	45.8			26.2	
Effective Green, g (s)					6.0	6.0	15.4	45.8			26.2	
Actuated g/C Ratio					0.10	0.10	0.25	0.75			0.43	
Clearance Time (s)					4.6	4.6	4.2	4.6			4.6	
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)					174	156	447	3818			1925	
v/s Ratio Prot							c0.21	0.14			c0.13	
v/s Ratio Perm					0.03	0.01						
v/c Ratio					0.30	0.06	0.83	0.18			0.30	
Uniform Delay, d1					25.6	24.9	21.5	2.2			11.4	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					1.0	0.2	11.9	0.1			0.4	
Delay (s)					26.6	25.1	33.5	2.3			11.8	
Level of Service					C	C	C	A			B	
Approach Delay (s)		0.0			25.6			13.1			11.8	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM Average Control Delay	13.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	61.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	50.0%	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)	410	1	236	0	0	0	0	439	41	52	166	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1						4.1		3.7	4.1	
Lane Util. Factor	0.95	0.95						0.91		1.00	0.95	
Frt	1.00	0.89						0.99		1.00	1.00	
Flt Protected	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (prot)	1681	1550						5021		1770	3539	
Flt Permitted	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (perm)	1681	1550						5021		1770	3539	
Peak-hour factor, PHF	0.82	0.82	0.82	0.25	0.25	0.25	0.69	0.69	0.69	0.79	0.79	0.79
Adj. Flow (vph)	500	1	288	0	0	0	0	636	59	66	210	0
RTOR Reduction (vph)	0	169	0	0	0	0	0	17	0	0	0	0
Lane Group Flow (vph)	410	210	0	0	0	0	0	678	0	66	210	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	17.6	17.6						12.8		3.0	19.5	
Effective Green, g (s)	17.6	17.6						12.8		3.0	19.5	
Actuated g/C Ratio	0.39	0.39						0.28		0.07	0.43	
Clearance Time (s)	4.1	4.1						4.1		3.7	4.1	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	653	602						1419		117	1523	
v/s Ratio Prot	c0.24	0.14						c0.14		c0.04	0.06	
v/s Ratio Perm												
v/c Ratio	0.63	0.35						0.48		0.56	0.14	
Uniform Delay, d1	11.2	9.8						13.5		20.5	7.8	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	1.9	0.4						0.3		6.1	0.0	
Delay (s)	13.1	10.1						13.7		26.6	7.9	
Level of Service	B	B						B		C	A	
Approach Delay (s)		11.7			0.0			13.7			12.3	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM Average Control Delay	12.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	45.3	Sum of lost time (s)	11.9
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	364	6	14	113	58	344
Peak Hour Factor	0.76	0.76	0.50	0.50	0.70	0.70
Hourly flow rate (vph)	479	8	28	226	83	491

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total (vph)	319	168	254	83	491
Volume Left (vph)	319	160	28	0	0
Volume Right (vph)	0	8	0	0	491
Hadj (s)	0.53	0.48	0.06	0.03	-0.67
Departure Headway (s)	7.3	7.3	6.8	6.6	5.9
Degree Utilization, x	0.65	0.34	0.48	0.15	0.81
Capacity (veh/h)	469	476	500	522	593
Control Delay (s)	21.8	12.8	15.9	9.6	28.2
Approach Delay (s)	18.7		15.9	25.5	
Approach LOS	C		C	D	

Intersection Summary			
Delay	21.1		
HCM Level of Service	C		
Intersection Capacity Utilization	34.7%	ICU Level of Service	A
Analysis Period (min)	15		

Candlelight
1: Otay Mesa Rd & Caliente Ave

Existing Plus Project
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰↰		↱		↑↑	↱	↰↰	↑↑	
Volume (vph)	0	0	0	285	0	55	0	220	474	182	377	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.2		5.2		5.6	5.6	5.2	5.6	
Lane Util. Factor				0.97		1.00		0.95	1.00	0.97	0.95	
Frt				1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected				0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)				3433		1583		3539	1583	3433	3539	
Flt Permitted				0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)				3433		1583		3539	1583	3433	3539	
Peak-hour factor, PHF	0.25	0.25	0.25	0.85	0.85	0.85	0.75	0.75	0.75	0.76	0.76	0.76
Adj. Flow (vph)	0	0	0	335	0	65	0	293	632	239	496	0
RTOR Reduction (vph)	0	0	0	0	0	50	0	0	275	0	0	0
Lane Group Flow (vph)	0	0	0	335	0	15	0	293	357	239	496	0
Turn Type				Prot		custom			Perm	Prot		
Protected Phases				1		7		8		7	4	
Permitted Phases						6			8			
Actuated Green, G (s)				13.3		18.6		47.0	47.0	6.8	59.0	
Effective Green, g (s)				13.3		18.6		47.0	47.0	6.8	59.0	
Actuated g/C Ratio				0.16		0.22		0.57	0.57	0.08	0.71	
Clearance Time (s)				5.2		5.2		5.6	5.6	5.2	5.6	
Vehicle Extension (s)				3.0		3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				549		354		2002	895	281	2513	
v/s Ratio Prot				c0.10		0.00		0.08		c0.07	0.14	
v/s Ratio Perm						0.01			c0.23			
v/c Ratio				0.61		0.04		0.15	0.40	0.85	0.20	
Uniform Delay, d1				32.5		25.3		8.5	10.1	37.6	4.1	
Progression Factor				1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2				2.0		0.0		0.2	1.3	21.1	0.0	
Delay (s)				34.5		25.3		8.7	11.5	58.7	4.1	
Level of Service				C		C		A	B	E	A	
Approach Delay (s)		0.0			33.0			10.6			21.9	
Approach LOS		A			C			B			C	

Intersection Summary			
HCM Average Control Delay	19.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	83.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Candlelight
2: SR-905 WB Ramps & Caliente Ave

Existing Plus Project
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰↑	↱	↰	↑↑↑			↑↑↱	
Volume (vph)	0	0	0	28	1	31	229	696	0	0	249	417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6	4.6	4.2	4.6			4.6	
Lane Util. Factor					1.00	1.00	1.00	0.91			0.91	
Frt					1.00	0.85	1.00	1.00			0.91	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1776	1583	1770	5085			4608	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1776	1583	1770	5085			4608	
Peak-hour factor, PHF	0.25	0.25	0.25	0.79	0.79	0.79	0.84	0.84	0.84	0.83	0.83	0.83
Adj. Flow (vph)	0	0	0	35	1	39	273	829	0	0	300	502
RTOR Reduction (vph)	0	0	0	0	0	36	0	0	0	0	255	0
Lane Group Flow (vph)	0	0	0	0	36	3	273	829	0	0	547	0
Turn Type				Perm		Perm	Prot					
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					4.3	4.3	13.2	47.4			30.0	
Effective Green, g (s)					4.3	4.3	13.2	47.4			30.0	
Actuated g/C Ratio					0.07	0.07	0.22	0.78			0.49	
Clearance Time (s)					4.6	4.6	4.2	4.6			4.6	
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)					125	112	384	3958			2270	
v/s Ratio Prot							c0.15	0.16			c0.12	
v/s Ratio Perm					0.02	0.00						
v/c Ratio					0.29	0.02	0.71	0.21			0.24	
Uniform Delay, d1					26.8	26.3	22.1	1.8			8.9	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					1.3	0.1	6.1	0.1			0.3	
Delay (s)					28.1	26.4	28.2	1.9			9.1	
Level of Service					C	C	C	A			A	
Approach Delay (s)		0.0			27.2			8.4			9.1	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM Average Control Delay	9.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	60.9	Sum of lost time (s)	13.4
Intersection Capacity Utilization	47.7%	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)	415	3	343	0	0	0	0	502	70	58	202	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1						4.1		3.7	4.1	
Lane Util. Factor	0.95	0.95						0.91		1.00	0.95	
Frt	1.00	0.87						0.98		1.00	1.00	
Flt Protected	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (prot)	1681	1527						4992		1770	3539	
Flt Permitted	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (perm)	1681	1527						4992		1770	3539	
Peak-hour factor, PHF	0.84	0.84	0.84	0.25	0.25	0.25	0.77	0.77	0.77	0.83	0.83	0.83
Adj. Flow (vph)	494	4	408	0	0	0	0	652	91	70	243	0
RTOR Reduction (vph)	0	244	0	0	0	0	0	27	0	0	0	0
Lane Group Flow (vph)	445	217	0	0	0	0	0	716	0	70	243	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	19.7	19.7						14.2		3.1	21.0	
Effective Green, g (s)	19.7	19.7						14.2		3.1	21.0	
Actuated g/C Ratio	0.40	0.40						0.29		0.06	0.43	
Clearance Time (s)	4.1	4.1						4.1		3.7	4.1	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	677	615						1450		112	1520	
v/s Ratio Prot	c0.26	0.14						c0.14		c0.04	0.07	
v/s Ratio Perm												
v/c Ratio	0.66	0.35						0.49		0.62	0.16	
Uniform Delay, d1	11.9	10.2						14.4		22.3	8.5	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	2.3	0.4						0.3		10.4	0.0	
Delay (s)	14.2	10.5						14.6		32.7	8.6	
Level of Service	B	B						B		C	A	
Approach Delay (s)		12.3			0.0			14.6			14.0	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM Average Control Delay	13.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	48.9	Sum of lost time (s)	11.9
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	303	24	40	237	177	368
Peak Hour Factor	0.74	0.74	0.58	0.58	0.72	0.72
Hourly flow rate (vph)	409	32	69	409	246	511

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total (vph)	273	169	478	246	511
Volume Left (vph)	273	136	69	0	0
Volume Right (vph)	0	32	0	0	511
Hadj (s)	0.53	0.30	0.06	0.03	-0.67
Departure Headway (s)	8.2	8.0	6.9	7.1	6.4
Degree Utilization, x	0.62	0.37	0.92	0.48	0.91
Capacity (veh/h)	434	445	508	501	559
Control Delay (s)	22.6	14.4	48.7	15.4	42.2
Approach Delay (s)	19.5		48.7	33.5	
Approach LOS	C		E	D	

Intersection Summary			
Delay	34.1		
HCM Level of Service	D		
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		

Candlelight
5: Public Street A & Caliente Ave

Existing Plus Project
Timing Plan: AM PEAK

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	18	0	0	164	41	5
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	0	0	178	45	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	267	89	95	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	267	89	95	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	97	100	100	84	97	
cM capacity (veh/h)	561	779	774	1085	1623	

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	20	178	45	5
Volume Left	20	0	45	0
Volume Right	0	178	0	5
cSH	561	1085	1623	1700
Volume to Capacity	0.03	0.16	0.03	0.00
Queue Length 95th (ft)	3	15	2	0
Control Delay (s)	11.7	9.0	7.3	0.0
Lane LOS	B	A	A	
Approach Delay (s)	11.7	9.0	6.5	
Approach LOS	B	A		

Intersection Summary			
Average Delay	8.7		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

Candlelight
1: Otay Mesa Rd & Caliente Ave

Existing Plus Project
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	894	0	144	0	340	278	141	200	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.2		5.2		5.6	5.6	5.2	5.6	
Lane Util. Factor				0.97		1.00		0.95	1.00	0.97	0.95	
Frt				1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected				0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)				3433		1583		3539	1583	3433	3539	
Flt Permitted				0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)				3433		1583		3539	1583	3433	3539	
Peak-hour factor, PHF	0.25	0.25	0.25	0.73	0.73	0.73	0.84	0.84	0.84	0.91	0.91	0.91
Adj. Flow (vph)	0	0	0	1225	0	197	0	405	331	155	220	0
RTOR Reduction (vph)	0	0	0	0	0	112	0	0	194	0	0	0
Lane Group Flow (vph)	0	0	0	1225	0	85	0	405	137	155	220	0
Turn Type				Prot		custom			Perm	Prot		
Protected Phases				1		7		8		7	4	
Permitted Phases						6			8			
Actuated Green, G (s)				43.5		48.8		47.0	47.0	6.8	59.0	
Effective Green, g (s)				43.5		48.8		47.0	47.0	6.8	59.0	
Actuated g/C Ratio				0.38		0.43		0.41	0.41	0.06	0.52	
Clearance Time (s)				5.2		5.2		5.6	5.6	5.2	5.6	
Vehicle Extension (s)				3.0		3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				1318		682		1468	657	206	1843	
v/s Ratio Prot				c0.36		0.01		c0.11		c0.05	0.06	
v/s Ratio Perm						0.05			0.09			
v/c Ratio				0.93		0.12		0.28	0.21	0.75	0.12	
Uniform Delay, d1				33.4		19.4		21.9	21.2	52.4	13.9	
Progression Factor				1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2				11.5		0.1		0.5	0.7	14.4	0.0	
Delay (s)				44.9		19.5		22.4	22.0	66.8	13.9	
Level of Service				D		B		C	C	E	B	
Approach Delay (s)		0.0			41.4			22.2			35.8	
Approach LOS		A			D			C			D	

Intersection Summary			
HCM Average Control Delay	35.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	113.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Candlelight
2: SR-905 WB Ramps & Caliente Ave

Existing Plus Project
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↱	↰	↑↑↑			↑↑↱	
Volume (vph)	0	0	0	72	0	85	328	586	0	0	232	661
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6	4.6	4.2	4.6			4.6	
Lane Util. Factor					1.00	1.00	1.00	0.91			0.91	
Frt					1.00	0.85	1.00	1.00			0.89	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1770	1583	1770	5085			4521	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1770	1583	1770	5085			4521	
Peak-hour factor, PHF	0.25	0.25	0.25	0.93	0.93	0.93	0.80	0.80	0.80	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	77	0	91	410	732	0	0	258	734
RTOR Reduction (vph)	0	0	0	0	0	81	0	0	0	0	343	0
Lane Group Flow (vph)	0	0	0	0	77	10	410	732	0	0	649	0
Turn Type				Perm		Perm	Prot					
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					6.7	6.7	15.9	45.8			25.7	
Effective Green, g (s)					6.7	6.7	15.9	45.8			25.7	
Actuated g/C Ratio					0.11	0.11	0.26	0.74			0.42	
Clearance Time (s)					4.6	4.6	4.2	4.6			4.6	
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)					192	172	456	3775			1883	
v/s Ratio Prot							c0.23	0.14			c0.14	
v/s Ratio Perm					0.04	0.01						
v/c Ratio					0.40	0.06	0.90	0.19			0.34	
Uniform Delay, d1					25.6	24.7	22.1	2.4			12.3	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					1.4	0.1	20.1	0.1			0.5	
Delay (s)					27.0	24.8	42.2	2.5			12.8	
Level of Service					C	C	D	A			B	
Approach Delay (s)		0.0			25.8			16.8			12.8	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM Average Control Delay	15.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	61.7	Sum of lost time (s)	13.4
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Candlelight
3: SR-905 EB Ramps & Caliente Ave

Existing Plus Project
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↑↱						↑↑↱		↰	↑↑	
Volume (vph)	410	1	312	0	0	0	0	496	51	52	247	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1						4.1		3.7	4.1	
Lane Util. Factor	0.95	0.95						0.91		1.00	0.95	
Frt	1.00	0.87						0.99		1.00	1.00	
Flt Protected	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (prot)	1681	1527						5014		1770	3539	
Flt Permitted	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (perm)	1681	1527						5014		1770	3539	
Peak-hour factor, PHF	0.82	0.82	0.82	0.25	0.25	0.25	0.69	0.69	0.69	0.79	0.79	0.79
Adj. Flow (vph)	500	1	380	0	0	0	0	719	74	66	313	0
RTOR Reduction (vph)	0	230	0	0	0	0	0	18	0	0	0	0
Lane Group Flow (vph)	450	201	0	0	0	0	0	775	0	66	313	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	19.3	19.3						14.8		3.0	21.5	
Effective Green, g (s)	19.3	19.3						14.8		3.0	21.5	
Actuated g/C Ratio	0.39	0.39						0.30		0.06	0.44	
Clearance Time (s)	4.1	4.1						4.1		3.7	4.1	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	662	601						1514		108	1553	
v/s Ratio Prot	c0.27	0.13						c0.15		c0.04	0.09	
v/s Ratio Perm												
v/c Ratio	0.68	0.33						0.51		0.61	0.20	
Uniform Delay, d1	12.3	10.4						14.1		22.4	8.5	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	2.8	0.3						0.3		9.8	0.1	
Delay (s)	15.1	10.7						14.4		32.3	8.5	
Level of Service	B	B						B		C	A	
Approach Delay (s)		12.9			0.0			14.4			12.7	
Approach LOS		B			A			B			B	

Intersection Summary			
HCM Average Control Delay	13.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	49.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Stop	Stop	
Volume (vph)	364	29	24	180	215	344
Peak Hour Factor	0.76	0.76	0.50	0.50	0.70	0.70
Hourly flow rate (vph)	479	38	48	360	307	491

Direction, Lane #	EB 1	EB 2	NB 1	SB 1	SB 2
Volume Total (vph)	319	198	408	307	491
Volume Left (vph)	319	160	48	0	0
Volume Right (vph)	0	38	0	0	491
Hadj (s)	0.53	0.30	0.06	0.03	-0.67
Departure Headway (s)	8.1	7.9	7.1	7.2	6.5
Degree Utilization, x	0.72	0.43	0.81	0.61	0.88
Capacity (veh/h)	431	447	497	494	550
Control Delay (s)	27.9	15.5	33.4	19.7	39.0
Approach Delay (s)	23.1		33.4	31.6	
Approach LOS	C		D	D	

Intersection Summary			
Delay	29.5		
HCM Level of Service	D		
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	8	0	0	69	162	18
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	0	0	75	176	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	427	352	372	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	427	352	372	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	98	100	100	93	89	
cM capacity (veh/h)	459	510	498	1085	1623	

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	9	75	176	20
Volume Left	9	0	176	0
Volume Right	0	75	0	20
cSH	459	1085	1623	1700
Volume to Capacity	0.02	0.07	0.11	0.01
Queue Length 95th (ft)	1	6	9	0
Control Delay (s)	13.0	8.6	7.5	0.0
Lane LOS	B	A	A	
Approach Delay (s)	13.0	8.6	6.7	
Approach LOS	B	A		

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	22.3%	ICU Level of Service	A
Analysis Period (min)	15		

1: Otay Mesa Rd & Caliente Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰↰	↑↑	↱	↰	↑↑	↱	↰↰	↑↑↱	
Volume (vph)	0	2	0	316	10	115	10	344	608	288	485	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		5.2	6.7	5.2	5.2	5.6	5.6	5.2	5.6	
Lane Util. Factor		0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frt		1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3539		3433	3539	1583	1770	3539	1583	3433	3539	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3539		3433	3539	1583	1770	3539	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.85	0.85	0.85	0.75	0.75	0.75	0.76	0.76	0.76
Adj. Flow (vph)	0	2	0	372	12	135	13	459	811	379	638	0
RTOR Reduction (vph)	0	0	0	0	0	90	0	0	418	0	0	0
Lane Group Flow (vph)	0	2	0	372	12	45	13	459	393	379	638	0
Turn Type	Prot		Perm	Prot		pm+ov	Prot		Perm	Prot		
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)		5.6		15.6	23.7	32.5	33.0	47.0	47.0	8.8	22.8	
Effective Green, g (s)		5.6		15.6	23.7	32.5	33.0	47.0	47.0	8.8	22.8	
Actuated g/C Ratio		0.06		0.16	0.24	0.34	0.34	0.48	0.48	0.09	0.24	
Clearance Time (s)		4.0		5.2	6.7	5.2	5.2	5.6	5.6	5.2	5.6	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		204		552	865	530	602	1715	767	311	832	
v/s Ratio Prot		0.00		c0.11	0.00	c0.01	0.01	0.13		c0.11	c0.18	
v/s Ratio Perm						0.02			c0.25			
v/c Ratio		0.01		0.67	0.01	0.09	0.02	0.27	0.51	1.22	0.77	
Uniform Delay, d1		43.1		38.3	27.8	22.1	21.3	14.8	17.1	44.1	34.6	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0		3.2	0.0	0.1	0.1	0.4	2.4	124.0	4.3	
Delay (s)		43.1		41.6	27.8	22.1	21.3	15.2	19.6	168.1	38.9	
Level of Service		D		D	C	C	C	B	B	F	D	
Approach Delay (s)		43.1			36.2			18.0			87.0	
Approach LOS		D			D			B			F	

Intersection Summary			
HCM Average Control Delay	46.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	97.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

2: SR-905 WB Ramps & Caliente Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰↑	↱	↰	↑↑↑			↑↑↑↱	
Volume (vph)	0	0	0	32	1	50	258	945	0	0	317	488
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6	4.6	4.2	4.6			4.6	
Lane Util. Factor					1.00	1.00	1.00	0.91			0.91	
Frt					1.00	0.85	1.00	1.00			0.91	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1776	1583	1770	5085			4623	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1776	1583	1770	5085			4623	
Peak-hour factor, PHF	0.25	0.25	0.25	0.79	0.79	0.79	0.84	0.84	0.84	0.83	0.83	0.83
Adj. Flow (vph)	0	0	0	41	1	63	307	1125	0	0	382	588
RTOR Reduction (vph)	0	0	0	0	0	58	0	0	0	0	304	0
Lane Group Flow (vph)	0	0	0	0	42	5	307	1125	0	0	666	0
Turn Type				Perm		Perm	Prot					
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					4.3	4.3	10.9	41.9			26.8	
Effective Green, g (s)					4.3	4.3	10.9	41.9			26.8	
Actuated g/C Ratio					0.08	0.08	0.20	0.76			0.48	
Clearance Time (s)					4.6	4.6	4.2	4.6			4.6	
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)					138	123	348	3846			2236	
v/s Ratio Prot							c0.17	c0.22			0.14	
v/s Ratio Perm					0.02	0.00						
v/c Ratio					0.30	0.04	0.88	0.29			0.30	
Uniform Delay, d1					24.1	23.6	21.6	2.1			8.6	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					1.3	0.1	22.1	0.2			0.3	
Delay (s)					25.4	23.8	43.7	2.3			9.0	
Level of Service					C	C	D	A			A	
Approach Delay (s)		0.0			24.4			11.2			9.0	
Approach LOS		A			C			B			A	

Intersection Summary			
HCM Average Control Delay	10.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	55.4	Sum of lost time (s)	8.8
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Candlelight
3: SR-905 EB Ramps & Caliente Ave

Near Term Baseline
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	✥						↑↑↱		↰	↑↑	
Volume (vph)	619	68	390	0	0	0	0	584	81	106	227	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1						4.1		3.7	4.1	
Lane Util. Factor	0.95	0.95						0.91		1.00	0.95	
Frt	1.00	0.89						0.98		1.00	1.00	
Flt Protected	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (prot)	1681	1561						4992		1770	3539	
Flt Permitted	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (perm)	1681	1561						4992		1770	3539	
Peak-hour factor, PHF	0.84	0.84	0.84	0.25	0.25	0.25	0.77	0.77	0.77	0.83	0.83	0.83
Adj. Flow (vph)	737	81	464	0	0	0	0	758	105	128	273	0
RTOR Reduction (vph)	0	147	0	0	0	0	0	28	0	0	0	0
Lane Group Flow (vph)	663	472	0	0	0	0	0	835	0	128	273	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	28.3	28.3						16.8		5.4	25.9	
Effective Green, g (s)	28.3	28.3						16.8		5.4	25.9	
Actuated g/C Ratio	0.45	0.45						0.27		0.09	0.42	
Clearance Time (s)	4.1	4.1						4.1		3.7	4.1	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	762	708						1344		153	1469	
v/s Ratio Prot	c0.39	0.30						c0.17		c0.07	0.08	
v/s Ratio Perm												
v/c Ratio	0.87	0.67						0.62		0.84	0.19	
Uniform Delay, d1	15.4	13.4						20.0		28.1	11.6	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	10.6	2.4						0.9		30.9	0.1	
Delay (s)	26.0	15.7						20.9		58.9	11.6	
Level of Service	C	B						C		E	B	
Approach Delay (s)		21.0			0.0			20.9			26.7	
Approach LOS		C			A			C			C	

Intersection Summary			
HCM Average Control Delay	21.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	62.4	Sum of lost time (s)	11.9
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Candlelight
4: Airway Rd & Caliente Ave

Near Term Baseline
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	✥			↰↑	↱		↰↑↱			↰↑	↱
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	411	7	18	0	17	113	33	145	0	46	137	479
Peak Hour Factor	0.74	0.92	0.74	0.92	0.92	0.92	0.58	0.58	0.92	0.92	0.72	0.72
Hourly flow rate (vph)	555	8	24	0	18	123	57	250	0	50	190	665

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	370	217	18	123	182	125	240	665
Volume Left (vph)	370	185	0	0	57	0	50	0
Volume Right (vph)	0	24	0	123	0	0	0	665
Hadj (s)	0.53	0.38	0.03	-0.67	0.19	0.03	0.14	-0.67
Departure Headway (s)	8.1	8.0	8.6	7.9	8.3	8.1	7.6	6.8
Degree Utilization, x	0.84	0.48	0.04	0.27	0.42	0.28	0.51	1.26
Capacity (veh/h)	436	443	401	437	413	428	464	536
Control Delay (s)	39.9	17.0	10.8	12.6	15.9	13.1	17.0	150.8
Approach Delay (s)	31.4		12.4		14.8		115.3	
Approach LOS	D		B		B		F	

Intersection Summary			
Delay	66.5		
HCM Level of Service	F		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

Candlelight
1: Otay Mesa Rd & Caliente Ave

Near Term Baseline
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰↰	↑↑	↱	↰	↑↑	↱	↰↰	↑↑↱	
Volume (vph)	0	1	0	1015	30	225	4	681	340	225	276	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		5.2	6.7	5.2	5.2	5.6	5.6	5.2	5.6	
Lane Util. Factor		0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frt		1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3539		3433	3539	1583	1770	3539	1583	3433	3539	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3539		3433	3539	1583	1770	3539	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.73	0.73	0.73	0.84	0.84	0.84	0.91	0.91	0.91
Adj. Flow (vph)	0	1	0	1390	41	308	5	811	405	247	303	0
RTOR Reduction (vph)	0	0	0	0	0	18	0	0	247	0	0	0
Lane Group Flow (vph)	0	1	0	1390	41	290	5	811	158	247	303	0
Turn Type	Perm		Perm	Prot		pm+ov	Prot		Perm	Prot		
Protected Phases		2		1	6	7	3	8		7	4	
Permitted Phases	2		2			6			8			
Actuated Green, G (s)		5.6		49.8	57.9	67.7	40.2	47.0	47.0	9.8	16.6	
Effective Green, g (s)		5.6		49.8	57.9	67.7	40.2	47.0	47.0	9.8	16.6	
Actuated g/C Ratio		0.04		0.38	0.44	0.51	0.30	0.36	0.36	0.07	0.13	
Clearance Time (s)		4.0		5.2	6.7	5.2	5.2	5.6	5.6	5.2	5.6	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		150		1293	1550	811	538	1258	563	254	444	
v/s Ratio Prot		0.00		c0.40	0.01	c0.03	0.00	c0.23		c0.07	0.09	
v/s Ratio Perm						0.16			0.10			
v/c Ratio		0.01		1.08	0.03	0.36	0.01	0.64	0.28	0.97	0.68	
Uniform Delay, d1		60.6		41.2	21.1	19.3	32.1	35.6	30.5	61.1	55.3	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0		47.8	0.0	0.3	0.0	2.6	1.2	48.5	4.3	
Delay (s)		60.7		89.0	21.1	19.5	32.1	38.2	31.7	109.6	59.6	
Level of Service		E		F	C	B	C	D	C	F	E	
Approach Delay (s)		60.7			75.1			36.0			82.0	
Approach LOS		E			E			D			F	

Intersection Summary			
HCM Average Control Delay	62.6	HCM Level of Service	E
HCM Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	132.2	Sum of lost time (s)	21.2
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Candlelight
2: SR-905 WB Ramps & Caliente Ave

Near Term Baseline
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰↑	↱	↰	↑↑↑			↑↑↱	
Volume (vph)	0	0	0	82	0	108	371	1013	0	0	297	794
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6	4.6	4.2	4.6			4.6	
Lane Util. Factor					1.00	1.00	1.00	0.91			0.91	
Frt					1.00	0.85	1.00	1.00			0.89	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1770	1583	1770	5085			4530	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1770	1583	1770	5085			4530	
Peak-hour factor, PHF	0.25	0.25	0.25	0.93	0.93	0.93	0.80	0.80	0.80	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	88	0	116	464	1266	0	0	330	882
RTOR Reduction (vph)	0	0	0	0	0	79	0	0	0	0	322	0
Lane Group Flow (vph)	0	0	0	0	88	37	464	1266	0	0	890	0
Turn Type				Perm		Perm	Prot					
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					7.3	7.3	20.0	50.8			26.6	
Effective Green, g (s)					7.3	7.3	20.0	50.8			26.6	
Actuated g/C Ratio					0.11	0.11	0.30	0.75			0.40	
Clearance Time (s)					4.6	4.6	4.2	4.6			4.6	
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)					192	172	526	3838			1790	
v/s Ratio Prot							c0.26	0.25			c0.20	
v/s Ratio Perm					0.05	0.02						
v/c Ratio					0.46	0.21	0.88	0.33			0.91dr	
Uniform Delay, d1					28.1	27.4	22.5	2.7			15.3	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					1.7	0.6	15.9	0.2			1.0	
Delay (s)					29.9	28.0	38.4	2.9			16.3	
Level of Service					C	C	D	A			B	
Approach Delay (s)		0.0			28.8			12.5			16.3	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM Average Control Delay	15.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	67.3	Sum of lost time (s)	13.4
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		
dr Defacto Right Lane. Recode with 1 though lane as a right lane.			
c Critical Lane Group			

Candlelight
3: SR-905 EB Ramps & Caliente Ave

Near Term Baseline
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	762	29	362	0	0	0	0	901	58	83	291	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1						4.1		3.7	4.1	
Lane Util. Factor	0.95	0.95						0.91		1.00	0.95	
Frt	1.00	0.90						0.99		1.00	1.00	
Flt Protected	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (prot)	1681	1574						5039		1770	3539	
Flt Permitted	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (perm)	1681	1574						5039		1770	3539	
Peak-hour factor, PHF	0.82	0.82	0.82	0.25	0.25	0.25	0.69	0.69	0.69	0.79	0.79	0.79
Adj. Flow (vph)	929	35	441	0	0	0	0	1306	84	105	368	0
RTOR Reduction (vph)	0	93	0	0	0	0	0	10	0	0	0	0
Lane Group Flow (vph)	725	587	0	0	0	0	0	1380	0	105	368	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	31.0	31.0						21.5		4.1	29.3	
Effective Green, g (s)	31.0	31.0						21.5		4.1	29.3	
Actuated g/C Ratio	0.45	0.45						0.31		0.06	0.43	
Clearance Time (s)	4.1	4.1						4.1		3.7	4.1	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	761	712						1582		106	1514	
v/s Ratio Prot	c0.43	0.37						c0.27		c0.06	0.10	
v/s Ratio Perm												
v/c Ratio	0.95	0.82						0.87		0.99	0.24	
Uniform Delay, d1	18.0	16.4						22.2		32.2	12.5	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	21.7	7.7						5.6		84.2	0.1	
Delay (s)	39.7	24.1						27.8		116.4	12.6	
Level of Service	D	C						C		F	B	
Approach Delay (s)		32.2			0.0			27.8			35.6	
Approach LOS		C			A			C			D	

Intersection Summary				
HCM Average Control Delay	30.8	HCM Level of Service		C
HCM Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	68.5	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	86.0%	ICU Level of Service		E
Analysis Period (min)	15			
c Critical Lane Group				

Candlelight
4: Airway Rd & Caliente Ave

Near Term Baseline
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	473	27	6	0	7	48	21	141	0	182	58	459
Peak Hour Factor	0.76	0.92	0.76	0.92	0.92	0.92	0.50	0.50	0.92	0.92	0.70	0.70
Hourly flow rate (vph)	622	29	8	0	8	52	42	282	0	198	83	656

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	415	245	8	52	183	141	281	656
Volume Left (vph)	415	207	0	0	42	0	198	0
Volume Right (vph)	0	8	0	52	0	0	0	656
Hadj (s)	0.53	0.44	0.03	-0.67	0.15	0.03	0.39	-0.67
Departure Headway (s)	8.0	7.9	8.8	8.1	8.2	8.1	7.8	6.7
Degree Utilization, x	0.93	0.54	0.02	0.12	0.42	0.32	0.61	1.23
Capacity (veh/h)	440	439	386	418	418	430	454	540
Control Delay (s)	53.2	18.6	10.7	11.0	15.8	13.7	20.9	139.4
Approach Delay (s)	40.4		10.9		14.9		103.9	
Approach LOS	E		B		B		F	

Intersection Summary			
Delay	65.3		
HCM Level of Service	F		
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	2	0	328	10	115	10	355	655	288	488	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		5.2	6.7	5.2	5.2	5.6	5.6	5.2	5.6	
Lane Util. Factor		0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frt		1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3539		3433	3539	1583	1770	3539	1583	3433	3539	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3539		3433	3539	1583	1770	3539	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.85	0.85	0.85	0.75	0.75	0.75	0.76	0.76	0.76
Adj. Flow (vph)	0	2	0	386	12	135	13	473	873	379	642	0
RTOR Reduction (vph)	0	0	0	0	0	89	0	0	452	0	0	0
Lane Group Flow (vph)	0	2	0	386	12	46	13	473	421	379	642	0
Turn Type	Prot		Perm	Prot		pm+ov	Prot		Perm	Prot		
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)		5.6		16.1	24.2	33.0	33.1	47.0	47.0	8.8	22.7	
Effective Green, g (s)		5.6		16.1	24.2	33.0	33.1	47.0	47.0	8.8	22.7	
Actuated g/C Ratio		0.06		0.17	0.25	0.34	0.34	0.48	0.48	0.09	0.23	
Clearance Time (s)		4.0		5.2	6.7	5.2	5.2	5.6	5.6	5.2	5.6	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		203		567	878	536	601	1706	763	310	824	
v/s Ratio Prot		0.00		c0.11	0.00	c0.01	0.01	0.13		c0.11	c0.18	
v/s Ratio Perm						0.02			c0.27			
v/c Ratio		0.01		0.68	0.01	0.09	0.02	0.28	0.55	1.22	0.78	
Uniform Delay, d1		43.3		38.3	27.6	22.0	21.4	15.1	17.8	44.4	35.1	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0		3.4	0.0	0.1	0.1	0.4	2.9	125.6	4.7	
Delay (s)		43.4		41.6	27.7	22.0	21.5	15.5	20.7	169.9	39.7	
Level of Service		D		D	C	C	C	B	C	F	D	
Approach Delay (s)		43.4			36.4			18.9			88.1	
Approach LOS		D			D			B			F	

Intersection Summary			
HCM Average Control Delay	46.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	97.5	Sum of lost time (s)	15.6
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
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	38	1	50	334	1003	0	0	332	488
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6	4.6	4.2	4.6			4.6	
Lane Util. Factor					1.00	1.00	1.00	0.91			0.91	
Frt					1.00	0.85	1.00	1.00			0.91	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1776	1583	1770	5085			4631	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1776	1583	1770	5085			4631	
Peak-hour factor, PHF	0.25	0.25	0.25	0.79	0.79	0.79	0.84	0.84	0.84	0.83	0.83	0.83
Adj. Flow (vph)	0	0	0	48	1	63	398	1194	0	0	400	588
RTOR Reduction (vph)	0	0	0	0	0	57	0	0	0	0	340	0
Lane Group Flow (vph)	0	0	0	0	49	6	398	1194	0	0	648	0
Turn Type				Perm		Perm	Prot					
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					5.9	5.9	15.9	45.8			25.7	
Effective Green, g (s)					5.9	5.9	15.9	45.8			25.7	
Actuated g/C Ratio					0.10	0.10	0.26	0.75			0.42	
Clearance Time (s)					4.6	4.6	4.2	4.6			4.6	
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)					172	153	462	3824			1954	
v/s Ratio Prot							c0.22	c0.23			0.14	
v/s Ratio Perm					0.03	0.00						
v/c Ratio					0.28	0.04	0.86	0.31			0.33	
Uniform Delay, d1					25.5	24.9	21.5	2.4			11.8	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					0.9	0.1	15.1	0.2			0.5	
Delay (s)					26.5	25.0	36.6	2.7			12.3	
Level of Service					C	C	D	A			B	
Approach Delay (s)		0.0			25.7			11.1			12.3	
Approach LOS		A			C			B			B	

Intersection Summary			
HCM Average Control Delay	12.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	60.9	Sum of lost time (s)	8.8
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
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)	619	68	409	0	0	0	0	719	105	106	248	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1						4.1		3.7	4.1	
Lane Util. Factor	0.95	0.95						0.91		1.00	0.95	
Frt	1.00	0.89						0.98		1.00	1.00	
Flt Protected	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (prot)	1681	1559						4988		1770	3539	
Flt Permitted	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (perm)	1681	1559						4988		1770	3539	
Peak-hour factor, PHF	0.84	0.84	0.84	0.25	0.25	0.25	0.77	0.77	0.77	0.83	0.83	0.83
Adj. Flow (vph)	737	81	487	0	0	0	0	934	136	128	299	0
RTOR Reduction (vph)	0	160	0	0	0	0	0	29	0	0	0	0
Lane Group Flow (vph)	663	482	0	0	0	0	0	1041	0	128	299	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	28.5	28.5						20.0		5.3	29.0	
Effective Green, g (s)	28.5	28.5						20.0		5.3	29.0	
Actuated g/C Ratio	0.43	0.43						0.30		0.08	0.44	
Clearance Time (s)	4.1	4.1						4.1		3.7	4.1	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	729	676						1518		143	1562	
v/s Ratio Prot	c0.39	0.31						c0.21		c0.07	0.08	
v/s Ratio Perm												
v/c Ratio	0.91	0.71						0.69		0.90	0.19	
Uniform Delay, d1	17.4	15.3						20.1		29.9	11.2	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	15.2	3.6						1.3		45.2	0.1	
Delay (s)	32.6	18.8						21.4		75.1	11.3	
Level of Service	C	B						C		E	B	
Approach Delay (s)		25.8			0.0			21.4			30.4	
Approach LOS		C			A			C			C	

Intersection Summary			
HCM Average Control Delay	24.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	65.7	Sum of lost time (s)	11.9
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↑↱			↰↑	↱		↰↑↑↱			↰↑	↱
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	411	7	24	0	17	113	57	303	0	46	177	479
Peak Hour Factor	0.74	0.92	0.74	0.92	0.92	0.92	0.58	0.58	0.92	0.92	0.72	0.72
Hourly flow rate (vph)	555	8	32	0	18	123	98	522	0	50	246	665

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	370	225	18	123	359	261	296	665
Volume Left (vph)	370	185	0	0	98	0	50	0
Volume Right (vph)	0	32	0	123	0	0	0	665
Hadj (s)	0.53	0.34	0.03	-0.67	0.17	0.03	0.12	-0.67
Departure Headway (s)	8.9	8.7	9.5	8.8	8.6	8.4	8.4	7.6
Degree Utilization, x	0.91	0.54	0.05	0.30	0.86	0.61	0.69	1.40
Capacity (veh/h)	396	399	356	390	416	414	417	486
Control Delay (s)	54.8	20.4	11.8	14.4	43.8	22.6	26.7	213.8
Approach Delay (s)	41.8		14.0		34.9		156.2	
Approach LOS	E		B		D		F	

Intersection Summary			
Delay	85.7		
HCM Level of Service	F		
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	18	0	0	164	41	5
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	0	0	178	45	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					TWLTL	
Median storage veh)					2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	267	89	95	0	0	
vC1, stage 1 conf vol	89	89	0			
vC2, stage 2 conf vol	178	0	95			
vCu, unblocked vol	267	89	95	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)	6.1	5.5	5.5			
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	97	100	100	84	97	
cM capacity (veh/h)	625	778	775	1085	1623	

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	20	178	45	5
Volume Left	20	0	45	0
Volume Right	0	178	0	5
cSH	625	1085	1623	1700
Volume to Capacity	0.03	0.16	0.03	0.00
Queue Length 95th (ft)	2	15	2	0
Control Delay (s)	11.0	9.0	7.3	0.0
Lane LOS	B	A	A	
Approach Delay (s)	11.0	9.0	6.5	
Approach LOS	B	A		

Intersection Summary			
Average Delay	8.6		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1	0	1062	30	225	4	686	360	225	287	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		5.2	6.7	5.2	5.2	5.6	5.6	5.2	5.6	
Lane Util. Factor		0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frt		1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3539		3433	3539	1583	1770	3539	1583	3433	3539	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3539		3433	3539	1583	1770	3539	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.73	0.73	0.73	0.84	0.84	0.84	0.91	0.91	0.91
Adj. Flow (vph)	0	1	0	1455	41	308	5	817	429	247	315	0
RTOR Reduction (vph)	0	0	0	0	0	18	0	0	259	0	0	0
Lane Group Flow (vph)	0	1	0	1455	41	290	5	817	170	247	315	0
Turn Type	Perm		Perm	Prot		pm+ov	Prot		Perm	Prot		
Protected Phases		2		1	6	7	3	8		7	4	
Permitted Phases	2		2			6			8			
Actuated Green, G (s)		5.6		49.8	57.9	66.7	38.9	47.0	47.0	8.8	16.9	
Effective Green, g (s)		5.6		49.8	57.9	66.7	38.9	47.0	47.0	8.8	16.9	
Actuated g/C Ratio		0.04		0.38	0.44	0.51	0.30	0.36	0.36	0.07	0.13	
Clearance Time (s)		4.0		5.2	6.7	5.2	5.2	5.6	5.6	5.2	5.6	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		151		1303	1562	805	525	1268	567	230	456	
v/s Ratio Prot		0.00		c0.42	0.01	c0.02	0.00	c0.23		c0.07	0.09	
v/s Ratio Perm						0.16			0.11			
v/c Ratio		0.01		1.12	0.03	0.36	0.01	0.64	0.30	1.07	0.69	
Uniform Delay, d1		60.1		40.7	20.7	19.4	32.6	35.1	30.3	61.2	54.7	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0		63.4	0.0	0.3	0.0	2.5	1.4	80.3	4.5	
Delay (s)		60.2		104.1	20.7	19.7	32.6	37.7	31.6	141.5	59.1	
Level of Service		E		F	C	B	C	D	C	F	E	
Approach Delay (s)		60.2			87.8			35.6			95.3	
Approach LOS		E			F			D			F	

Intersection Summary			
HCM Average Control Delay	70.9	HCM Level of Service	E
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	131.2	Sum of lost time (s)	21.2
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Candlelight
2: SR-905 WB Ramps & Caliente Ave

Near Term Plus Project
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↱	↰	↑↑↑			↑↑↱	
Volume (vph)	0	0	0	105	0	108	403	1038	0	0	355	794
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6	4.6	4.2	4.6			4.6	
Lane Util. Factor					1.00	1.00	1.00	0.91			0.91	
Frt					1.00	0.85	1.00	1.00			0.90	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1770	1583	1770	5085			4558	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1770	1583	1770	5085			4558	
Peak-hour factor, PHF	0.25	0.25	0.25	0.93	0.93	0.93	0.80	0.80	0.80	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	113	0	116	504	1298	0	0	394	882
RTOR Reduction (vph)	0	0	0	0	0	78	0	0	0	0	315	0
Lane Group Flow (vph)	0	0	0	0	113	38	504	1298	0	0	961	0
Turn Type				Perm		Perm	Prot					
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					10.1	10.1	24.1	55.5			27.2	
Effective Green, g (s)					10.1	10.1	24.1	55.5			27.2	
Actuated g/C Ratio					0.14	0.14	0.32	0.74			0.36	
Clearance Time (s)					4.6	4.6	4.2	4.6			4.6	
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)					239	214	570	3773			1657	
v/s Ratio Prot							c0.28	0.26			c0.21	
v/s Ratio Perm					0.06	0.02						
v/c Ratio					0.47	0.18	0.88	0.34			0.98dr	
Uniform Delay, d1					29.9	28.7	24.0	3.3			19.2	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					1.5	0.4	15.1	0.2			1.5	
Delay (s)					31.4	29.1	39.1	3.6			20.7	
Level of Service					C	C	D	A			C	
Approach Delay (s)		0.0			30.2			13.5			20.7	
Approach LOS		A			C			B			C	

Intersection Summary			
HCM Average Control Delay	17.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	74.8	Sum of lost time (s)	13.4
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Candlelight
3: SR-905 EB Ramps & Caliente Ave

Near Term Plus Project
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↱						↑↑↱		↰	↑↑	
Volume (vph)	762	29	438	0	0	0	0	958	68	83	372	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1						4.1		3.7	4.1	
Lane Util. Factor	0.95	0.95						0.91		1.00	0.95	
Frt	1.00	0.89						0.99		1.00	1.00	
Flt Protected	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (prot)	1681	1556						5035		1770	3539	
Flt Permitted	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (perm)	1681	1556						5035		1770	3539	
Peak-hour factor, PHF	0.82	0.82	0.82	0.25	0.25	0.25	0.69	0.69	0.69	0.79	0.79	0.79
Adj. Flow (vph)	929	35	534	0	0	0	0	1388	99	105	471	0
RTOR Reduction (vph)	0	131	0	0	0	0	0	10	0	0	0	0
Lane Group Flow (vph)	780	587	0	0	0	0	0	1477	0	105	471	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	37.9	37.9						24.9		5.3	33.9	
Effective Green, g (s)	37.9	37.9						24.9		5.3	33.9	
Actuated g/C Ratio	0.47	0.47						0.31		0.07	0.42	
Clearance Time (s)	4.1	4.1						4.1		3.7	4.1	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	796	737						1567		117	1500	
v/s Ratio Prot	c0.46	0.38						c0.29		c0.06	0.13	
v/s Ratio Perm												
v/c Ratio	0.98	0.80						0.94		0.90	0.31	
Uniform Delay, d1	20.7	17.8						26.9		37.1	15.3	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	26.6	6.0						11.7		52.1	0.1	
Delay (s)	47.3	23.8						38.5		89.2	15.4	
Level of Service	D	C						D		F	B	
Approach Delay (s)		36.0			0.0			38.5			28.9	
Approach LOS		D			A			D			C	

Intersection Summary			
HCM Average Control Delay	35.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Candlelight
4: Airway Rd & Caliente Ave

Near Term Plus Project
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	473	27	29	0	7	48	31	208	0	182	215	459
Peak Hour Factor	0.76	0.92	0.76	0.92	0.92	0.92	0.50	0.50	0.92	0.92	0.70	0.70
Hourly flow rate (vph)	622	29	38	0	8	52	62	416	0	198	307	656

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	415	275	8	52	270	208	505	656
Volume Left (vph)	415	207	0	0	62	0	198	0
Volume Right (vph)	0	38	0	52	0	0	0	656
Hadj (s)	0.53	0.31	0.03	-0.67	0.15	0.03	0.23	-0.67
Departure Headway (s)	8.7	8.5	9.9	9.2	8.9	8.7	8.1	7.2
Degree Utilization, x	1.01	0.65	0.02	0.13	0.66	0.51	1.14	1.32
Capacity (veh/h)	415	412	351	378	397	397	443	507
Control Delay (s)	74.5	24.7	11.9	12.4	26.5	19.2	112.6	178.0
Approach Delay (s)	54.7		12.3		23.3		149.5	
Approach LOS	F		B		C		F	

Intersection Summary			
Delay	93.4		
HCM Level of Service	F		
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

Candlelight
5: Caliente Ave &

Near Term Plus Project
Timing Plan: PM PEAK

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	8	0	0	69	162	18
Sign Control		Stop	Stop		Free	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	0	0	75	176	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	427	352	372	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	427	352	372	0	0	
tC, single (s)	7.1	6.5	6.5	6.2	4.1	
tC, 2 stage (s)						
tF (s)	3.5	4.0	4.0	3.3	2.2	
p0 queue free %	98	100	100	93	89	
cM capacity (veh/h)	459	510	498	1085	1623	

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	9	75	176	20
Volume Left	9	0	176	0
Volume Right	0	75	0	20
cSH	459	1085	1623	1700
Volume to Capacity	0.02	0.07	0.11	0.01
Queue Length 95th (ft)	1	6	9	0
Control Delay (s)	13.0	8.6	7.5	0.0
Lane LOS	B	A	A	
Approach Delay (s)	13.0	8.6	6.7	
Approach LOS	B	A		

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	22.3%	ICU Level of Service	A
Analysis Period (min)	15		

Candlelight
1: Otay Mesa Rd & Caliente Ave

Horizon Year Baseline
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	48	0	384	21	337	10	452	791	873	663	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		5.2	6.7	5.2	5.2	5.6	5.6	5.2	5.6	
Lane Util. Factor		0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frt		1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3539		3433	3539	1583	1770	3539	1583	3433	3539	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3539		3433	3539	1583	1770	3539	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	52	0	417	23	366	11	491	860	949	721	0
RTOR Reduction (vph)	0	0	0	0	0	109	0	0	327	0	0	0
Lane Group Flow (vph)	0	52	0	417	23	257	11	491	533	949	721	0
Turn Type	Prot		Perm	Prot		pm+ov	Prot		Perm	Prot		
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)		7.2		20.1	29.8	58.6	44.2	47.1	47.1	28.8	31.7	
Effective Green, g (s)		7.2		20.1	29.8	58.6	44.2	47.1	47.1	28.8	31.7	
Actuated g/C Ratio		0.06		0.16	0.24	0.48	0.36	0.38	0.38	0.23	0.26	
Clearance Time (s)		4.0		5.2	6.7	5.2	5.2	5.6	5.6	5.2	5.6	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		207		560	856	753	635	1353	605	803	911	
v/s Ratio Prot		0.01		c0.12	0.01	c0.08	0.01	0.14		c0.28	0.20	
v/s Ratio Perm						0.08			c0.34			
v/c Ratio		0.25		0.74	0.03	0.34	0.02	0.36	0.88	1.18	0.79	
Uniform Delay, d1		55.4		49.1	35.6	20.2	25.5	27.3	35.4	47.2	42.7	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.6		5.3	0.0	0.3	0.0	0.8	16.7	94.4	4.8	
Delay (s)		56.1		54.4	35.6	20.5	25.5	28.0	52.1	141.6	47.4	
Level of Service		E		D	D	C	C	C	D	F	D	
Approach Delay (s)		56.1			38.5			43.2			101.0	
Approach LOS		E			D			D			F	

Intersection Summary			
HCM Average Control Delay	67.2	HCM Level of Service	E
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	123.2	Sum of lost time (s)	21.2
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Candlelight
2: SR-905 WB Ramps & Caliente Ave

Horizon Year Baseline
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	117	6	50	864	1128	0	0	428	648
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6	4.6	4.2	4.6			4.6	
Lane Util. Factor					1.00	1.00	1.00	0.91			0.91	
Frt					1.00	0.85	1.00	1.00			0.91	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1778	1583	1770	5085			4626	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1778	1583	1770	5085			4626	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	127	7	54	939	1226	0	0	465	704
RTOR Reduction (vph)	0	0	0	0	0	48	0	0	0	0	225	0
Lane Group Flow (vph)	0	0	0	0	134	6	939	1226	0	0	944	0
Turn Type				Perm		Perm	Prot					
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					12.7	12.7	55.8	85.5			25.5	
Effective Green, g (s)					12.7	12.7	55.8	85.5			25.5	
Actuated g/C Ratio					0.12	0.12	0.52	0.80			0.24	
Clearance Time (s)					4.6	4.6	4.2	4.6			4.6	
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)					210	187	920	4048			1098	
v/s Ratio Prot							c0.53	0.24			c0.20	
v/s Ratio Perm					0.08	0.00						
v/c Ratio					0.64	0.03	1.02	0.30			1.16dr	
Uniform Delay, d1					45.2	41.9	25.8	2.9			39.2	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					6.2	0.1	35.0	0.2			8.8	
Delay (s)					51.4	42.0	60.8	3.1			48.1	
Level of Service					D	D	E	A			D	
Approach Delay (s)		0.0			48.7			28.1			48.1	
Approach LOS		A			D			C			D	

Intersection Summary			
HCM Average Control Delay	35.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	107.4	Sum of lost time (s)	13.4
Intersection Capacity Utilization	100.0%	ICU Level of Service	G
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Candlelight
3: SR-905 EB Ramps & Caliente Ave

Horizon Year Baseline
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1097	68	570	0	0	0	0	783	81	131	397	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1						4.1		3.7	4.1	
Lane Util. Factor	0.95	0.95						0.91		1.00	0.95	
Frt	1.00	0.90						0.99		1.00	1.00	
Flt Protected	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (prot)	1681	1570						5014		1770	3539	
Flt Permitted	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (perm)	1681	1570						5014		1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1192	74	620	0	0	0	0	851	88	142	432	0
RTOR Reduction (vph)	0	85	0	0	0	0	0	14	0	0	0	0
Lane Group Flow (vph)	977	824	0	0	0	0	0	925	0	142	432	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	48.9	48.9						20.9		7.3	31.9	
Effective Green, g (s)	48.9	48.9						20.9		7.3	31.9	
Actuated g/C Ratio	0.55	0.55						0.23		0.08	0.36	
Clearance Time (s)	4.1	4.1						4.1		3.7	4.1	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	924	863						1177		145	1268	
v/s Ratio Prot	c0.58	0.53						c0.18		c0.08	0.12	
v/s Ratio Perm												
v/c Ratio	1.06	0.96						0.79		0.98	0.34	
Uniform Delay, d1	20.1	19.0						32.0		40.8	20.9	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	46.0	20.3						3.5		67.7	0.2	
Delay (s)	66.0	39.4						35.5		108.4	21.0	
Level of Service	E	D						D		F	C	
Approach Delay (s)		53.2			0.0			35.5			42.7	
Approach LOS		D			A			D			D	

Intersection Summary			
HCM Average Control Delay	46.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	100.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Candlelight
4: Airway Rd & Caliente Ave

Horizon Year Baseline
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	860	19	34	106	43	572	59	728	124	296	657	1070
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	935	21	37	115	47	622	64	791	135	322	714	1163

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	623	369	162	622	460	530	1036	1163
Volume Left (vph)	623	312	115	0	64	0	322	0
Volume Right (vph)	0	37	0	622	0	135	0	1163
Hadj (s)	0.53	0.39	0.39	-0.67	0.10	-0.14	0.19	-0.67
Departure Headway (s)	11.2	11.1	11.8	10.8	10.8	10.6	10.9	10.1
Degree Utilization, x	1.95	1.14	0.53	1.86	1.38	1.56	3.14	3.25
Capacity (veh/h)	325	335	295	338	341	352	341	370
Control Delay (s)	461.4	125.7	26.4	423.5	217.5	290.4	990.8	1038.5
Approach Delay (s)	336.5		341.4		256.5		1016.0	
Approach LOS	F		F		F		F	

Intersection Summary			
Delay	622.3		
HCM Level of Service	F		
Intersection Capacity Utilization	118.8%	ICU Level of Service	H
Analysis Period (min)	15		

1: Otay Mesa Rd & Caliente Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰↰	↑↑	↱	↰	↑↑	↱	↰↰	↑↱	
Volume (vph)	0	32	0	1398	86	834	4	683	461	602	338	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		5.2	6.7	5.2	5.2	5.6	5.6	5.2	5.6	
Lane Util. Factor		0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frt		1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3539		3433	3539	1583	1770	3539	1583	3433	3539	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3539		3433	3539	1583	1770	3539	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	35	0	1520	93	907	4	742	501	654	367	0
RTOR Reduction (vph)	0	0	0	0	0	29	0	0	317	0	0	0
Lane Group Flow (vph)	0	35	0	1520	93	878	4	742	184	654	367	0
Turn Type	Perm		Perm	Prot		pm+ov	Prot		Perm	Prot		
Protected Phases		2		1	6	7	3	8		7	4	
Permitted Phases	2		2			6			8			
Actuated Green, G (s)		6.8		38.8	48.1	67.9	49.8	49.4	49.4	19.8	19.4	
Effective Green, g (s)		6.8		38.8	48.1	67.9	49.8	49.4	49.4	19.8	19.4	
Actuated g/C Ratio		0.05		0.29	0.36	0.50	0.37	0.37	0.37	0.15	0.14	
Clearance Time (s)		4.0		5.2	6.7	5.2	5.2	5.6	5.6	5.2	5.6	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		179		988	1263	797	654	1297	580	504	509	
v/s Ratio Prot		0.01		c0.44	0.03	c0.16	0.00	c0.21		c0.19	0.10	
v/s Ratio Perm						0.39			0.12			
v/c Ratio		0.20		1.54	0.07	1.10	0.01	0.57	0.32	1.30	0.72	
Uniform Delay, d1		61.4		48.0	28.6	33.5	26.9	34.2	30.6	57.5	55.1	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.5		247.4	0.0	63.3	0.0	1.8	1.4	148.0	5.0	
Delay (s)		61.9		295.4	28.7	96.7	26.9	36.1	32.0	205.5	60.1	
Level of Service		E		F	C	F	C	D	C	F	E	
Approach Delay (s)		61.9			214.0			34.4			153.3	
Approach LOS		E			F			C			F	

Intersection Summary			
HCM Average Control Delay	153.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	134.8	Sum of lost time (s)	21.2
Intersection Capacity Utilization	95.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

2: SR-905 WB Ramps & Caliente Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↱	↰	↑↑↑			↑↑↱	
Volume (vph)	0	0	0	240	0	187	1249	1134	0	0	371	1231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6	4.6	4.2	4.6			4.6	
Lane Util. Factor					1.00	1.00	1.00	0.91			0.91	
Frt					1.00	0.85	1.00	1.00			0.88	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1770	1583	1770	5085			4499	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1770	1583	1770	5085			4499	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	261	0	203	1358	1233	0	0	403	1338
RTOR Reduction (vph)	0	0	0	0	0	131	0	0	0	0	170	0
Lane Group Flow (vph)	0	0	0	0	261	72	1358	1233	0	0	1571	0
Turn Type				Perm		Perm	Prot					
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					18.4	18.4	76.8	122.4			41.4	
Effective Green, g (s)					18.4	18.4	76.8	122.4			41.4	
Actuated g/C Ratio					0.12	0.12	0.51	0.82			0.28	
Clearance Time (s)					4.6	4.6	4.2	4.6			4.6	
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)					217	194	906	4149			1242	
v/s Ratio Prot							c0.77	0.24			c0.35	
v/s Ratio Perm					0.15	0.05						
v/c Ratio					1.20	0.37	1.50	0.30			2.18dr	
Uniform Delay, d1					65.8	60.5	36.6	3.4			54.3	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					126.7	1.2	230.3	0.2			125.7	
Delay (s)					192.5	61.7	266.9	3.5			180.0	
Level of Service					F	E	F	A			F	
Approach Delay (s)		0.0			135.3			141.6			180.0	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM Average Control Delay	154.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.39		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	116.6%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Candlelight
3: SR-905 EB Ramps & Caliente Ave

Horizon Year Baseline
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	⟲	⟲						⟲		⟲	⟲	
Volume (vph)	1129	29	430	0	0	0	0	1011	58	115	426	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1						4.1		3.7	4.1	
Lane Util. Factor	0.95	0.95						0.91		1.00	0.95	
Frt	1.00	0.92						0.99		1.00	1.00	
Flt Protected	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (prot)	1681	1589						5044		1770	3539	
Flt Permitted	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (perm)	1681	1589						5044		1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1227	32	467	0	0	0	0	1099	63	125	463	0
RTOR Reduction (vph)	0	52	0	0	0	0	0	7	0	0	0	0
Lane Group Flow (vph)	896	778	0	0	0	0	0	1155	0	125	463	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	48.9	48.9						21.9		7.3	32.9	
Effective Green, g (s)	48.9	48.9						21.9		7.3	32.9	
Actuated g/C Ratio	0.54	0.54						0.24		0.08	0.37	
Clearance Time (s)	4.1	4.1						4.1		3.7	4.1	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	913	863						1227		144	1294	
v/s Ratio Prot	c0.53	0.49						c0.23		c0.07	0.13	
v/s Ratio Perm												
v/c Ratio	0.98	0.90						0.94		0.87	0.36	
Uniform Delay, d1	20.1	18.4						33.4		40.9	20.8	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	25.1	12.5						13.9		38.7	0.2	
Delay (s)	45.2	31.0						47.4		79.5	21.0	
Level of Service	D	C						D		E	C	
Approach Delay (s)		38.4			0.0			47.4			33.4	
Approach LOS		D			A			D			C	

Intersection Summary			
HCM Average Control Delay	40.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	116.6%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Candlelight
4: Airway Rd & Caliente Ave

Horizon Year Baseline
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	⟲	⟲			⟲	⟲		⟲			⟲	⟲
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	1039	77	15	113	23	195	44	659	125	1066	504	939
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1129	84	16	123	25	212	48	716	136	1159	548	1021

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	753	476	148	212	406	494	1707	1021
Volume Left (vph)	753	376	123	0	48	0	1159	0
Volume Right (vph)	0	16	0	212	0	136	0	1021
Hadj (s)	0.53	0.41	0.45	-0.67	0.09	-0.16	0.37	-0.67
Departure Headway (s)	10.7	10.6	11.9	10.8	10.3	10.0	10.6	9.5
Degree Utilization, x	2.24	1.40	0.49	0.64	1.16	1.38	5.00	2.70
Capacity (veh/h)	343	349	293	326	354	367	346	388
Control Delay (s)	589.4	224.3	24.6	29.6	129.3	212.0	1826.7	791.2
Approach Delay (s)	447.9		27.6		174.7		1439.2	
Approach LOS	F		D		F		F	

Intersection Summary			
Delay	890.0		
HCM Level of Service	F		
Intersection Capacity Utilization	156.9%	ICU Level of Service	H
Analysis Period (min)	15		

Candlelight
1: Otay Mesa Rd & Caliente Ave

Horizon Year Plus Project
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	48	2	397	21	337	19	467	842	873	667	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	5.2	6.7	5.2	5.2	5.6	5.6	5.2	5.6	
Lane Util. Factor		0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3539	1583	3433	3539	1583	1770	3539	1583	3433	3539	
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3539	1583	3433	3539	1583	1770	3539	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	52	2	432	23	366	21	508	915	949	725	0
RTOR Reduction (vph)	0	0	2	0	0	107	0	0	349	0	0	0
Lane Group Flow (vph)	0	52	0	432	23	259	21	508	566	949	725	0
Turn Type	Prot		Perm	Prot		pm+ov	Prot		Perm	Prot		
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)		7.2	7.2	20.3	30.0	55.8	41.9	47.1	47.1	25.8	31.0	
Effective Green, g (s)		7.2	7.2	20.3	30.0	55.8	41.9	47.1	47.1	25.8	31.0	
Actuated g/C Ratio		0.06	0.06	0.17	0.25	0.46	0.35	0.39	0.39	0.21	0.26	
Clearance Time (s)		4.0	4.0	5.2	6.7	5.2	5.2	5.6	5.6	5.2	5.6	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		212	95	579	882	734	616	1384	619	736	911	
v/s Ratio Prot		0.01		c0.13	0.01	c0.08	0.01	0.14		c0.28	0.20	
v/s Ratio Perm			0.00			0.09			c0.36			
v/c Ratio		0.25	0.00	0.75	0.03	0.35	0.03	0.37	0.91	1.29	0.80	
Uniform Delay, d1		54.0	53.2	47.6	34.2	20.7	25.9	26.1	34.7	47.3	41.7	
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		0.6	0.0	5.2	0.0	0.3	0.1	0.8	20.4	140.3	4.9	
Delay (s)		54.6	53.2	52.8	34.2	21.0	26.0	26.8	55.1	187.6	46.6	
Level of Service		D	D	D	C	C	C	C	E	F	D	
Approach Delay (s)		54.6			38.1			44.7			126.6	
Approach LOS		D			D			D			F	

Intersection Summary			
HCM Average Control Delay	77.8	HCM Level of Service	E
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	120.4	Sum of lost time (s)	21.2
Intersection Capacity Utilization	92.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Candlelight
2: SR-905 WB Ramps & Caliente Ave

Horizon Year Plus Project
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	132	6	50	889	1203	0	0	447	648
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6	4.6	4.2	4.6			4.6	
Lane Util. Factor					1.00	1.00	1.00	0.91			0.91	
Frt					1.00	0.85	1.00	1.00			0.91	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1778	1583	1770	5085			4634	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1778	1583	1770	5085			4634	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	143	7	54	966	1308	0	0	486	704
RTOR Reduction (vph)	0	0	0	0	0	48	0	0	0	0	216	0
Lane Group Flow (vph)	0	0	0	0	150	6	966	1308	0	0	974	0
Turn Type				Perm		Perm	Prot					
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					13.7	13.7	64.8	95.4			26.4	
Effective Green, g (s)					13.7	13.7	64.8	95.4			26.4	
Actuated g/C Ratio					0.12	0.12	0.55	0.81			0.22	
Clearance Time (s)					4.6	4.6	4.2	4.6			4.6	
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)					206	183	970	4101			1034	
v/s Ratio Prot							c0.55	0.26			c0.21	
v/s Ratio Perm					0.08	0.00						
v/c Ratio					0.73	0.03	1.00	0.32			1.22dr	
Uniform Delay, d1					50.5	46.4	26.6	3.0			45.2	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					12.1	0.1	27.7	0.2			17.1	
Delay (s)					62.6	46.5	54.3	3.2			62.3	
Level of Service					E	D	D	A			E	
Approach Delay (s)		0.0			58.3			24.9			62.3	
Approach LOS		A			E			C			E	

Intersection Summary			
HCM Average Control Delay	38.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	118.3	Sum of lost time (s)	13.4
Intersection Capacity Utilization	103.9%	ICU Level of Service	G
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

3: SR-905 EB Ramps & Caliente Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1097	68	576	0	0	0	0	883	141	131	431	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1						4.1		3.7	4.1	
Lane Util. Factor	0.95	0.95						0.91		1.00	0.95	
Frt	1.00	0.90						0.98		1.00	1.00	
Flt Protected	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (prot)	1681	1570						4980		1770	3539	
Flt Permitted	0.95	0.99						1.00		0.95	1.00	
Satd. Flow (perm)	1681	1570						4980		1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1192	74	626	0	0	0	0	960	153	142	468	0
RTOR Reduction (vph)	0	87	0	0	0	0	0	24	0	0	0	0
Lane Group Flow (vph)	977	828	0	0	0	0	0	1089	0	142	468	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	48.9	48.9						21.9		7.3	32.9	
Effective Green, g (s)	48.9	48.9						21.9		7.3	32.9	
Actuated g/C Ratio	0.54	0.54						0.24		0.08	0.37	
Clearance Time (s)	4.1	4.1						4.1		3.7	4.1	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	913	853						1212		144	1294	
v/s Ratio Prot	c0.58	0.53						c0.22		c0.08	0.13	
v/s Ratio Perm												
v/c Ratio	1.07	0.97						0.90		0.99	0.36	
Uniform Delay, d1	20.6	19.9						33.0		41.3	20.9	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	50.4	23.8						9.0		70.2	0.2	
Delay (s)	70.9	43.7						42.0		111.5	21.0	
Level of Service	E	D						D		F	C	
Approach Delay (s)		57.7			0.0			42.0			42.1	
Approach LOS		E			A			D			D	

Intersection Summary			
HCM Average Control Delay	50.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	103.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

4: Airway Rd & Caliente Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	860	19	39	116	43	572	77	819	164	296	680	1070
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	4.0	
Lane Util. Factor	0.95	0.95		0.97	0.95	1.00	0.97	0.91		0.97	0.91	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.97		1.00	0.91	
Flt Protected	0.95	0.96		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1674		3433	3539	1583	3433	4958		3433	4619	
Flt Permitted	0.95	0.96		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1674		3433	3539	1583	3433	4958		3433	4619	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	935	21	42	126	47	622	84	890	178	322	739	1163
RTOR Reduction (vph)	0	2	0	0	0	121	0	22	0	0	203	0
Lane Group Flow (vph)	505	491	0	126	47	501	84	1046	0	322	1699	0
Turn Type	Split			Split		Perm	Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	37.0	37.0		36.0	36.0	36.0	4.0	35.4		15.6	47.0	
Effective Green, g (s)	37.0	37.0		36.0	36.0	36.0	4.0	35.4		15.6	47.0	
Actuated g/C Ratio	0.26	0.26		0.26	0.26	0.26	0.03	0.25		0.11	0.34	
Clearance Time (s)	4.0	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	3.0	
Lane Grp Cap (vph)	444	442		883	910	407	98	1254		383	1551	
v/s Ratio Prot	c0.30	0.29		0.04	0.01		0.02	0.21		c0.09	c0.37	
v/s Ratio Perm						c0.32						
v/c Ratio	1.14	1.11		0.14	0.05	1.23	0.86	0.83		0.84	1.58dr	
Uniform Delay, d1	51.5	51.5		40.1	39.1	52.0	67.7	49.5		61.0	46.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	86.0	76.3		0.1	0.0	123.6	48.0	4.9		15.2	53.5	
Delay (s)	137.5	127.8		40.2	39.2	175.6	115.7	54.5		76.2	100.0	
Level of Service	F	F		D	D	F	F	D		E	F	
Approach Delay (s)		132.7			146.1			58.9			96.6	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM Average Control Delay	102.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.4%	ICU Level of Service	E
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Candlelight
5: Public Street A & Caliente Ave

Horizon Year Plus Project
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	0	0	4	0	160	0	811	1	40	726	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	0	0	4	0	174	0	882	1	43	789	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			TWLTL	
Median storage veh)											2	
Upstream signal (ft)											512	
pX, platoon unblocked	0.67	0.67	0.67	0.67	0.67		0.67					
vC, conflicting volume	1934	1761	792	1758	1764	882	795			883		
vC1, stage 1 conf vol	879	879		882	882							
vC2, stage 2 conf vol	1055	883		876	882							
vCu, unblocked vol	2152	1892	437	1887	1896	882	441			883		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	77	100	100	98	100	50	100			94		
cM capacity (veh/h)	86	222	413	226	234	345	745			766		

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	8	8	4	178	0	883	43	795
Volume Left	8	8	4	4	0	0	43	0
Volume Right	0	0	0	174	0	1	0	5
cSH	86	86	86	341	1700	1700	766	1700
Volume to Capacity	0.09	0.09	0.05	0.52	0.00	0.52	0.06	0.47
Queue Length 95th (ft)	7	7	4	72	0	0	5	0
Control Delay (s)	51.2	51.2	49.1	26.6	0.0	0.0	10.0	0.0
Lane LOS	F	F	E	D			A	
Approach Delay (s)	50.8			26.6	0.0		0.5	
Approach LOS	F			D				

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		

Candlelight
1: Otay Mesa Rd & Caliente Ave

Horizon Year Plus Project
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	32	9	1448	86	834	8	689	483	602	352	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	5.2	6.7	5.2	5.2	5.6	5.6	5.2	5.6	
Lane Util. Factor		0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3539	1583	3433	3539	1583	1770	3539	1583	3433	3539	
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3539	1583	3433	3539	1583	1770	3539	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	35	10	1574	93	907	9	749	525	654	383	0
RTOR Reduction (vph)	0	0	10	0	0	89	0	0	332	0	0	0
Lane Group Flow (vph)	0	35	0	1574	93	818	9	749	193	654	383	0
Turn Type	Prot		Perm	Prot		pm+ov	Prot		Perm	Prot		
Protected Phases	5	2		1	6	7	3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)		6.8	6.8	38.8	48.1	68.9	50.9	50.4	50.4	20.8	20.3	
Effective Green, g (s)		6.8	6.8	38.8	48.1	68.9	50.9	50.4	50.4	20.8	20.3	
Actuated g/C Ratio		0.05	0.05	0.28	0.35	0.50	0.37	0.37	0.37	0.15	0.15	
Clearance Time (s)		4.0	4.0	5.2	6.7	5.2	5.2	5.6	5.6	5.2	5.6	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		176	79	974	1244	797	659	1304	583	522	525	
v/s Ratio Prot		0.01		c0.46	0.03	c0.16	0.01	c0.21		c0.19	0.11	
v/s Ratio Perm			0.00			0.36			0.12			
v/c Ratio		0.20	0.01	1.62	0.07	1.03	0.01	0.57	0.33	1.25	0.73	
Uniform Delay, d1		62.4	61.8	49.0	29.5	34.0	27.1	34.6	31.1	58.0	55.6	
Progression Factor		1.00	1.00	1.00	1.00	1.30	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.6	0.0	282.0	0.0	38.8	0.0	1.8	1.5	128.9	5.0	
Delay (s)		62.9	61.8	331.0	29.6	72.8	27.1	36.5	32.6	186.9	60.7	
Level of Service		E	E	F	C	E	C	D	C	F	E	
Approach Delay (s)		62.7			229.1			34.8			140.3	
Approach LOS		E			F			C			F	

Intersection Summary			
HCM Average Control Delay	158.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	136.8	Sum of lost time (s)	21.2
Intersection Capacity Utilization	97.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Candlelight
2: SR-905 WB Ramps & Caliente Ave

Horizon Year Plus Project
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					↰	↱	↰	↑↑↑			↑↑↱	
Volume (vph)	0	0	0	299	0	187	1260	1166	0	0	445	1231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6	4.6	4.2	4.6			4.6	
Lane Util. Factor					1.00	1.00	1.00	0.91			0.91	
Frt					1.00	0.85	1.00	1.00			0.89	
Flt Protected					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)					1770	1583	1770	5085			4525	
Flt Permitted					0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)					1770	1583	1770	5085			4525	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	325	0	203	1370	1267	0	0	484	1338
RTOR Reduction (vph)	0	0	0	0	0	115	0	0	0	0	191	0
Lane Group Flow (vph)	0	0	0	0	325	88	1370	1267	0	0	1631	0
Turn Type				Perm		Perm	Prot					
Protected Phases					8		5	2			6	
Permitted Phases				8		8						
Actuated Green, G (s)					21.4	21.4	72.8	119.4			42.4	
Effective Green, g (s)					21.4	21.4	72.8	119.4			42.4	
Actuated g/C Ratio					0.14	0.14	0.49	0.80			0.28	
Clearance Time (s)					4.6	4.6	4.2	4.6			4.6	
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)					253	226	859	4048			1279	
v/s Ratio Prot							c0.77	0.25			c0.36	
v/s Ratio Perm					0.18	0.06						
v/c Ratio					1.28	0.39	1.59	0.31			2.07dr	
Uniform Delay, d1					64.3	58.4	38.6	4.2			53.8	
Progression Factor					1.00	1.00	1.00	1.00			1.00	
Incremental Delay, d2					154.7	1.1	273.2	0.2			130.1	
Delay (s)					219.0	59.5	311.8	4.4			183.9	
Level of Service					F	E	F	A			F	
Approach Delay (s)		0.0			157.6			164.1			183.9	
Approach LOS		A			F			F			F	

Intersection Summary			
HCM Average Control Delay	170.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.45		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	123.4%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Candlelight
3: SR-905 EB Ramps & Caliente Ave

Horizon Year Plus Project
Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	✥						↑↑↱		↰	↑↑	
Volume (vph)	1129	29	455	0	0	0	0	1053	83	115	559	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1						4.1		3.7	4.1	
Lane Util. Factor	0.95	0.95						0.91		1.00	0.95	
Frt	1.00	0.91						0.99		1.00	1.00	
Flt Protected	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (prot)	1681	1584						5030		1770	3539	
Flt Permitted	0.95	0.98						1.00		0.95	1.00	
Satd. Flow (perm)	1681	1584						5030		1770	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1227	32	495	0	0	0	0	1145	90	125	608	0
RTOR Reduction (vph)	0	57	0	0	0	0	0	10	0	0	0	0
Lane Group Flow (vph)	908	789	0	0	0	0	0	1225	0	125	608	0
Turn Type	Split									Prot		
Protected Phases	4	4						2		1	6	
Permitted Phases												
Actuated Green, G (s)	47.9	47.9						23.9		6.3	33.9	
Effective Green, g (s)	47.9	47.9						23.9		6.3	33.9	
Actuated g/C Ratio	0.53	0.53						0.27		0.07	0.38	
Clearance Time (s)	4.1	4.1						4.1		3.7	4.1	
Vehicle Extension (s)	3.0	3.0						3.0		3.0	3.0	
Lane Grp Cap (vph)	895	843						1336		124	1333	
v/s Ratio Prot	c0.54	0.50						c0.24		c0.07	0.17	
v/s Ratio Perm												
v/c Ratio	1.01	0.94						0.92		1.01	0.46	
Uniform Delay, d1	21.1	19.6						32.1		41.9	21.1	
Progression Factor	1.00	1.00						1.00		1.00	1.00	
Incremental Delay, d2	33.7	17.4						10.0		83.0	0.2	
Delay (s)	54.8	37.0						42.1		124.8	21.4	
Level of Service	D	D						D		F	C	
Approach Delay (s)		46.2			0.0			42.1			39.0	
Approach LOS		D			A			D			D	

Intersection Summary			
HCM Average Control Delay	43.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	123.4%	ICU Level of Service	H
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)	1039	77	33	153	23	195	52	698	142	1066	594	939
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	4.0	
Lane Util. Factor	0.95	0.95		0.97	0.95	1.00	0.97	0.91		0.97	0.91	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.97		1.00	0.91	
Flt Protected	0.95	0.96		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1686		3433	3539	1583	3433	4957		3433	4618	
Flt Permitted	0.95	0.96		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1686		3433	3539	1583	3433	4957		3433	4618	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1129	84	36	166	25	212	57	759	154	1159	646	1021
RTOR Reduction (vph)	0	1	0	0	0	194	0	21	0	0	183	0
Lane Group Flow (vph)	621	627	0	166	25	18	57	892	0	1159	1484	0
Turn Type	Split			Split		Perm	Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	49.0	49.0		12.6	12.6	12.6	4.0	25.9		44.0	65.9	
Effective Green, g (s)	49.0	49.0		12.6	12.6	12.6	4.0	25.9		44.0	65.9	
Actuated g/C Ratio	0.33	0.33		0.09	0.09	0.09	0.03	0.18		0.30	0.45	
Clearance Time (s)	4.0	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	3.0	
Lane Grp Cap (vph)	558	560		293	302	135	93	870		1024	2063	
v/s Ratio Prot	0.37	c0.37		c0.05	0.01		0.02	c0.18		c0.34	0.32	
v/s Ratio Perm						0.01						
v/c Ratio	1.11	1.12		0.57	0.08	0.13	0.61	1.03		1.13	1.14dr	
Uniform Delay, d1	49.2	49.2		64.8	62.1	62.4	71.0	60.8		51.8	33.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	73.0	75.1		2.5	0.1	0.5	11.4	37.2		71.8	1.2	
Delay (s)	122.2	124.4		67.3	62.2	62.9	82.4	98.0		123.5	34.5	
Level of Service	F	F		E	E	E	F	F		F	C	
Approach Delay (s)		123.3			64.7			97.1			71.0	
Approach LOS		F			E			F			E	

Intersection Summary			
HCM Average Control Delay	87.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	147.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	0	0	2	0	68	0	744	4	158	574	18
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	0	0	2	0	74	0	809	4	172	624	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)											512	
pX, platoon unblocked	0.71	0.71	0.71	0.71	0.71		0.71					
vC, conflicting volume	1860	1790	634	1778	1798	811	643			813		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2005	1907	284	1891	1918	811	297			813		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	59	100	100	93	100	81	100			79		
cM capacity (veh/h)	21	38	538	32	38	379	900			814		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	9	76	0	813	172	643
Volume Left	9	2	0	0	172	0
Volume Right	0	74	0	4	0	20
cSH	21	289	1700	1700	814	1700
Volume to Capacity	0.41	0.26	0.00	0.48	0.21	0.38
Queue Length 95th (ft)	30	26	0	0	20	0
Control Delay (s)	262.5	21.8	0.0	0.0	10.6	0.0
Lane LOS	F	C			B	
Approach Delay (s)	262.5	21.8	0.0		2.2	
Approach LOS	F	C				

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		

Candlelight
Near Term Plus Project with Mitigations
1: Otay Mesa Rd & Caliente Ave
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰↰	↑↑	↱	↰	↑↑	↱	↰↰	↑↱	
Volume (vph)	0	2	0	328	10	115	10	355	655	288	488	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		5.2	6.7	5.2	5.2	5.6	5.2	5.2	5.6	
Lane Util. Factor		0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frt		1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3539		3433	3539	1583	1770	3539	1583	3433	3539	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3539		3433	3539	1583	1770	3539	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.85	0.85	0.85	0.75	0.75	0.75	0.76	0.76	0.76
Adj. Flow (vph)	0	2	0	386	12	135	13	473	873	379	642	0
RTOR Reduction (vph)	0	0	0	0	0	79	0	0	217	0	0	0
Lane Group Flow (vph)	0	2	0	386	12	56	13	473	656	379	642	0
Turn Type	Prot		Perm	Prot		pm+ov	Prot		pm+ov	Prot		
Protected Phases	5	2		1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)		5.6		21.3	29.4	46.0	37.7	47.2	68.5	16.6	26.1	
Effective Green, g (s)		5.6		21.3	29.4	46.0	37.7	47.2	68.5	16.6	26.1	
Actuated g/C Ratio		0.05		0.19	0.27	0.42	0.34	0.43	0.62	0.15	0.24	
Clearance Time (s)		4.0		5.2	6.7	5.2	5.2	5.6	5.2	5.2	5.6	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		179		661	940	658	603	1509	980	515	834	
v/s Ratio Prot		0.00		0.11	0.00	c0.01	0.01	0.13	c0.13	0.11	c0.18	
v/s Ratio Perm						0.02			0.29			
v/c Ratio		0.01		0.58	0.01	0.09	0.02	0.31	0.67	0.74	0.77	
Uniform Delay, d1		49.9		40.7	30.0	19.6	24.2	21.0	13.7	45.0	39.5	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0		1.3	0.0	0.1	0.1	0.5	1.7	5.4	4.3	
Delay (s)		49.9		42.0	30.0	19.7	24.3	21.6	15.5	50.4	43.8	
Level of Service		D		D	C	B	C	C	B	D	D	
Approach Delay (s)		49.9			36.1			17.7			46.3	
Approach LOS		D			D			B			D	

Intersection Summary			
HCM Average Control Delay	31.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	110.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Candlelight
Near Term Plus Project with Mitigations
4: Airway Rd & Caliente Ave
Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	✥		↰↰	↑↑	↱	↰↰	↑↑↱		↰↰	↑↑↱	
Volume (vph)	411	7	24	0	17	113	57	303	0	46	177	479
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			0.95	1.00	0.97	0.91		0.97	0.91	
Frt	1.00	0.98			1.00	0.85	1.00	1.00		1.00	0.89	
Flt Protected	0.95	0.96			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1669			3539	1583	3433	5085		3433	4528	
Flt Permitted	0.95	0.96			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1669			3539	1583	3433	5085		3433	4528	
Peak-hour factor, PHF	0.74	0.92	0.74	0.92	0.92	0.92	0.58	0.58	0.92	0.92	0.72	0.72
Adj. Flow (vph)	555	8	32	0	18	123	98	522	0	50	246	665
RTOR Reduction (vph)	0	6	0	0	0	111	0	0	0	0	505	0
Lane Group Flow (vph)	300	289	0	0	18	12	98	522	0	50	406	0
Turn Type	Split			Split		Perm	Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	14.4	14.4			4.9	4.9	2.9	13.0		2.0	12.1	
Effective Green, g (s)	14.4	14.4			4.9	4.9	2.9	13.0		2.0	12.1	
Actuated g/C Ratio	0.29	0.29			0.10	0.10	0.06	0.26		0.04	0.24	
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)	481	478			345	154	198	1314		137	1089	
v/s Ratio Prot	c0.18	0.17			0.01		c0.03	c0.10		0.01	0.09	
v/s Ratio Perm						c0.01						
v/c Ratio	0.62	0.61			0.05	0.08	0.49	0.40		0.36	0.37	
Uniform Delay, d1	15.6	15.5			20.6	20.6	23.0	15.4		23.5	15.9	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.5	2.2			0.1	0.2	1.9	0.2		1.7	0.2	
Delay (s)	18.1	17.7			20.7	20.9	24.9	15.6		25.2	16.2	
Level of Service	B	B			C	C	C	B		C	B	
Approach Delay (s)		17.9			20.8			17.1			16.6	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM Average Control Dela	17.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	50.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

1: Otay Mesa Rd & Caliente Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰↰	↑↑	↱	↰	↑↑	↱	↰↰	↑↱	
Volume (vph)	0	1	0	1062	30	225	4	686	360	225	287	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		5.2	6.7	5.2	5.2	5.6	5.2	5.2	5.6	
Lane Util. Factor		0.95		0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frt		1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3539		3433	3539	1583	1770	3539	1583	3433	3539	
Flt Permitted		1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3539		3433	3539	1583	1770	3539	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.73	0.73	0.73	0.84	0.84	0.84	0.91	0.91	0.91
Adj. Flow (vph)	0	1	0	1455	41	308	5	817	429	247	315	0
RTOR Reduction (vph)	0	0	0	0	0	48	0	0	69	0	0	0
Lane Group Flow (vph)	0	1	0	1455	41	260	5	817	360	247	315	0
Turn Type	Prot		Perm	Prot		pm+ov	Prot		pm+ov	Prot		
Protected Phases	5	2		1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)		4.1		59.1	65.7	78.9	43.0	48.2	107.3	13.2	18.4	
Effective Green, g (s)		4.1		59.1	65.7	78.9	43.0	48.2	107.3	13.2	18.4	
Actuated g/C Ratio		0.03		0.41	0.45	0.55	0.30	0.33	0.74	0.09	0.13	
Clearance Time (s)		4.0		5.2	6.7	5.2	5.2	5.6	5.2	5.2	5.6	
Vehicle Extension (s)		3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		100		1403	1608	864	526	1180	1175	313	450	
v/s Ratio Prot		0.00		c0.42	0.01	c0.03	0.00	c0.23	0.13	0.07	c0.09	
v/s Ratio Perm						0.14			0.10			
v/c Ratio		0.01		1.04	0.03	0.30	0.01	0.69	0.31	0.79	0.70	
Uniform Delay, d1		68.3		42.8	21.8	17.9	35.8	41.8	6.2	64.3	60.5	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.0		34.2	0.0	0.2	0.0	3.4	0.1	12.4	4.7	
Delay (s)		68.3		76.9	21.8	18.1	35.8	45.1	6.4	76.7	65.2	
Level of Service		E		E	C	B	D	D	A	E	E	
Approach Delay (s)		68.3			65.6			31.8			70.3	
Approach LOS		E			E			C			E	

Intersection Summary			
HCM Average Control Delay	54.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	144.6	Sum of lost time (s)	21.6
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

4: Airway Rd & Caliente Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↑↱		↰↰	↑↑	↱	↰↰	↑↑↑↱		↰↰	↑↑↑↱	
Volume (vph)	473	27	29	0	7	48	31	208	0	182	215	459
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			0.95	1.00	0.97	0.91		0.97	0.91	
Frt	1.00	0.98			1.00	0.85	1.00	1.00		1.00	0.90	
Flt Protected	0.95	0.96			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1681	1673			3539	1583	3433	5085		3433	4566	
Flt Permitted	0.95	0.96			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1681	1673			3539	1583	3433	5085		3433	4566	
Peak-hour factor, PHF	0.76	0.92	0.76	0.92	0.92	0.92	0.50	0.50	0.92	0.92	0.70	0.70
Adj. Flow (vph)	622	29	38	0	8	52	62	416	0	198	307	656
RTOR Reduction (vph)	0	6	0	0	0	49	0	0	0	0	457	0
Lane Group Flow (vph)	348	335	0	0	8	3	62	416	0	198	506	0
Turn Type	Split			Split		Perm	Prot			Prot		
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases						8						
Actuated Green, G (s)	15.4	15.4			3.4	3.4	2.1	12.9		5.3	16.1	
Effective Green, g (s)	15.4	15.4			3.4	3.4	2.1	12.9		5.3	16.1	
Actuated g/C Ratio	0.29	0.29			0.06	0.06	0.04	0.24		0.10	0.30	
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)	488	486			227	102	136	1238		343	1387	
v/s Ratio Prot	c0.21	0.20			c0.00		0.02	0.08		c0.06	c0.11	
v/s Ratio Perm						0.00						
v/c Ratio	0.71	0.69			0.04	0.03	0.46	0.34		0.58	0.37	
Uniform Delay, d1	16.8	16.7			23.3	23.3	24.9	16.5		22.8	14.4	
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.9	4.0			0.1	0.1	2.4	0.2		2.4	0.2	
Delay (s)	21.7	20.7			23.3	23.4	27.3	16.7		25.1	14.6	
Level of Service	C	C			C	C	C	B		C	B	
Approach Delay (s)		21.2			23.4			18.1			16.4	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	18.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	53.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

1: Otay Mesa Rd & Caliente Ave

Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	48	2	397	21	337	19	467	842	873	667	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	5.2	6.7	5.2	5.2	5.6	5.2	5.2	5.6	
Lane Util. Factor		0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3539	1583	3433	3539	1583	1770	3539	1583	3433	3539	
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3539	1583	3433	3539	1583	1770	3539	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	52	2	432	23	366	21	508	915	949	725	0
RTOR Reduction (vph)	0	0	2	0	0	68	0	0	60	0	0	0
Lane Group Flow (vph)	0	52	0	432	23	298	21	508	855	949	725	0
Turn Type	Prot		Perm	Prot		pm+ov	Prot		pm+ov	Prot		Perm
Protected Phases	5	2		1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)		5.6	5.6	38.1	46.2	72.7	19.7	20.6	58.7	26.5	27.4	
Effective Green, g (s)		5.6	5.6	38.1	46.2	72.7	19.7	20.6	58.7	26.5	27.4	
Actuated g/C Ratio		0.05	0.05	0.34	0.42	0.66	0.18	0.19	0.53	0.24	0.25	
Clearance Time (s)		4.0	4.0	5.2	6.7	5.2	5.2	5.6	5.2	5.2	5.6	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		179	80	1180	1476	1039	315	658	839	821	875	
v/s Ratio Prot		0.01		0.13	0.01	c0.07	0.01	0.14	c0.35	c0.28	0.20	
v/s Ratio Perm			0.00			0.12			0.19			
v/c Ratio		0.29	0.00	0.37	0.02	0.29	0.07	0.77	1.02	1.16	0.83	
Uniform Delay, d1		50.7	49.9	27.3	19.0	8.1	37.9	42.9	26.0	42.1	39.5	
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		0.9	0.0	0.2	0.0	0.2	0.1	5.6	36.0	83.8	6.5	
Delay (s)		51.6	50.0	27.5	19.0	8.2	38.0	48.5	62.1	125.9	46.0	
Level of Service		D	D	C	B	A	D	D	E	F	D	
Approach Delay (s)		51.5			18.7			56.9			91.3	
Approach LOS		D			B			E			F	

Intersection Summary			
HCM Average Control Delay	63.4	HCM Level of Service	E
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	110.8	Sum of lost time (s)	15.6
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

2: SR-905 WB Ramps & Caliente Ave

Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	132	6	50	889	1203	0	0	447	648
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6	4.6	4.2	4.6			4.6	4.6
Lane Util. Factor					1.00	1.00	0.97	0.95			0.95	0.88
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					1778	1583	3433	3539			3539	2787
Flt Permitted					0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)					1778	1583	3433	3539			3539	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	143	7	54	966	1308	0	0	486	704
RTOR Reduction (vph)	0	0	0	0	0	46	0	0	0	0	0	450
Lane Group Flow (vph)	0	0	0	0	150	8	966	1308	0	0	486	254
Turn Type				Perm		Perm	Prot					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)					11.1	11.1	20.8	50.5			25.5	25.5
Effective Green, g (s)					11.1	11.1	20.8	50.5			25.5	25.5
Actuated g/C Ratio					0.16	0.16	0.29	0.71			0.36	0.36
Clearance Time (s)					4.6	4.6	4.2	4.6			4.6	4.6
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					279	248	1009	2524			1275	1004
v/s Ratio Prot							c0.28	c0.37			0.14	
v/s Ratio Perm					0.08	0.01						0.09
v/c Ratio					0.54	0.03	0.96	0.52			0.38	0.25
Uniform Delay, d1					27.5	25.3	24.6	4.6			16.8	15.9
Progression Factor					1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2					2.0	0.1	18.7	0.8			0.9	0.6
Delay (s)					29.5	25.4	43.2	5.4			17.7	16.5
Level of Service					C	C	D	A			B	B
Approach Delay (s)		0.0			28.4			21.5			17.0	
Approach LOS		A			C			C			B	

Intersection Summary			
HCM Average Control Delay	20.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	70.8	Sum of lost time (s)	8.8
Intersection Capacity Utilization	103.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

5: Public Street A & Caliente Ave

Timing Plan: AM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣		↰	↑↱		↰	↑↱	
Volume (vph)	18	0	0	4	0	160	0	811	1	40	726	5
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			0.95		1.00	0.95	
Frt		1.00			0.87			1.00		1.00	1.00	
Flt Protected		0.95			1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1770			1615			3539		1770	3536	
Flt Permitted		0.73			0.99			1.00		0.95	1.00	
Satd. Flow (perm)		1355			1605			3539		1770	3536	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	0	0	4	0	174	0	882	1	43	789	5
RTOR Reduction (vph)	0	0	0	0	151	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	20	0	0	27	0	0	883	0	43	794	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		5.5			5.5			22.1		1.5	27.6	
Effective Green, g (s)		5.5			5.5			22.1		1.5	27.6	
Actuated g/C Ratio		0.13			0.13			0.54		0.04	0.67	
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)		181			215			1903		65	2375	
v/s Ratio Prot								c0.25		0.02	c0.22	
v/s Ratio Perm		0.01			c0.02							
v/c Ratio		0.11			0.13			0.46		0.66	0.33	
Uniform Delay, d1		15.6			15.7			5.9		19.5	2.9	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.3			0.3			0.2		22.5	0.1	
Delay (s)		15.9			16.0			6.0		42.0	2.9	
Level of Service		B			B			A		D	A	
Approach Delay (s)		15.9			16.0			6.0			4.9	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	41.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

1: Otay Mesa Rd & Caliente Ave

Timing Plan: PM PEAK

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰↰	↑↑	↱	↰	↑↑	↱	↰↰	↑↱	
Volume (vph)	0	32	9	1448	86	834	8	689	483	602	352	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	5.2	6.7	5.2	5.2	5.6	5.2	5.2	5.6	
Lane Util. Factor		0.95	1.00	0.97	0.95	1.00	1.00	0.95	1.00	0.97	0.95	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3539	1583	3433	3539	1583	1770	3539	1583	3433	3539	
Flt Permitted		1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		3539	1583	3433	3539	1583	1770	3539	1583	3433	3539	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	35	10	1574	93	907	9	749	525	654	383	0
RTOR Reduction (vph)	0	0	10	0	0	78	0	0	113	0	0	0
Lane Group Flow (vph)	0	35	0	1574	93	829	9	749	412	654	383	0
Turn Type	Prot		Perm	Prot		pm+ov	Prot		pm+ov	Prot		
Protected Phases	5	2		1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)		4.0	4.0	39.2	45.7	66.7	6.4	34.2	73.4	21.0	48.8	
Effective Green, g (s)		4.0	4.0	39.2	45.7	66.7	6.4	34.2	73.4	21.0	48.8	
Actuated g/C Ratio		0.03	0.03	0.33	0.39	0.56	0.05	0.29	0.62	0.18	0.41	
Clearance Time (s)		4.0	4.0	5.2	6.7	5.2	5.2	5.6	5.2	5.2	5.6	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		120	53	1137	1366	892	96	1022	981	609	1459	
v/s Ratio Prot		0.01		c0.46	0.03	c0.16	0.01	c0.21	0.14	c0.19	0.11	
v/s Ratio Perm			0.00			0.36			0.12			
v/c Ratio		0.29	0.01	1.38	0.07	0.93	0.09	0.73	0.42	1.07	0.26	
Uniform Delay, d1		55.8	55.3	39.6	22.9	23.7	53.2	38.0	11.6	48.7	22.9	
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		1.4	0.0	178.5	0.0	15.5	0.4	2.7	0.3	57.9	0.1	
Delay (s)		57.2	55.3	218.1	22.9	39.2	53.7	40.7	11.9	106.6	23.0	
Level of Service		E	E	F	C	D	D	D	B	F	C	
Approach Delay (s)		56.8			148.0			29.0			75.7	
Approach LOS		E			F			C			E	

Intersection Summary			
HCM Average Control Delay	101.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	118.4	Sum of lost time (s)	21.2
Intersection Capacity Utilization	97.5%	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)	0	0	0	299	0	187	1260	1166	0	0	445	1231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.6	4.6	4.2	4.6			4.6	4.6
Lane Util. Factor					1.00	1.00	0.97	0.95			0.95	0.88
Frt					1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected					0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)					1770	1583	3433	3539			3539	2787
Flt Permitted					0.95	1.00	0.95	1.00			1.00	1.00
Satd. Flow (perm)					1770	1583	3433	3539			3539	2787
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	325	0	203	1370	1267	0	0	484	1338
RTOR Reduction (vph)	0	0	0	0	0	94	0	0	0	0	0	417
Lane Group Flow (vph)	0	0	0	0	325	109	1370	1267	0	0	484	921
Turn Type				Perm		Perm	Prot					Perm
Protected Phases					8		5	2			6	
Permitted Phases				8		8						6
Actuated Green, G (s)					21.4	21.4	45.8	89.4			39.4	39.4
Effective Green, g (s)					21.4	21.4	45.8	89.4			39.4	39.4
Actuated g/C Ratio					0.18	0.18	0.38	0.75			0.33	0.33
Clearance Time (s)					4.6	4.6	4.2	4.6			4.6	4.6
Vehicle Extension (s)					3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)					316	282	1310	2637			1162	915
v/s Ratio Prot							c0.40	0.36			0.14	
v/s Ratio Perm					0.18	0.07						c0.33
v/c Ratio					1.03	0.38	1.05	0.48			0.42	1.01
Uniform Delay, d1					49.3	43.5	37.1	6.1			31.4	40.3
Progression Factor					1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2					58.2	0.9	37.7	0.6			1.1	31.3
Delay (s)					107.5	44.4	74.8	6.7			32.5	71.6
Level of Service					F	D	E	A			C	E
Approach Delay (s)		0.0			83.2			42.1			61.2	
Approach LOS		A			F			D			E	

Intersection Summary			
HCM Average Control Delay	53.4	HCM Level of Service	D
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	130.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

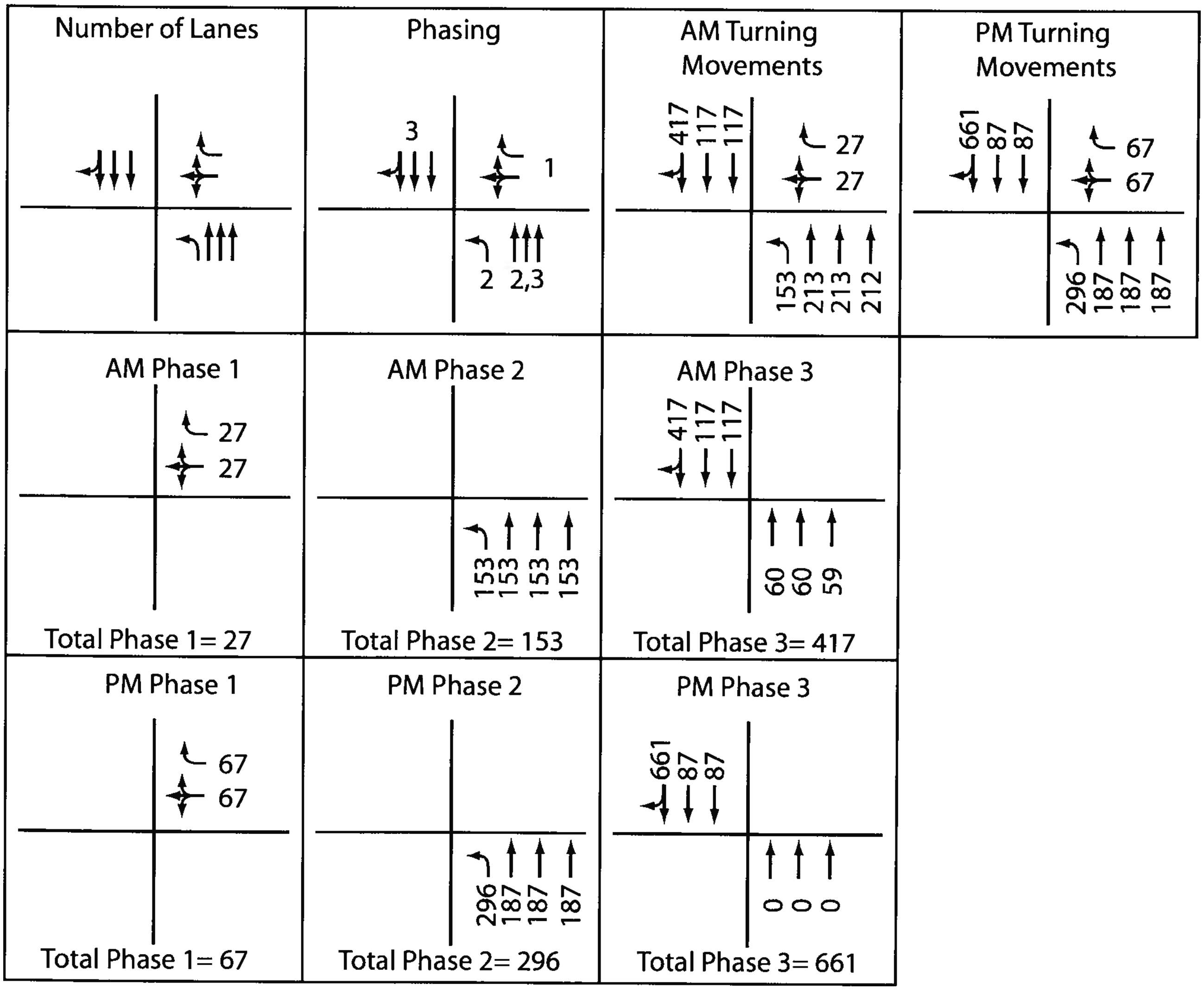
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↑↱		↰	↑↱	
Volume (vph)	8	0	0	2	0	68	0	744	4	158	574	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0			4.0	4.0			4.0		4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00			0.95		1.00	0.95	
Frt	1.00			1.00	0.85			1.00		1.00	1.00	
Flt Protected	0.95			0.95	1.00			1.00		0.95	1.00	
Satd. Flow (prot)	1770			1770	1583			3537		1770	3523	
Flt Permitted	1.00			1.00	1.00			1.00		0.95	1.00	
Satd. Flow (perm)	1863			1863	1583			3537		1770	3523	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	0	0	2	0	74	0	809	4	172	624	20
RTOR Reduction (vph)	0	0	0	0	69	0	0	1	0	0	2	0
Lane Group Flow (vph)	9	0	0	2	5	0	0	812	0	172	642	0
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	3.2			3.2	3.2			21.0		7.6	32.6	
Effective Green, g (s)	3.2			3.2	3.2			21.0		7.6	32.6	
Actuated g/C Ratio	0.07			0.07	0.07			0.48		0.17	0.74	
Clearance Time (s)	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	
Lane Grp Cap (vph)	136			136	116			1696		307	2622	
v/s Ratio Prot					0.00			c0.23		c0.10	0.18	
v/s Ratio Perm	c0.00			0.00								
v/c Ratio	0.07			0.01	0.05			0.48		0.56	0.24	
Uniform Delay, d1	18.9			18.8	18.9			7.7		16.6	1.8	
Progression Factor	1.00			1.00	1.00			1.00		1.00	1.00	
Incremental Delay, d2	0.2			0.0	0.2			0.2		2.3	0.0	
Delay (s)	19.1			18.9	19.0			7.9		18.9	1.8	
Level of Service	B			B	B			A		B	A	
Approach Delay (s)		19.1			19.0			7.9			5.4	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM Average Control Delay	7.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	43.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX D

- Intersection Lane Vehicle Analysis Worksheets

Intersection Name: Caliente Ave & SR-905 WB Ramps
Date: 10/17/2012
Scenario: Existing Baseline



AM TOTAL= 597

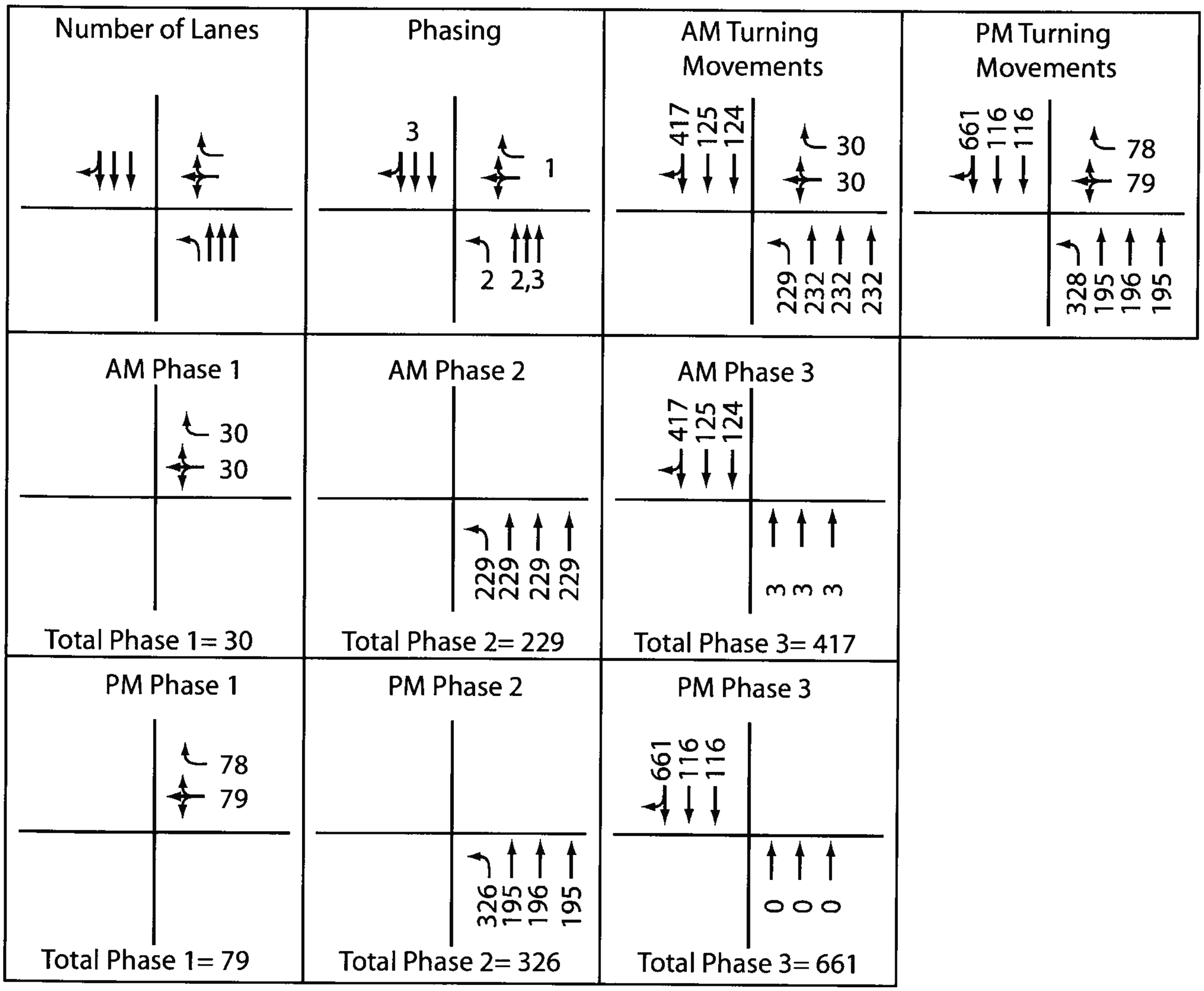
AM LOS= BELOW CAPACITY

PM TOTAL= 1024

PM LOS= BELOW CAPACITY

NOT TO SCALE

Intersection Name: Caliente Ave & SR-905 WB Ramps
Date: 10/17/2012
Scenario: Existing with Project

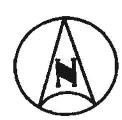


AM TOTAL= 676

AM LOS= BELOW CAPACITY

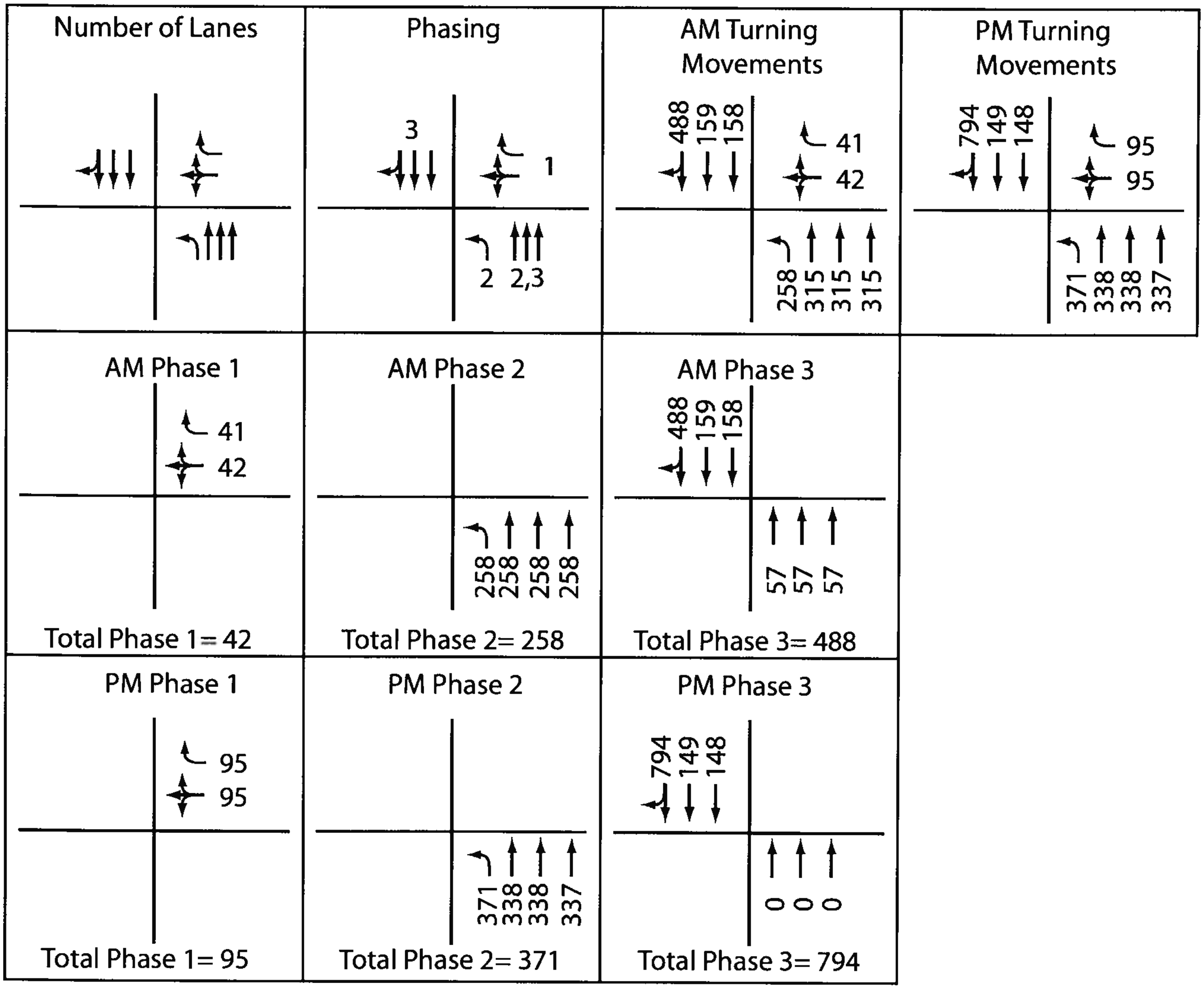
PM TOTAL= 1066

PM LOS= BELOW CAPACITY



NOT TO SCALE

Intersection Name: Caliente Ave & SR-905 WB Ramps
Date: 10/17/2012
Scenario: Near Term Baseline



AM TOTAL= 788

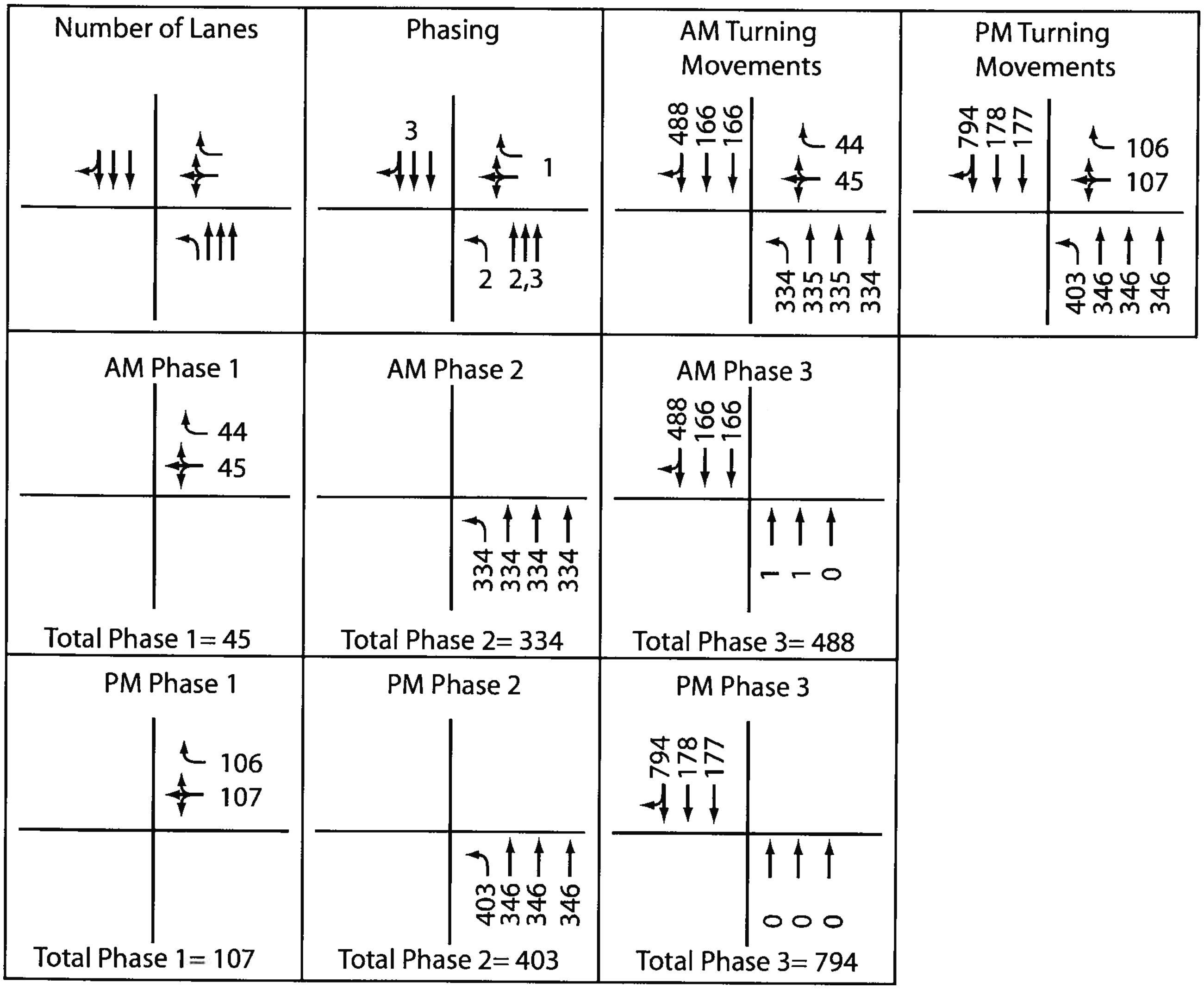
AM LOS= BELOW CAPACITY

PM TOTAL= 1260

PM LOS= APPROACHING CAPACITY

NOT TO SCALE

Intersection Name: Caliente Ave & SR-905 WB Ramps
Date: 10/17/2012
Scenario: Near Term with Project



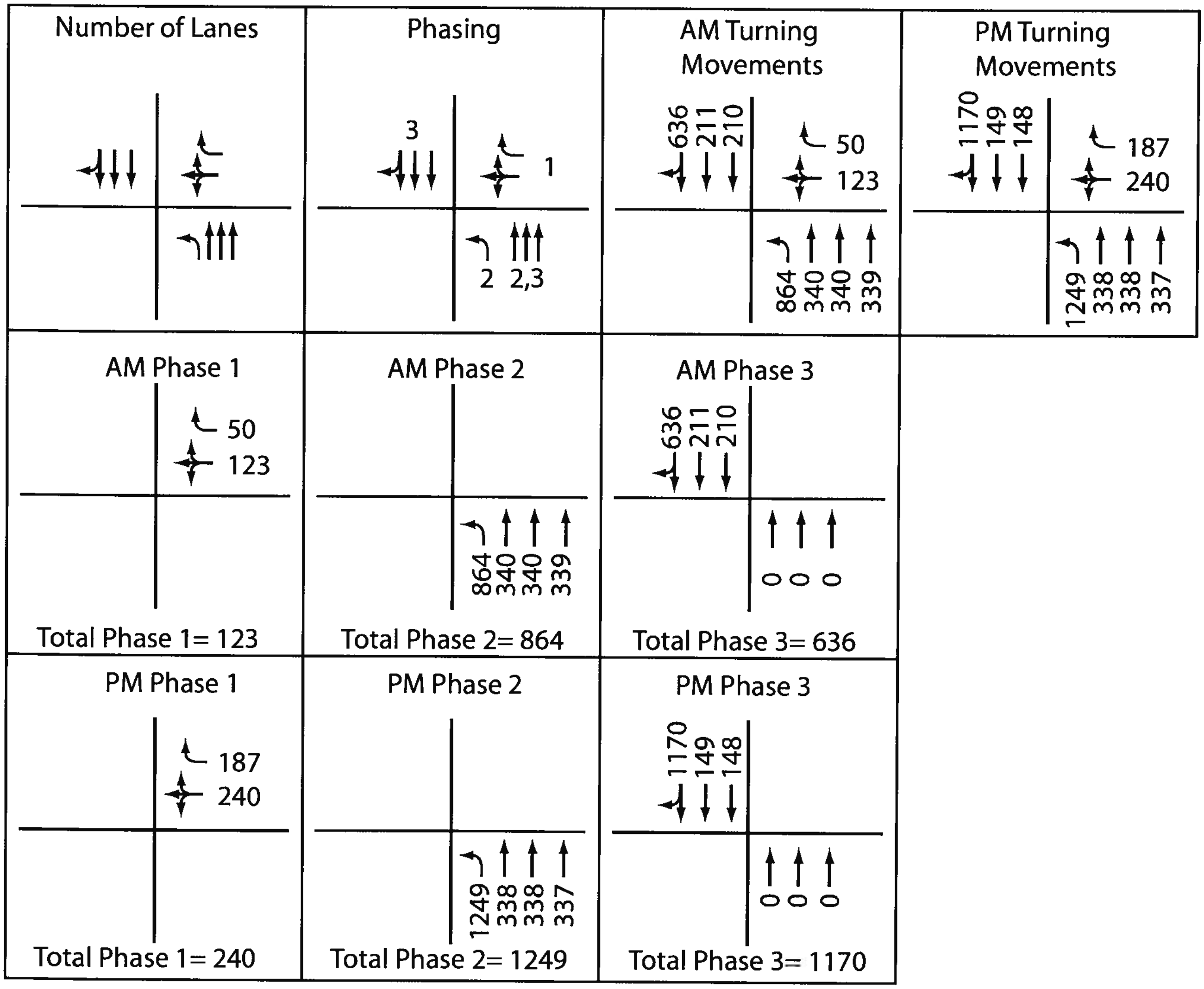
AM TOTAL= 867

AM LOS= BELOW CAPACITY

PM TOTAL= 1304

PM LOS= APPROACHING CAPACITY

Intersection Name: **Caliente Ave & SR-905 WB Ramps**
Date: **10/17/2012**
Scenario: **Horizon Year Baseline**



AM TOTAL= 1623

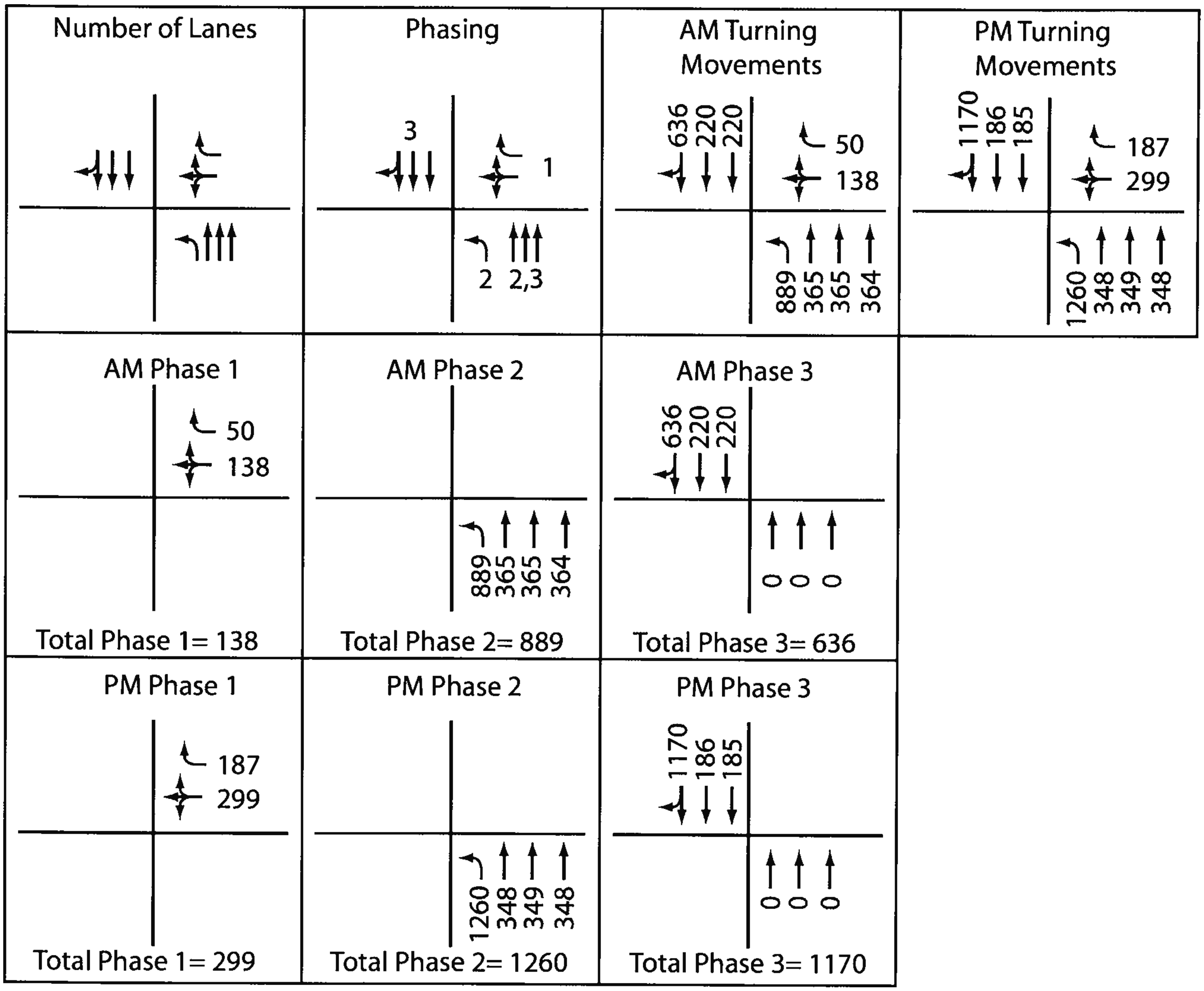
AM LOS= ABOVE CAPACITY

PM TOTAL= 2659

PM LOS= ABOVE CAPACITY

NOT TO SCALE

Intersection Name: Caliente Ave & SR-905 WB Ramps
Date: 10/17/2012
Scenario: Horizon Year with Project

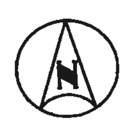


AM TOTAL= 1663

AM LOS= APPROACHING CAPACITY

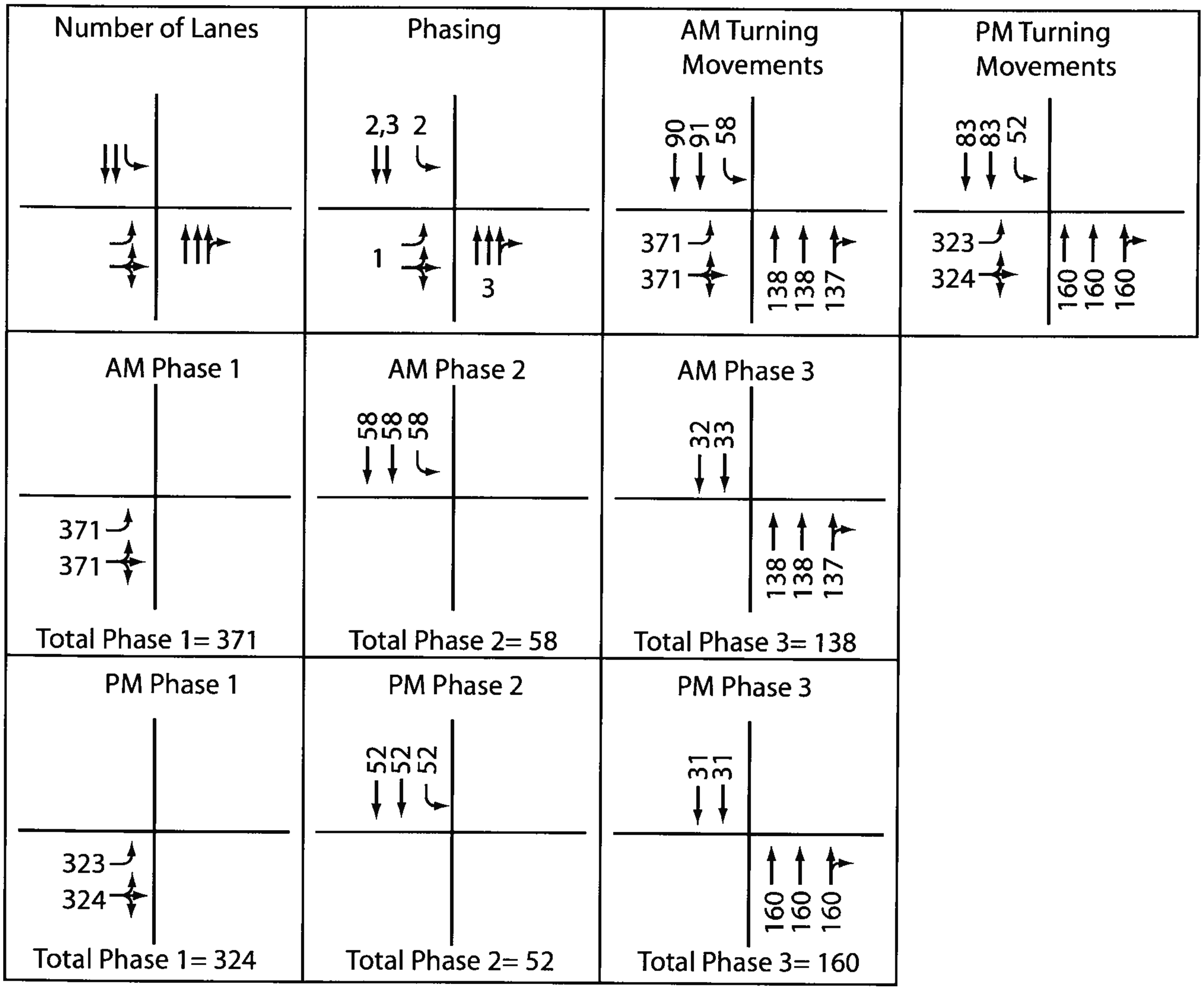
PM TOTAL= 2729

PM LOS= ABOVE CAPACITY



NOT TO SCALE

Intersection Name: Caliente Ave & SR-905 EB Ramps
Date: 10/17/2012
Scenario: Existing Baseline



AM TOTAL= 567

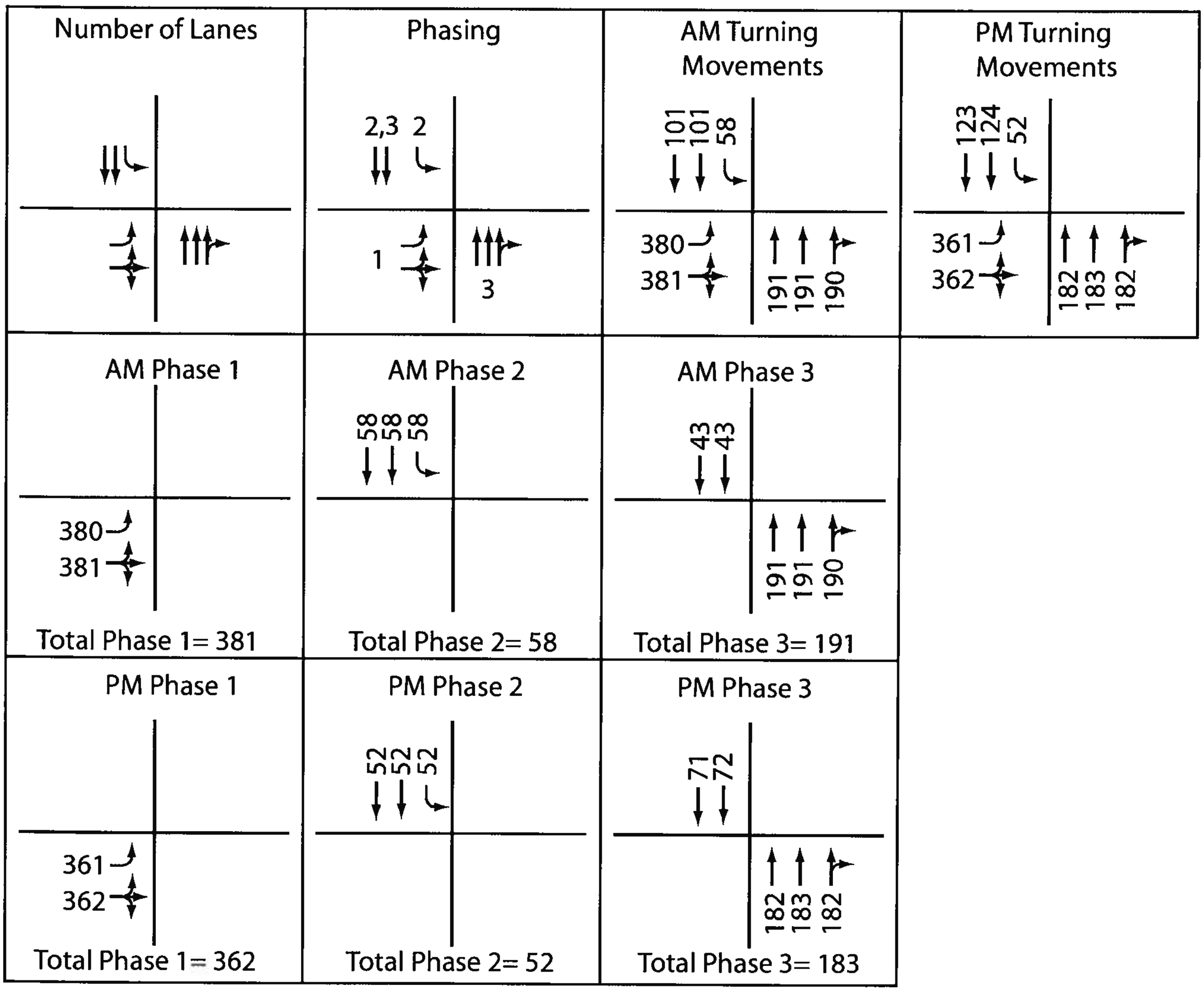
AM LOS= BELOW CAPACITY

PM TOTAL= 536

PM LOS= BELOW CAPACITY

NOT TO SCALE

Intersection Name: Caliente Ave & SR-905 EB Ramps
Date: 10/17/2012
Scenario: Existing Plus Project



AM TOTAL= 630

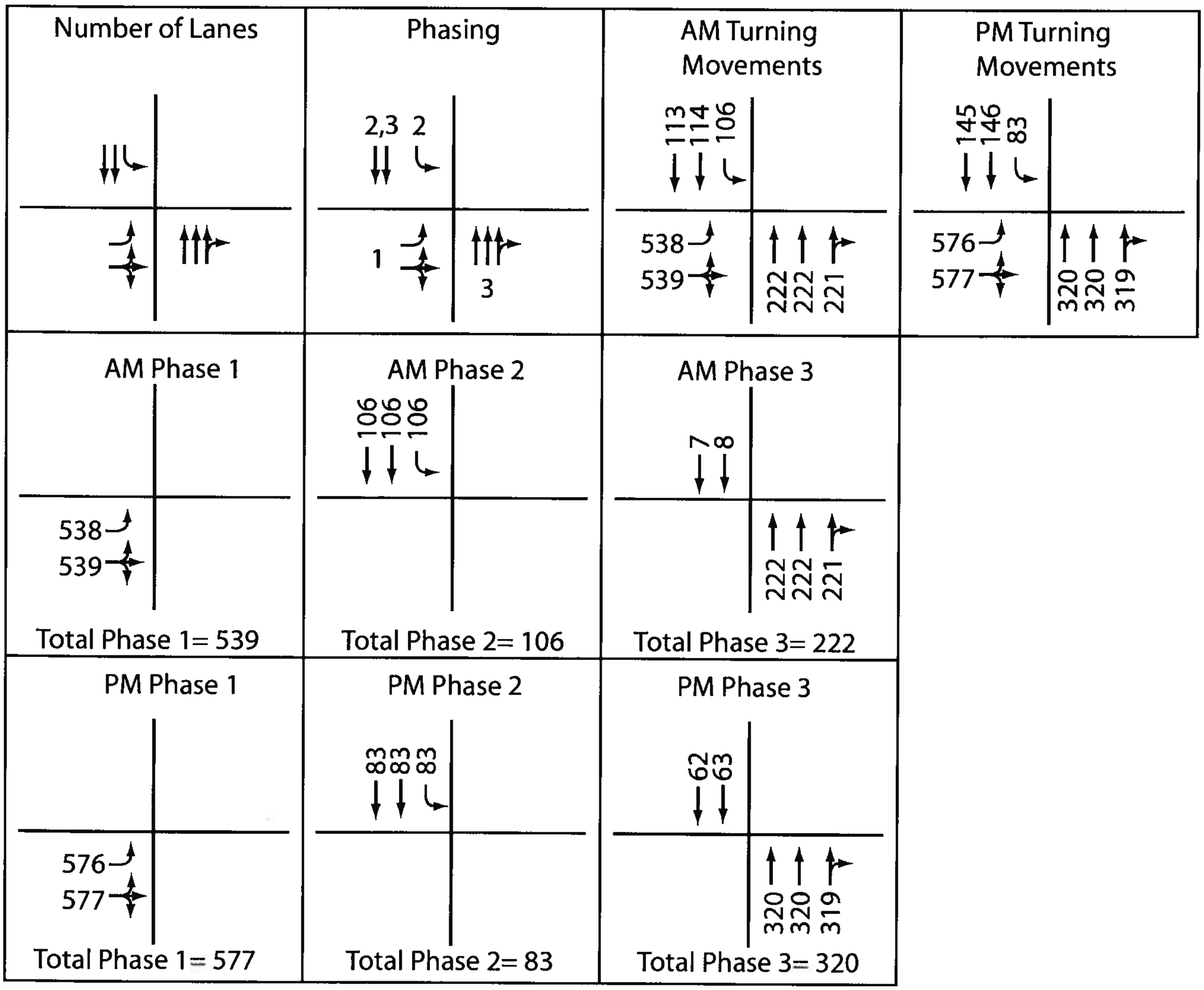
AM LOS= BELOW CAPACITY

PM TOTAL= 597

PM LOS= BELOW CAPACITY

NOT TO SCALE

Intersection Name: Caliente Ave & SR-905 EB Ramps
Date: 10/17/2012
Scenario: Near Term Baseline

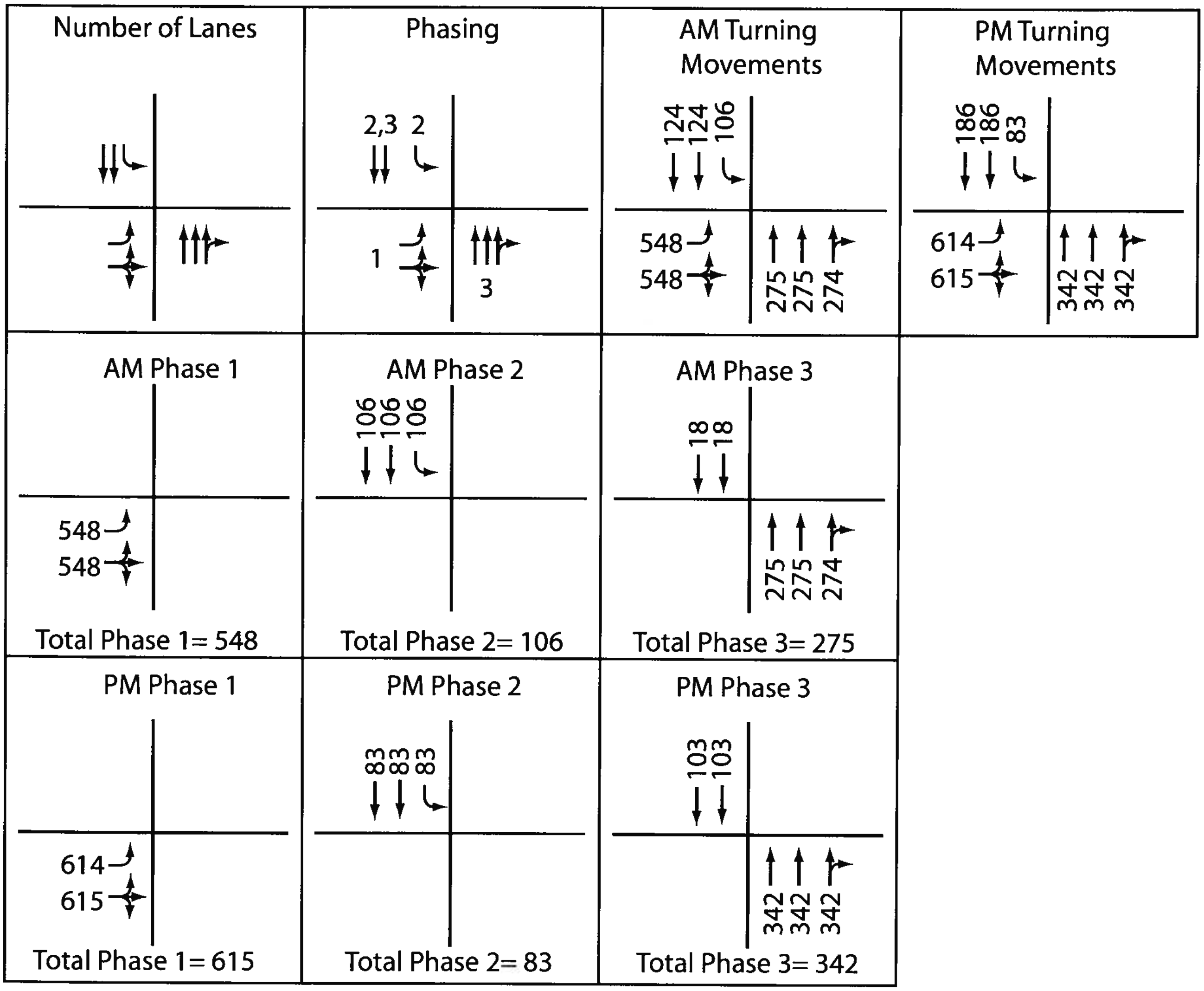


AM TOTAL= 867 AM LOS= BELOW CAPACITY

PM TOTAL= 980 PM LOS= BELOW CAPACITY

NOT TO SCALE

Intersection Name: Caliente Ave & SR-905 EB Ramps
Date: 10/17/2012
Scenario: Near Term with Project



AM TOTAL= 928

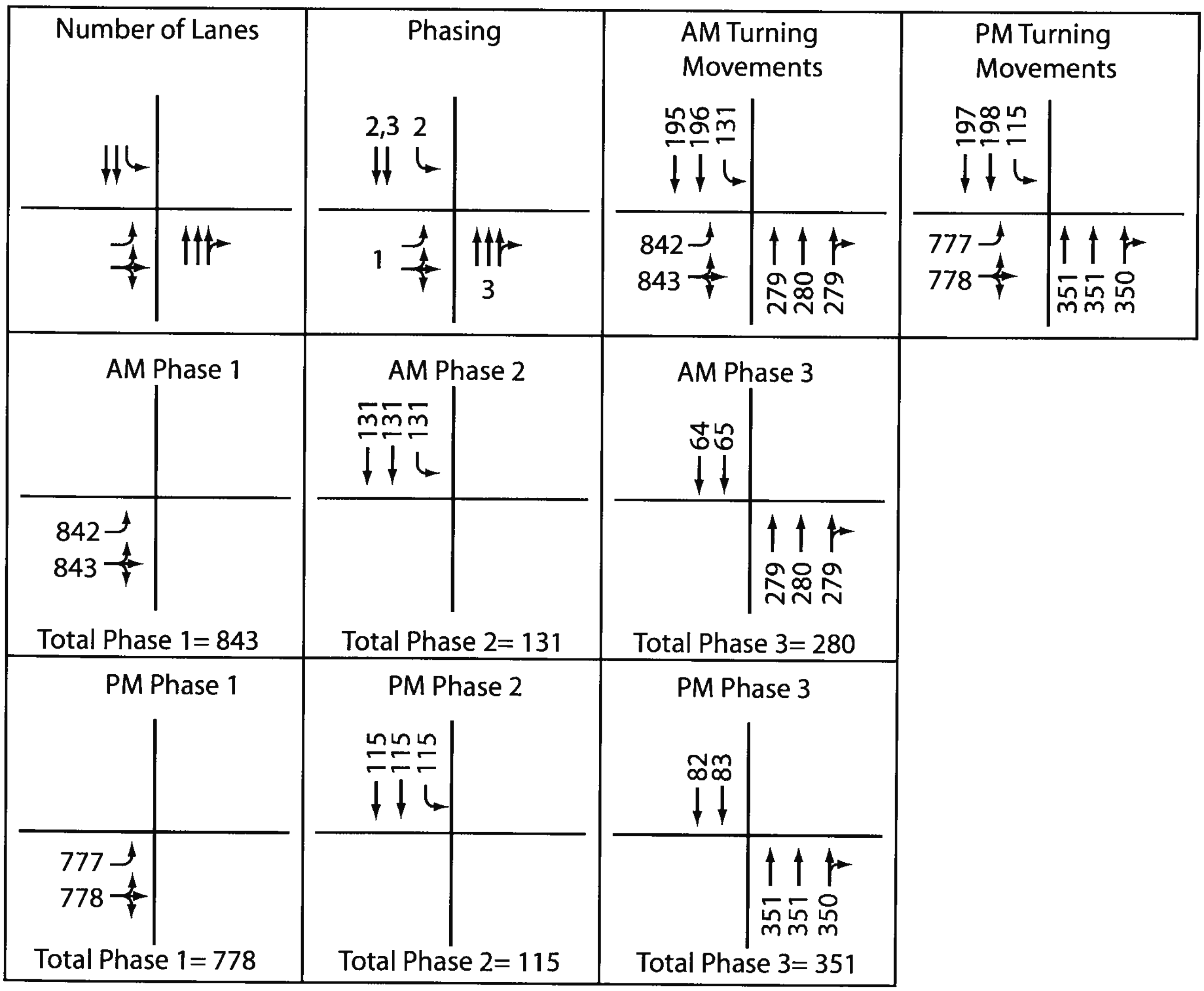
AM LOS= BELOW CAPACITY

PM TOTAL= 1040

PM LOS= BELOW CAPACITY

NOT TO SCALE

Intersection Name: Caliente Ave & SR-905 EB Ramps
Date: 10/17/2012
Scenario: Horizon Year Baseline



AM TOTAL= 1254

AM LOS= APPROACHING CAPACITY

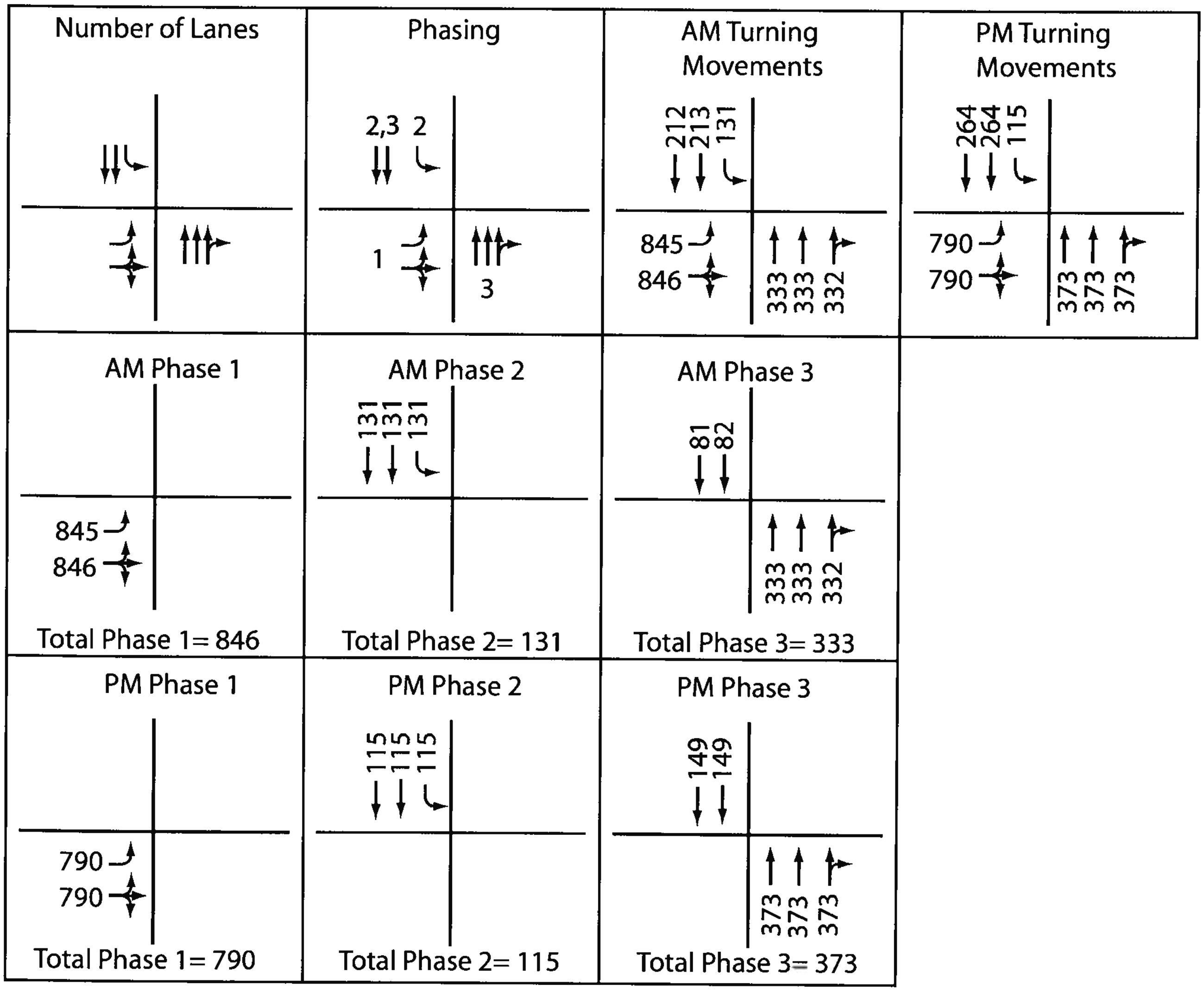
PM TOTAL= 1244

PM LOS= APPROACHING CAPACITY

NOT TO SCALE

Candlelight

Intersection Name: **Caliente Ave & SR-905 EB Ramps**
Date: **10/17/2012**
Scenario: **Horizon Year with Project**



AM TOTAL= 1310

AM LOS= APPROACHING CAPACITY

PM TOTAL= 1278

PM LOS= APPROACHING CAPACITY

NOT TO SCALE

APPENDIX E

- Fair Share Calculation Worksheets

Kimley-Horn and Associates, Inc.

FAIR SHARE CALCULATION WORKSHEET

Project: Candlelight

Date: 9-Apr-13

Project # : 95809001

EQUITABLE SHARE RESPONSIBILITY

$$P = \frac{T}{T_B - T_E}$$

Where:

P=The equitable share for the proposed project's traffic impact.

T= The vehicle trips generated by the project during the peak-hour in vehicles per hour, vph

T_B = The forecasted Horizon Year traffic volumes on an impacted facility, vph.

T_E = The traffic volumes existing on the facility, vph.

Int. 1 Otay Mesa Road and Caliente Avenue (AM Peaks):

$$P = \frac{T}{T_B - T_E} = \frac{94}{3{,}316 - 1{,}520} = 5.23\%$$

Int. 1 Otay Mesa Road and Caliente Avenue (PM Peaks):

$$P = \frac{T}{T_B - T_E} = \frac{105}{4{,}093 - 1{,}914} = 4.82\%$$

Int. 2 SR-905 WB Ramps and Caliente Avenue (AM Peak):

$$P = \frac{T}{T_B - T_E} = \frac{25}{1{,}531 - 571} = 2.60\%$$

Int. 2 SR-905 WB Ramps and Caliente Avenue (PM Peak):

$$P = \frac{T}{T_B - T_E} = \frac{11}{2{,}430 - 957} = 0.75\%$$

APPENDIX F

- Transit Information

CASH F[illegible]S / *Tarifas en efectivo*

Exact fare, please / *Favor de pagar la cantidad exacta*	
Day Pass (Regional) / *Pase diario (Regional)*	$5.00
One-Way Fare / *Tarifa de una direccion*	$2.25
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	$1.10*
Children 5 & under / *Niños de 5 años o menores*	FREE / *GRATIS**

MONTHLY PASSES / *Pases mensual*

Adult / *Adulto*	$72.00
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	$18.00*
Youths (18 and under) *Jóvenes (18 años o menores)*	$36.00*

DAY PASS (REGIONAL) / *Pase diario (Regional)*

Valid for unlimited travel for one person on Trolley, most MTS buses, NCTD Breeze and SPRINTER. Valid for a discount on COASTER fares; not valid on Premium Express, Rural, or special service buses, or ADA paratransit.

Válidos para viajes ilimitados de una sola persona para: el Trolley, la mayoría de los autobuses de MTS, y los servicios del NCTD de BREEZE y SPRINTER. Válidos para acceder a descuentos en el COASTER, pero no para las rutas Premium Express ni rurales, los servicios especiales ni los servicios para discapacitadas de ADA.

* I.D. required for discount fare or pass.
* *Se requiere identificación para tarifas o pases de descuento.*

DIRECTORY / *Direct*[illegible]

Regional Transit Information *Información de transporte público regional*	511 or/ó (619) 233-3004
TTY/TDD (teletype for hearing impaired) *Teletipo para sordos*	(619) 234-5005 or/ó (888) 722-4889
InfoExpress (24-hour info via Touch-Tone phone) *Información las 24 horas (via teléfono de teclas)*	(619) 685-4900
Customer Service / Suggestions *Servicio al cliente / Sugerencias*	(619) 557-4555
SafeWatch	(619) 557-4500
Lost & Found *Objetos extraviados*	(619) 427-6438 or/ó (800) 409-3310
The Transit Store	(619) 234-1060 1st & Broadway, Downtown San Diego M–F 9am–5pm
For MTS online trip planning *Planificación de viajes por Internet*	www.sdmts.com

For more information on riding MTS services, pick up a Rider's Guide on a bus or at the Transit Store, or visit www.sdmts.com.
Para obtener más información sobre el uso de los servicios de MTS, recoga un 'Rider's Guide' en un autobús o en 'The Transit Store,' o visita a www.sdmts.com.

Thank you for riding MTS! ***¡Gracias por viajar con MTS!***

Effective FEBRUARY 28, [illegible]

905

Iris Trolley – Otay Mesa

via SR-905 / Airway Rd.

AWARDED OUTSTANDING PUBLIC TRANSIT SYSTEM MTS

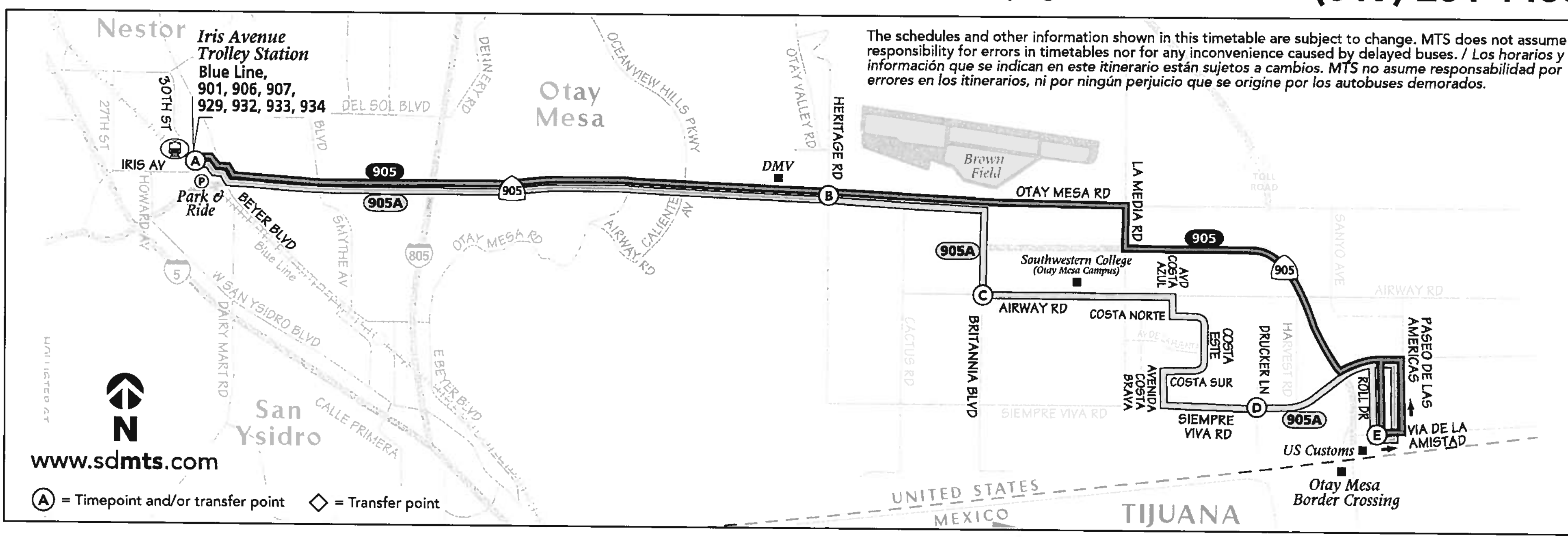
DESTINATIONS

- Brown Field
- Otay Mesa Industrial Parks
- Otay Mesa Port of Entry
- Southwestern College (Otay Mesa Campus)

MTS Metropolitan Transit System

TROLLEY CONNECTION
Iris Ave.

Alternative formats are available upon request. Please call: / *Formato alternativo disponible al preguntar. Favor de llamar:* (619) 231-1466



The schedules and other information shown in this timetable are subject to change. MTS does not assume responsibility for errors in timetables nor for any inconvenience caused by delayed buses. / *Los horarios y información que se indican en este itinerario están sujetos a cambios. MTS no asume responsabilidad por errores en los itinerarios, ni por ningún perjuicio que se origine por los autobuses demorados.*

Route 905 — Monday through Friday / *lunes a viernes*

Iris Avenue Trolley Station ➡ Otay Mesa Border Crossing

	Ⓐ Iris Avenue Trolley Station DEPART	Ⓑ Otay Mesa Rd. & Heritage Rd.	Ⓒ Airway Rd. & Britannia Blvd.	Ⓓ Siempre Viva Rd. & Drucker Lane	Ⓔ Otay Mesa Border Crossing ARRIVE
A	4:53a	4:59a	5:03a	5:07a	5:12a
A	5:08	5:15	5:20	5:25	5:30
A	5:23	5:30	5:35	5:40	5:45
A	5:38	5:45	5:50	5:57	6:03
A	5:53	6:00	6:05	6:12	6:18
A	6:05	6:12	6:17	6:24	6:30
A	6:20	6:27	6:32	6:39	6:45
A	6:35	6:43	6:48	6:56	7:02
A	6:50	6:58	7:03	7:11	7:17
A	7:05	7:13	7:18	7:26	7:32
A	7:20	7:28	7:33	7:41	7:47
A	7:35	7:43	7:48	7:56	8:02
A	7:50	7:58	8:03	8:11	8:17
A	8:05	8:13	8:18	8:26	8:32
A	8:20	8:28	8:33	8:41	8:47
A	8:35	8:43	8:48	8:56	9:02
A	9:05	9:13	9:18	9:26	9:32
	10:08	10:16	—	—	10:29
	11:08	11:16	—	—	11:29
	12:08p	**12:16p**	—	—	**12:29p**
	1:08	**1:16**	—	—	**1:29**
A	**1:23**	**1:31**	**1:36p**	**1:44p**	**1:50**
	1:38	**1:46**	—	—	**1:59**
A	**1:53**	**2:01**	**2:06**	**2:14**	**2:20**
	2:08	**2:16**	—	—	**2:29**
A	**2:23**	**2:31**	**2:36**	**2:44**	**2:50**
	2:38	**2:46**	—	—	**2:59**
A	**2:53**	**3:01**	**3:06**	**3:14**	**3:20**
	3:08	**3:16**	—	—	**3:29**
A	**3:23**	**3:31**	**3:36**	**3:44**	**3:50**
	3:38	**3:46**	—	—	**3:59**
A	**3:53**	**4:01**	**4:06**	**4:14**	**4:20**
	4:08	**4:16**	—	—	**4:29**
A	**4:23**	**4:31**	**4:36**	**4:44**	**4:50**
	4:38	**4:46**	—	—	**4:59**
A	**4:53**	**5:01**	**5:06**	**5:14**	**5:20**
	5:08	**5:16**	—	—	**5:29**
A	**5:23**	**5:31**	**5:36**	**5:43**	**5:48**
A	**5:38**	**5:46**	**5:51**	**5:58**	**6:03**
A	**6:08**	**6:16**	**6:21**	**6:28**	**6:33**
A	**6:38**	**6:46**	**6:51**	**6:58**	**7:03**
A	**7:08**	**7:16**	**7:20**	**7:26**	**7:31**
A	**7:38**	**7:46**	**7:50**	**7:56**	**8:01**

Otay Mesa Border Crossing ➡ Iris Avenue Trolley Station

	Ⓔ Otay Mesa Border Crossing DEPART	Ⓓ Siempre Viva Rd. & Drucker Lane	Ⓒ Airway Rd. & Britannia Blvd.	Ⓑ Otay Mesa Rd. & Heritage Rd.	Ⓐ Iris Avenue Trolley Station ARRIVE
A	4:39a	4:42a	4:47a	4:52a	4:59a
	4:58	—	—	5:07	5:15
A	5:08	5:12	5:18	5:24	5:32
	5:32	—	—	5:41	5:49
A	5:45	5:49	5:55	6:01	6:09
	6:00	—	—	6:10	6:19
A	6:12	6:16	6:23	6:30	6:39
	6:30	—	—	6:40	6:49
A	6:42	6:46	6:53	7:00	7:09
	7:00	—	—	7:10	7:19
A	7:12	7:16	7:23	7:30	7:39
	7:30	—	—	7:40	7:49
A	7:42	7:46	7:53	8:00	8:09
	8:00	—	—	8:10	8:19
A	8:11	8:15	8:22	8:29	8:39
	8:29	—	—	8:39	8:49
A	8:41	8:45	8:52	8:59	9:09
	8:59	—	—	9:09	9:19
A	9:11	9:15	9:22	9:29	9:39
	9:39	—	—	9:49	9:59
	10:39	—	—	10:49	10:59
	11:39	—	—	11:49	11:59
	12:39p	—	—	**12:49p**	**12:59p**
A	**1:31**	**1:35p**	**1:42p**	**1:49**	**1:59**
	1:49	—	—	**1:59**	**2:09**
A	**1:59**	**2:03**	**2:11**	**2:19**	**2:29**
	2:19	—	—	**2:29**	**2:39**
A	**2:29**	**2:33**	**2:41**	**2:49**	**2:59**
	2:49	—	—	**2:59**	**3:09**
A	**2:59**	**3:03**	**3:11**	**3:19**	**3:29**
	3:18	—	—	**3:29**	**3:39**
A	**3:29**	**3:33**	**3:41**	**3:49**	**3:59**
	3:48	—	—	**3:59**	**4:09**
A	**3:59**	**4:03**	**4:11**	**4:19**	**4:29**
	4:18	—	—	**4:29**	**4:39**
A	**4:29**	**4:33**	**4:41**	**4:49**	**4:59**
	4:48	—	—	**4:59**	**5:09**
A	**4:59**	**5:03**	**5:11**	**5:19**	**5:29**
A	**5:29**	**5:33**	**5:41**	**5:49**	**5:59**
A	**6:02**	**6:05**	**6:12**	**6:19**	**6:29**
A	**6:32**	**6:35**	**6:42**	**6:49**	**6:59**
A	**7:02**	**7:05**	**7:12**	**7:19**	**7:29**

Route 905 — Saturday* / *sábado**

Iris Avenue Trolley Station ➡ Otay Mesa Border Crossing

	Ⓐ Iris Avenue Trolley Station DEPART	Ⓑ Otay Mesa Rd. & Heritage Rd.	Ⓒ Airway Rd. & Britannia Blvd.	Ⓓ Siempre Viva Rd. & Drucker Lane	Ⓔ Otay Mesa Border Crossing ARRIVE
	—	—	—	—	—
A	6:09a	6:16a	6:20a	6:25a	6:30a
A	7:09	7:16	7:20	7:26	7:32
	8:09	8:16	—	—	8:26 C
A	9:09	9:16	9:20	9:26	9:32
	10:09	10:16	—	—	10:27 C
A	11:09	11:16	11:20	11:27	11:33
	12:09p	**12:16p**	—	—	**12:27p C**
A	**1:09**	**1:16**	**1:20p**	**1:27p**	**1:33**
	2:09	**2:16**	—	—	**2:27 C**
A	**3:09**	**3:16**	**3:20**	**3:27**	**3:33**
	4:09	**4:16**	—	—	**4:27 C**
A	**5:09**	**5:16**	**5:20**	**5:27**	**5:33**
A	**6:09**	**6:16**	**6:20**	**6:26**	**6:31**

Otay Mesa Border Crossing ➡ Iris Avenue Trolley Station

	Ⓔ Otay Mesa Border Crossing DEPART	Ⓓ Siempre Viva Rd. & Drucker Lane	Ⓒ Airway Rd. & Britannia Blvd.	Ⓑ Otay Mesa Rd. & Heritage Rd.	Ⓐ Iris Avenue Trolley Station ARRIVE
A	5:37a	5:41a	5:47a	5:52a	6:00a
A	6:35	6:39	6:45	6:51	7:00
	7:40	—	—	7:50	7:59
A	8:34	8:38	8:44	8:50	8:59
	9:40	—	—	9:50	9:59
A	10:34	10:38	10:44	10:50	10:59
	11:40	—	—	11:50	11:59
A	**12:33p**	**12:38p**	**12:45p**	**12:51p**	**12:59p**
	1:41	—	—	**1:51**	**1:59**
A	**2:33**	**2:38**	**2:45**	**2:51**	**2:59**
	3:41	—	—	**3:51**	**3:59**
A	**4:33**	**4:38**	**4:45**	**4:51**	**4:59**
	5:43	—	—	**5:52**	**5:59**
A	**6:37**	**6:40**	**6:47**	**6:53**	**7:00**

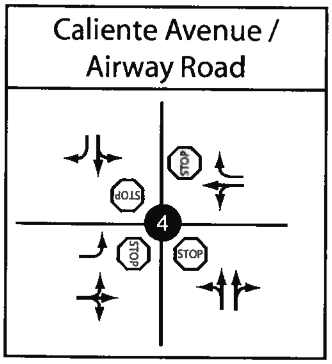
Route 905 — Sunday* / *domingo**

Route 905 does not operate on Sunday. / *Ruta 905 no opera los domingos.*

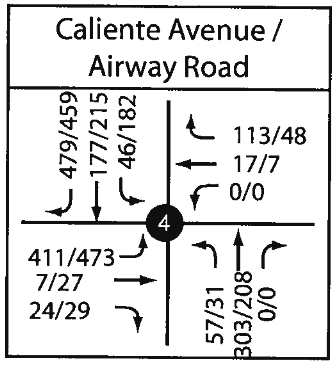
A = Route 905A. Trip serves Otay Mesa Industrial Park. / *Ruta 905A. Viaje que ofrece servicio a Otay Mesa Industrial Park.*
C = Bus continues as Route 905A serving Siempre Viva Rd. & Airway Rd. / *Autobús sigue sirviendo como ruta 905A vía Siempre Viva Rd. y Airway Rd.*
*A Saturday or Sunday schedule will be operated on most holidays and observed holidays, including New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving and Christmas. For holiday service details, visit www.sdmts.com or call 511.
**Se operará con horario de sábado o domingo durante la mayoría de los días festivos y los días de asueto a guardar. Los días festivos incluyen Año Nuevo, Presidents' Day, Memorial Day, Día de la Independencia (E.E.U.U.), Labor Day, Día de Acción de Gracias y Navidad. Para detalles sobre el servicio en días festivos, visite www.sdmts.com o llame al 511.*

APPENDIX G

- Signal Warrant Analysis



Existing With Project
Geometrics



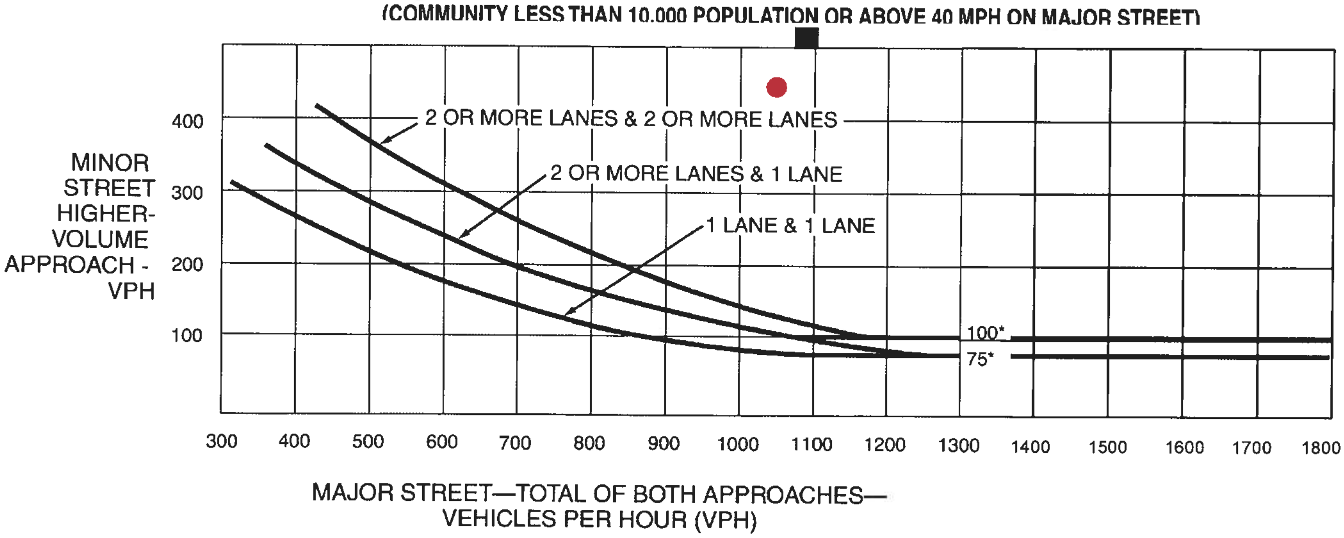
Near Term Plus Project
Peak-Hour Volumes
(am/pm)

Major Street: Caliente Avenue
Major Street Volume (both approaches): 1062 / 1095 VPH

Minor Street: Airway Road
Minor Street Volume (one approach): 442 / 529 VPH

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

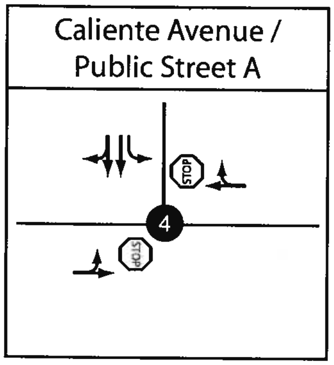
(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



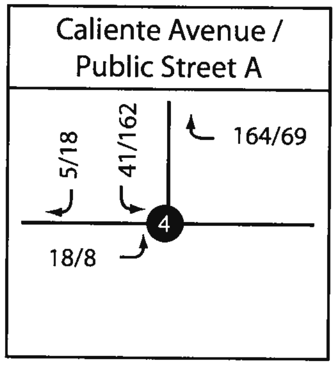
*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Chapter 4C – Traffic Control Signal Needs Studies
Part 4 – Highway Traffic Signals

CA-MUTCD
January 13, 2012



Existing with Project Geometrics



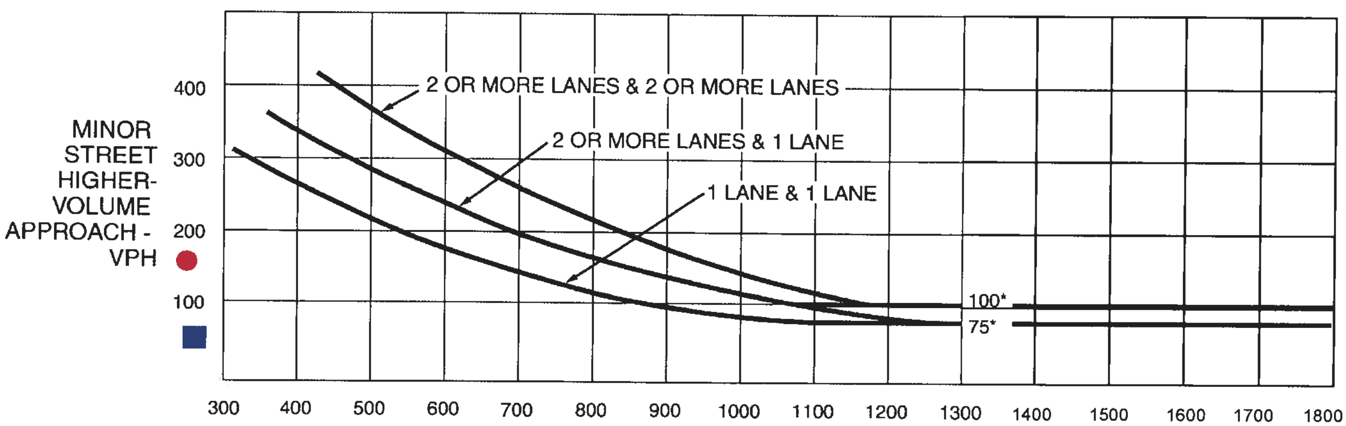
Existing with Project Peak-Hour Volumes (am/pm)

Major Street: Caliente Avenue
Major Street Volume (both approaches): 46 / 180 VPH

Minor Street: Airway Road
Minor Street Volume (one approach): 164 / 69 VPH

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



MAJOR STREET—TOTAL OF BOTH APPROACHES—
VEHICLES PER HOUR (VPH)

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

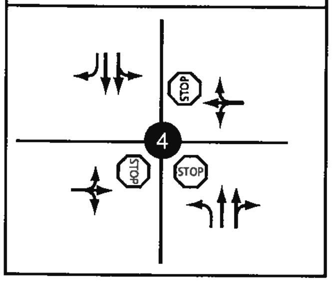
AM Peak-Hour

PM Peak-Hour

Chapter 4C – Traffic Control Signal Needs Studies
Part 4 – Highway Traffic Signals

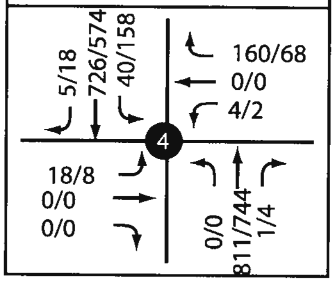
CA-MUTCD
January 13, 2012

Caliente Avenue / Public Street A



Horizon Year with Project Geometrics

Caliente Avenue / Public Street A



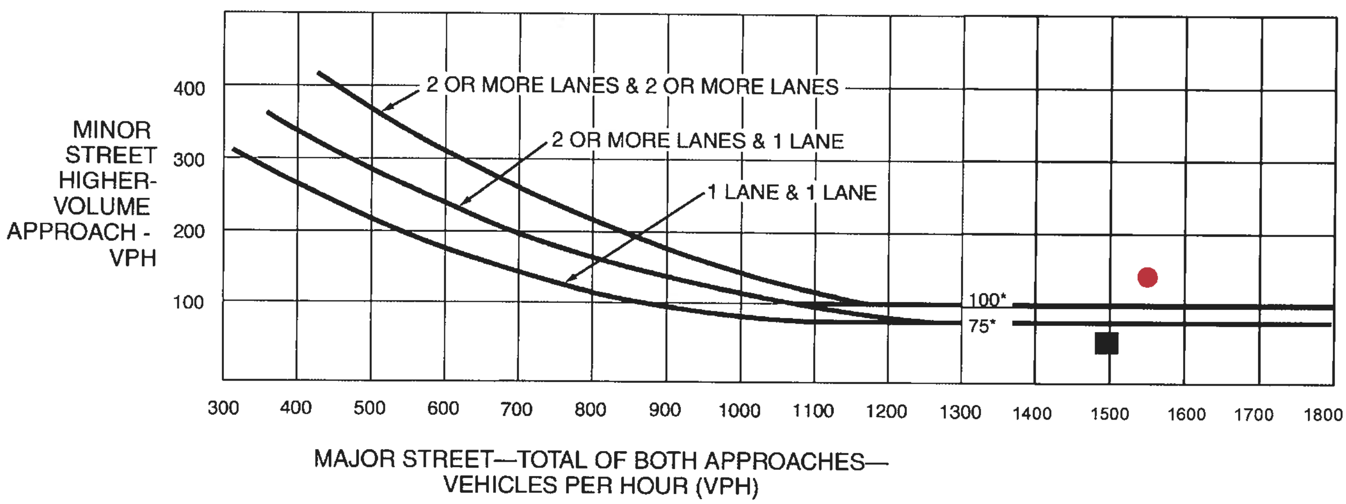
Horizon Year with Project Peak-Hour Volumes (am/pm)

Major Street: Caliente Avenue
Major Street Volume (both approaches): 1583 / 1498 VPH

Minor Street: Airway Road
Minor Street Volume (one approach): 160 / 68 VPH

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



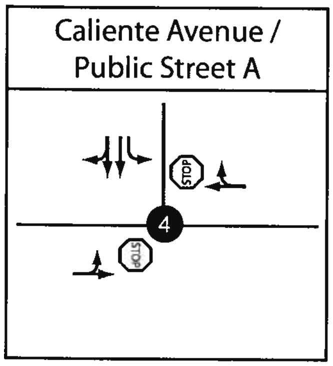
*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

AM Peak-Hour

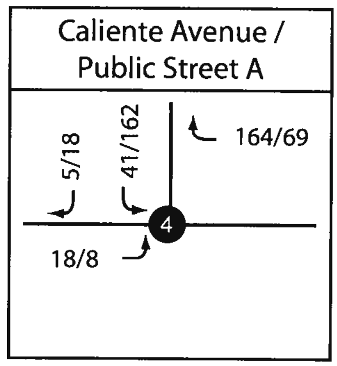
PM Peak-Hour

Chapter 4C – Traffic Control Signal Needs Studies
Part 4 – Highway Traffic Signals

CA-MUTCD
January 13, 2012



Near Term with Project
Geometrics



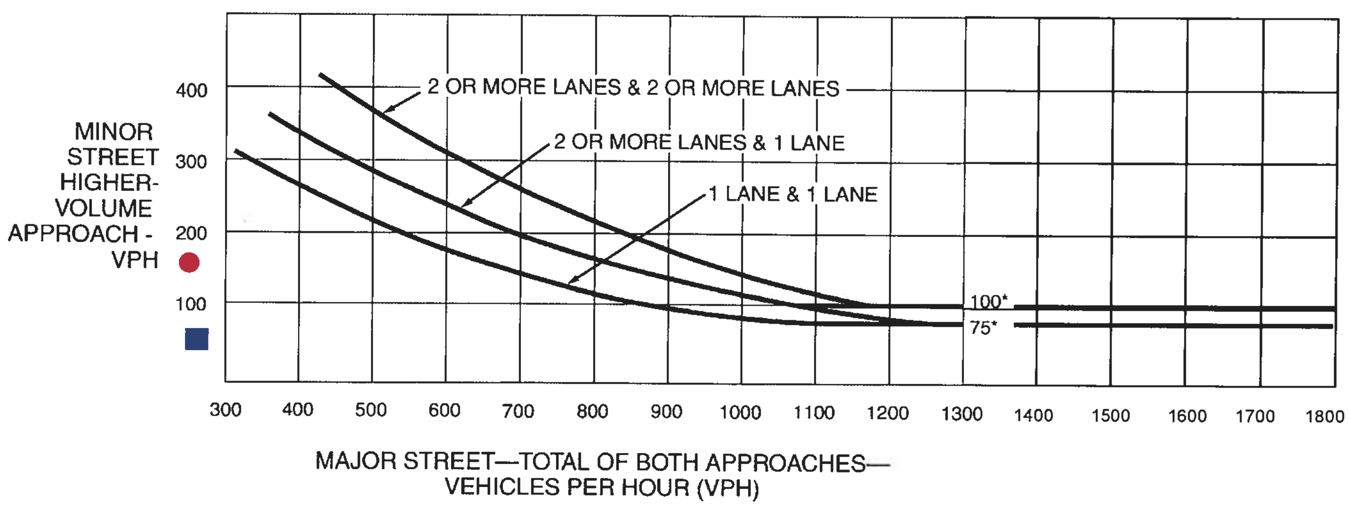
Near Term with Project
Peak-Hour Volumes
(am/pm)

Major Street: Caliente Avenue
Major Street Volume (both approaches): 46 / 180 VPH

Minor Street: Airway Road
Minor Street Volume (one approach): 164 / 69 VPH

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

● AM Peak-Hour

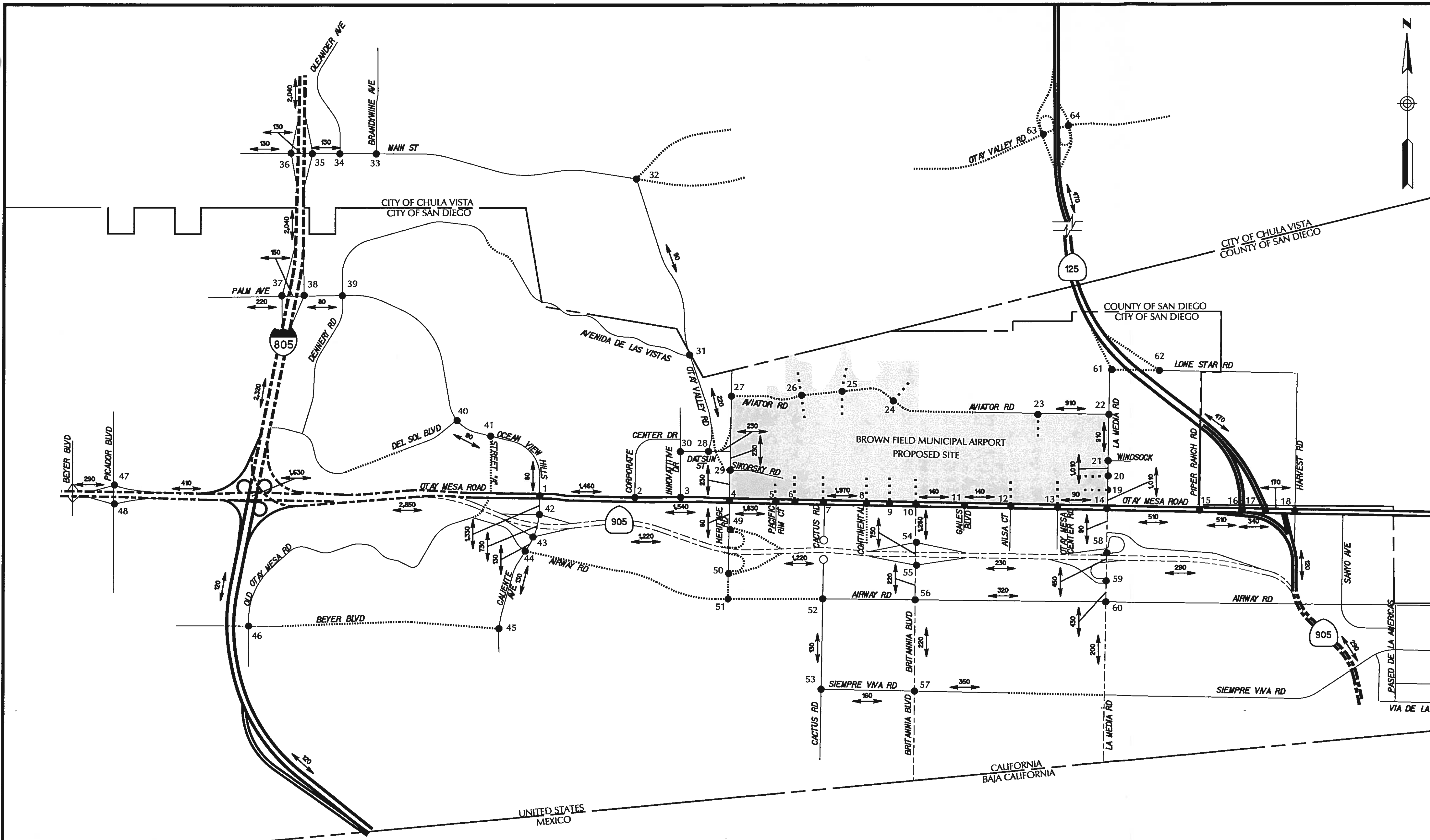
■ PM Peak-Hour

Chapter 4C – Traffic Control Signal Needs Studies
Part 4 – Highway Traffic Signals

CA-MUTCD
January 13, 2012

APPENDIX H

- Cumulative Projects Information



RICK
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(FAX)619.291.4165

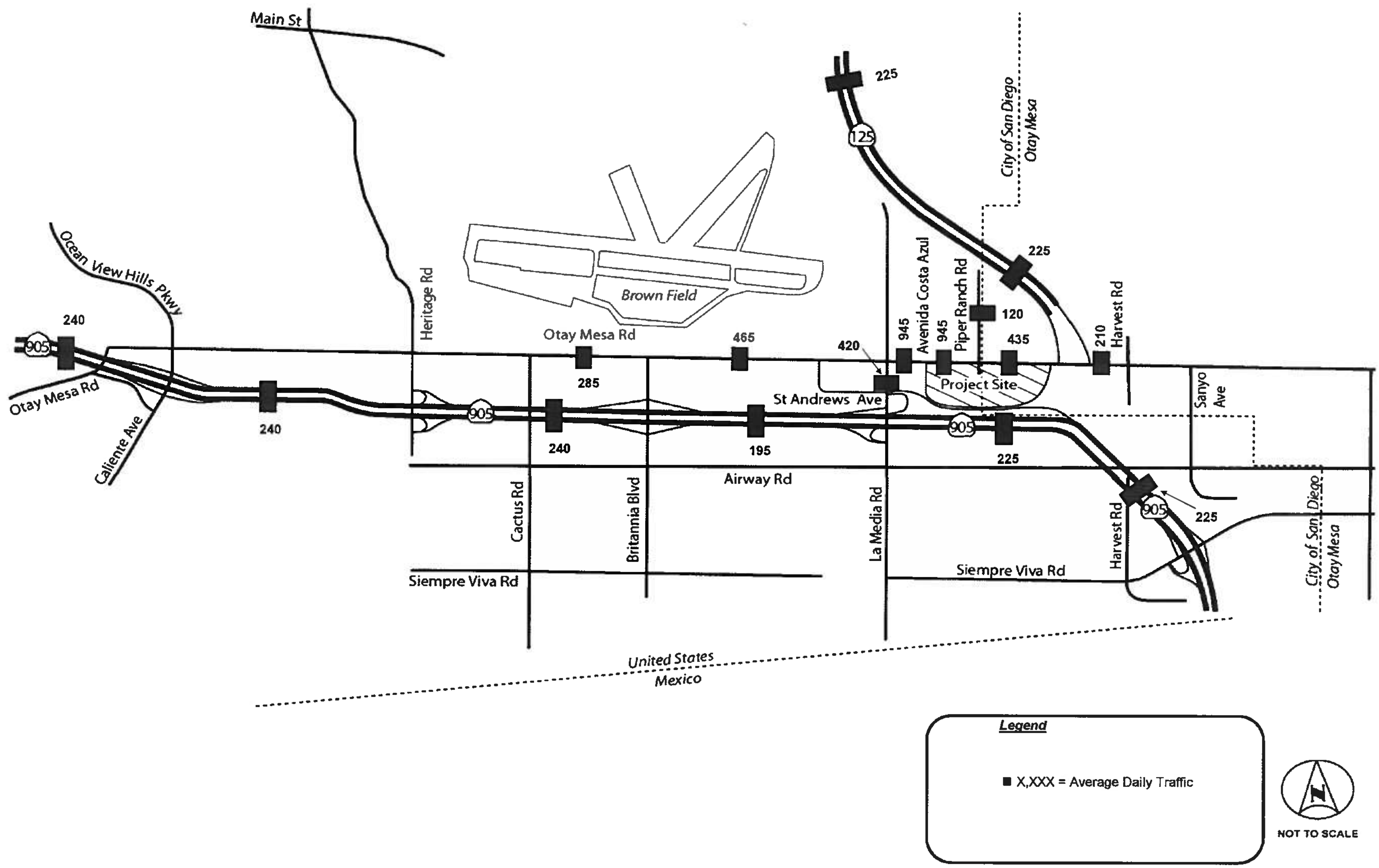
EXHIBIT 11A

PHASE 1 TRIP ASSIGNMENT FOR YEAR 2013 (PHASE 1 OPENING YEAR) SCENARIO

METROPOLITAN AIRPARK TRAFFIC IMPACT ANALYSIS

LEGEND
● = STUDY INTERSECTION
····= PROJECT ACCESS
······= FUTURE ROAD
—·—= TRUCK ROUTE
XX,XXX = ADT

T:\15818_Brown_Field\Exhibits\Exhibits_April2012_Submittal\Exhibit11A_ProjTripGenYR2013.dgn
10-APR-2012 11:50



Kimley-Horn and Associates, Inc.

FIGURE 4-14

Project Trip Assignment Phase I - Roadway Segments

K:\SND_LDEV\095128015 - Sunroad 80\Traffic\Excel\[128015RS01.xlsm]ADT Fig (NT)\Project Trip Assignment Phase I - Roadway Segments

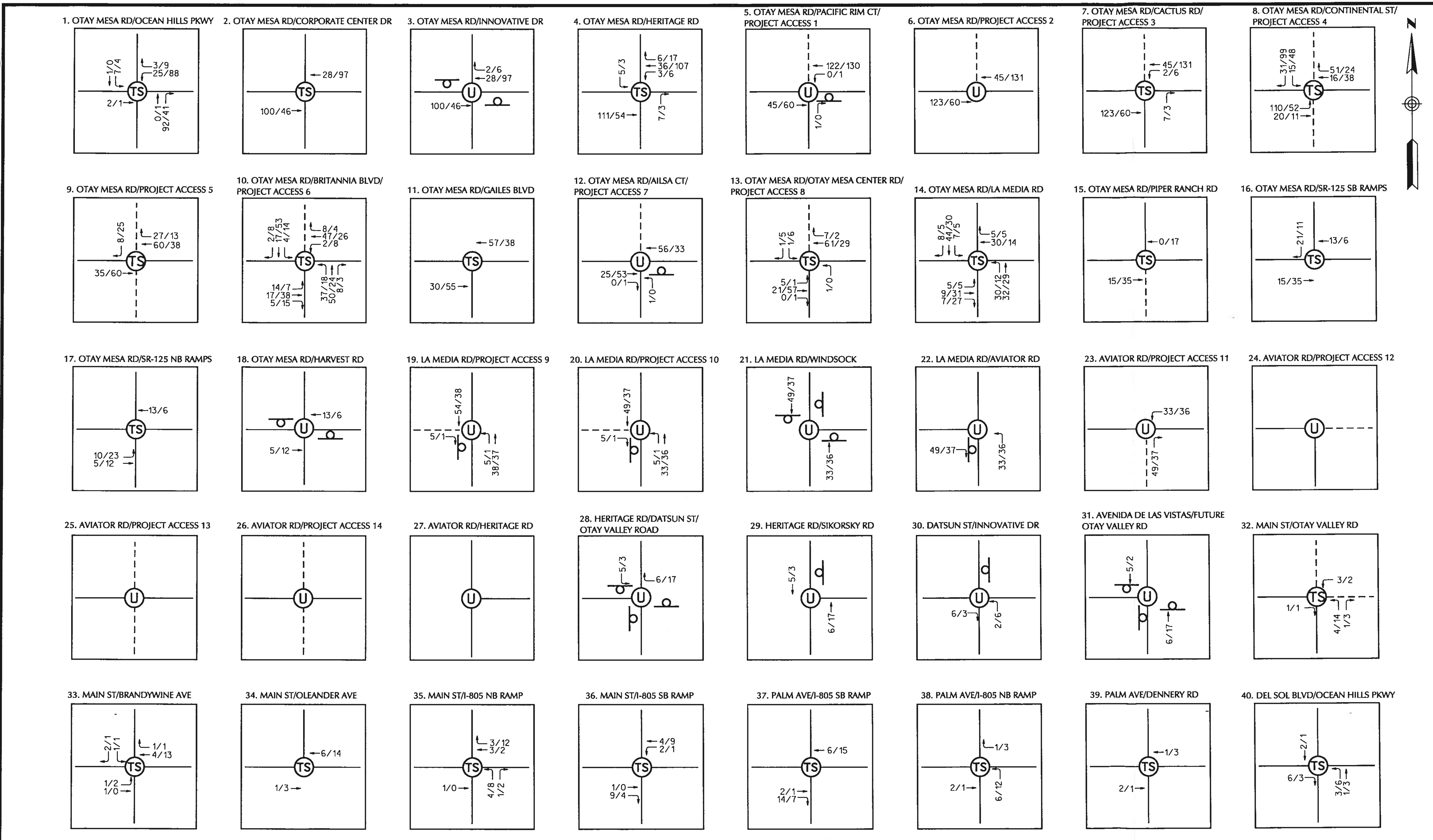


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EXHIBIT 11B

PHASE 1 TRIP ASSIGNMENT FOR YEAR 2013 (PHASE 1 OPENING YEAR) SCENARIO

METROPOLITAN AIRPARK TRAFFIC IMPACT ANALYSIS

LEGEND

- = STOP-CONTROLLED
- (TS) = TRAFFIC SIGNAL
- (U) = UNSIGNALIZED INTERSECTION
- XXX/XXX = AM/PM PEAK HOUR VOLUMES
- --- = FUTURE STREET/ PROJECT ACCESS

T:\15818_Brown_Field\Exhibits\Exhibits_April2012_Submittal\Exhibit11B_ProjTripGenYR2013.dgn
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10-APR-2012 11:50

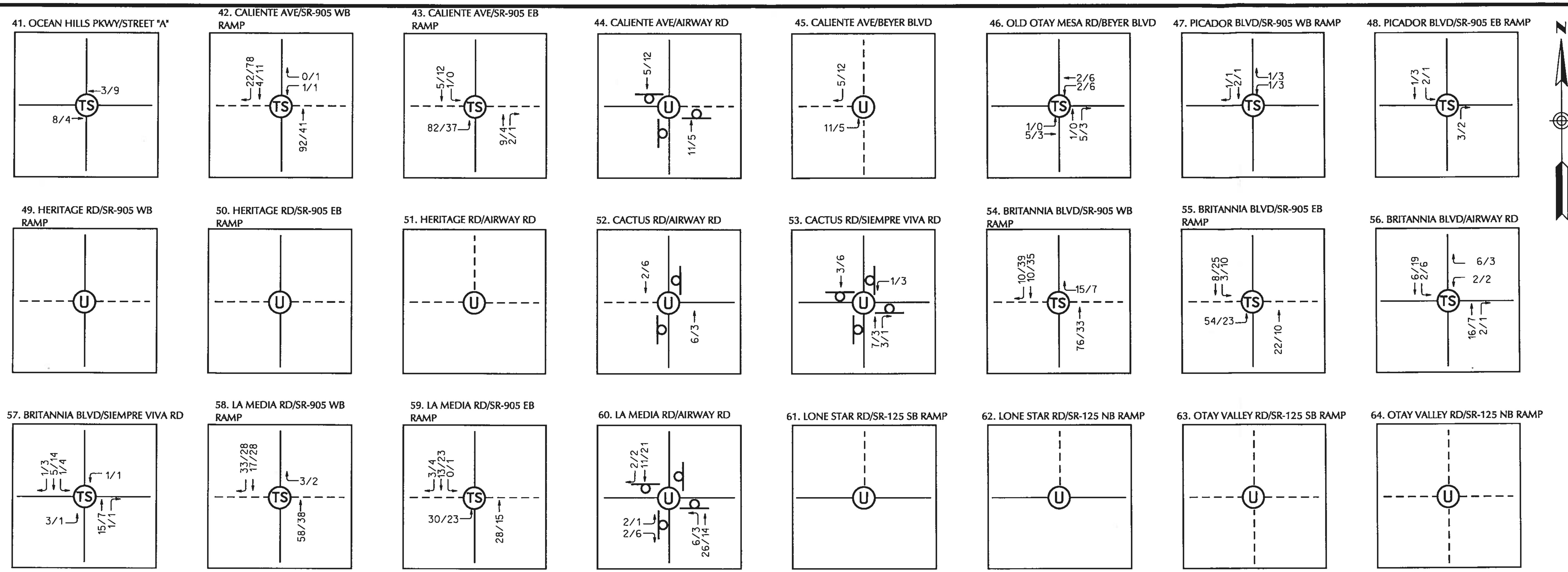

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EXHIBIT 11C

PHASE 1 TRIP ASSIGNMENT FOR YEAR 2013 (PHASE 1 OPENING YEAR) SCENARIO

METROPOLITAN AIRPARK TRAFFIC IMPACT ANALYSIS

LEGEND

= STOP-CONTROLLED

(TS) = TRAFFIC SIGNAL

(U) = UNSIGNALIZED INTERSECTION

XXX/XXX = AM/PM PEAK HOUR VOLUMES

--- = FUTURE STREET/ PROJECT ACCESS

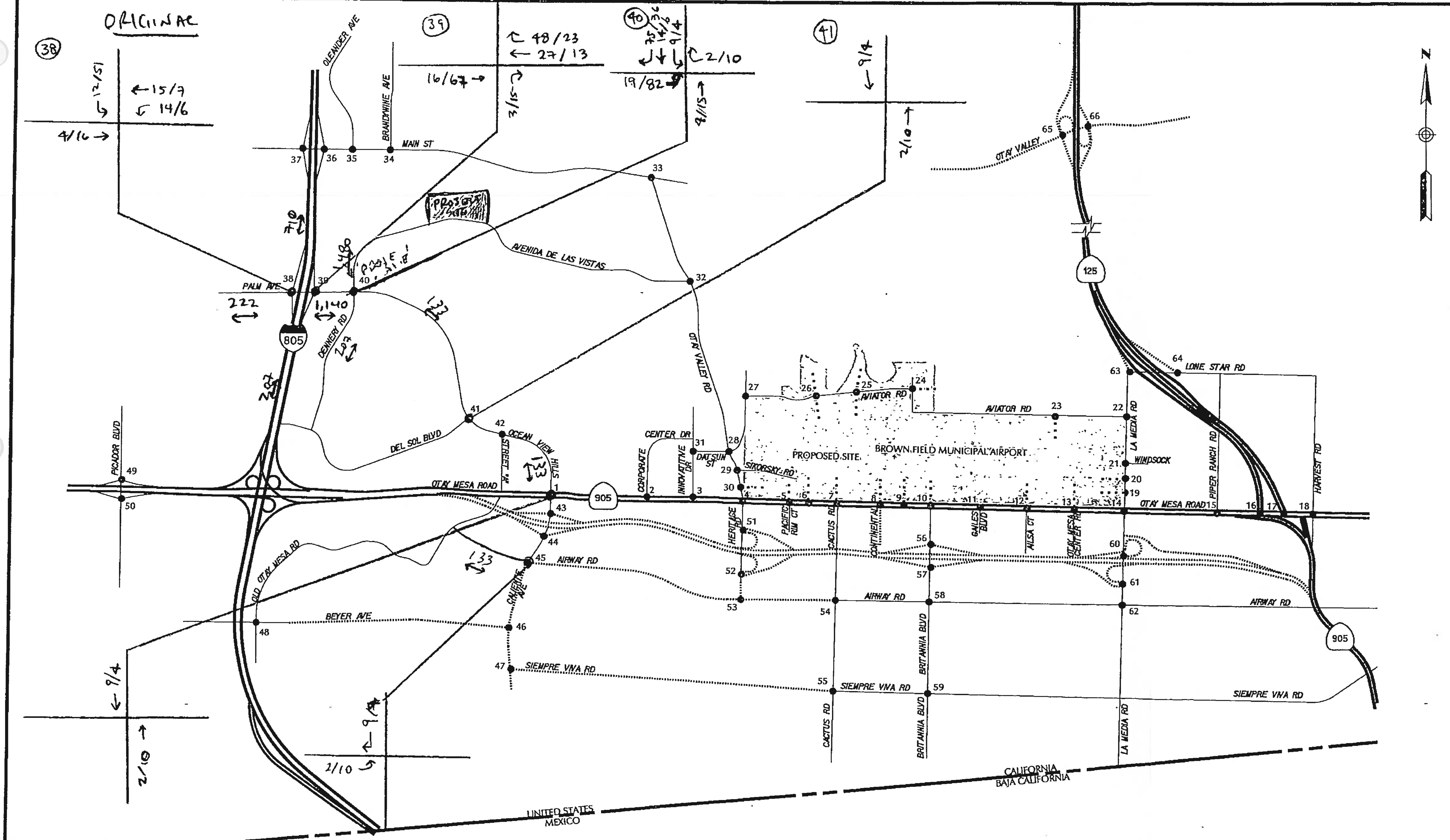

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EXHIBIT 2
PROJECT STUDY AREA
BROWN FIELD TRAFFIC ANALYSIS

LAS CASITAS
XXX ADT

LEGEND
● = STUDY INTERSECTION
• • • • = PROJECT ACCESS
········ = FUTURE ROAD

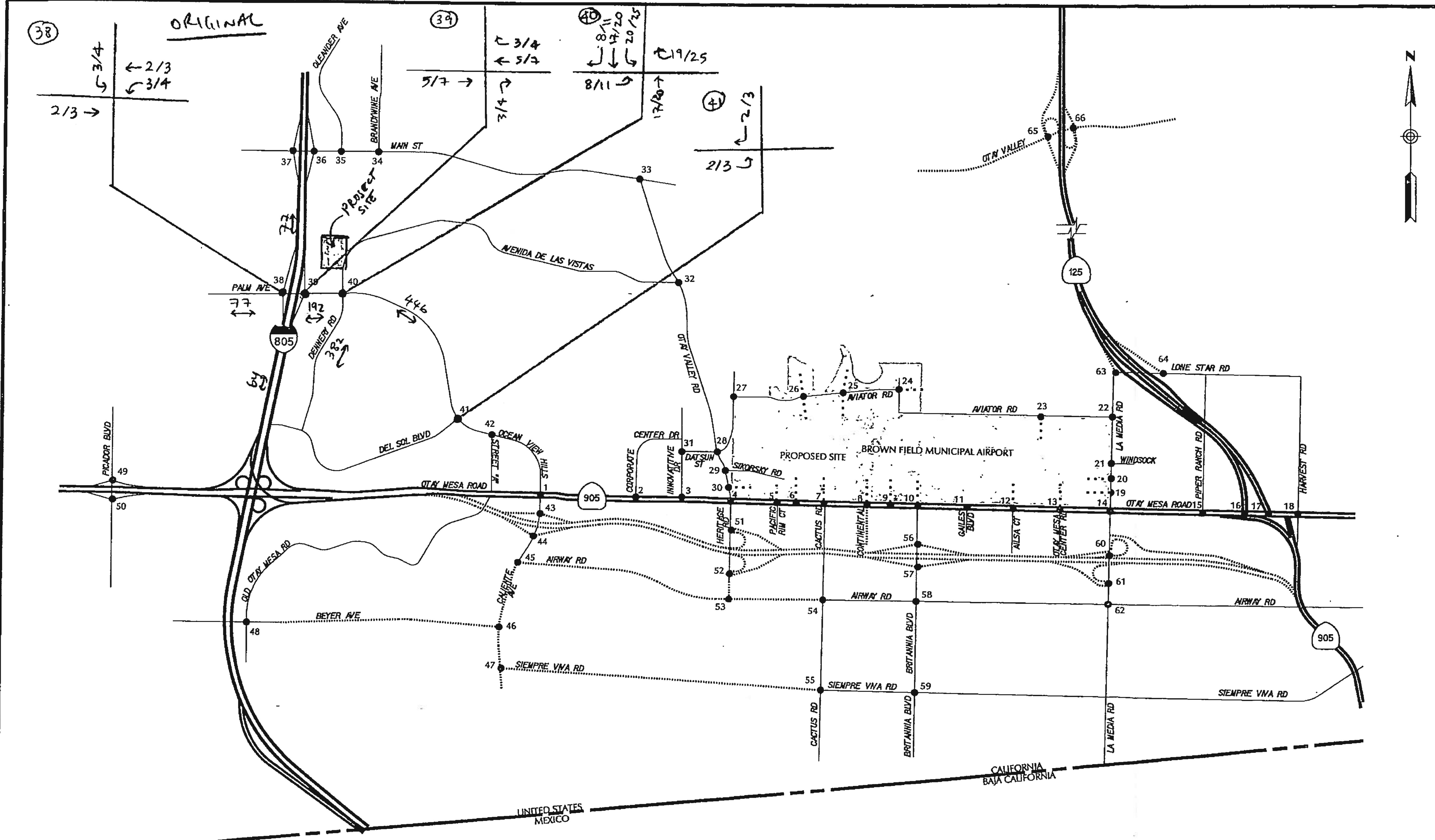

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EXHIBIT 2
PROJECT STUDY AREA
BROWN FIELD TRAFFIC ANALYSIS

NAKANO
XXX ADT (

LEGEND
● = STUDY INTERSECTION
- - - = PROJECT ACCESS
······· = FUTURE ROAD

12

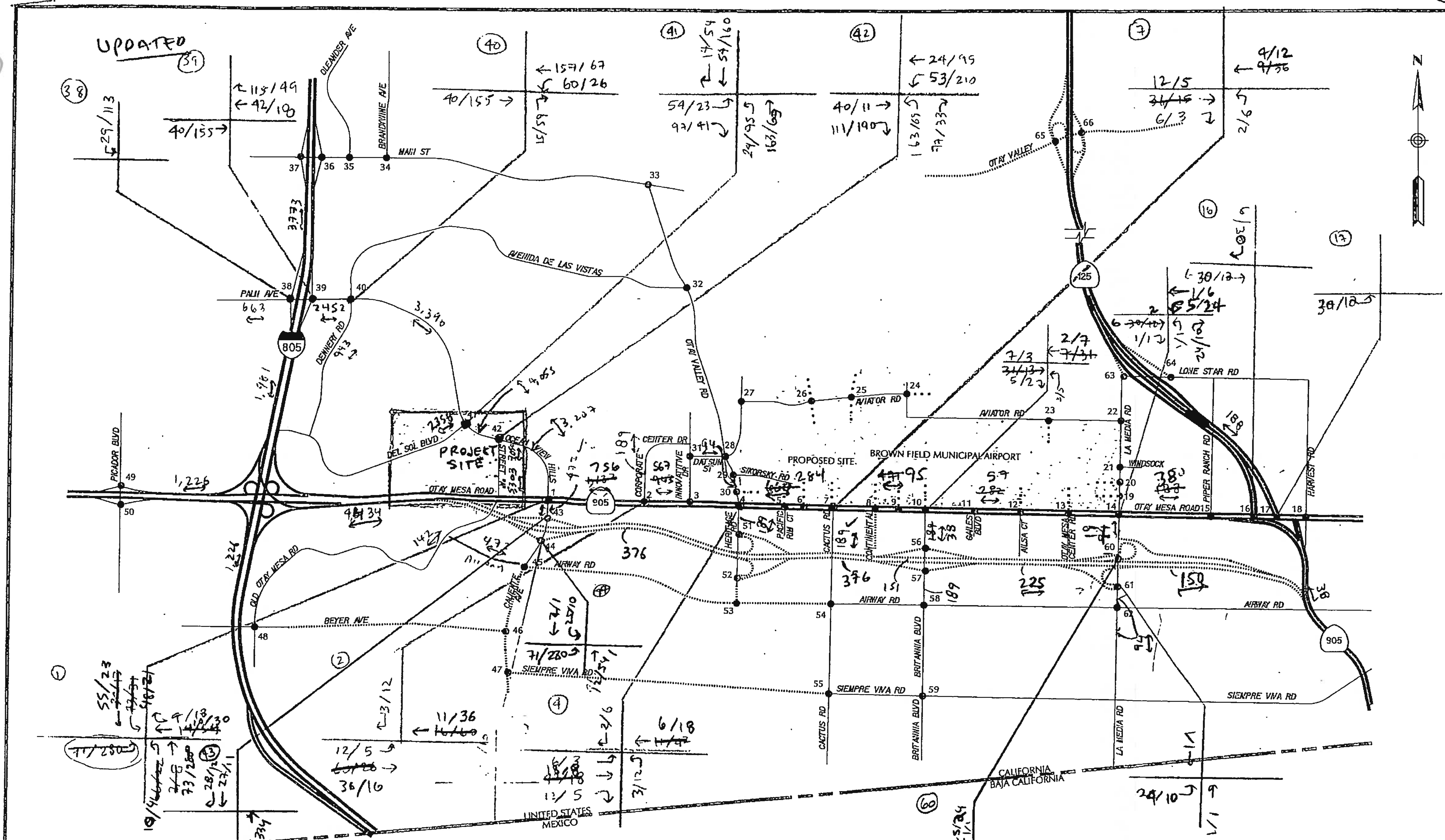

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EXHIBIT 2
PROJECT STUDY AREA
BROWN FIELD TRAFFIC ANALYSIS

PLAYA DEL SOL
XXX ADT

LEGEND
● = STUDY INTERSECTION
- - - = PROJECT ACCESS
······ = FUTURE ROAD

(13)

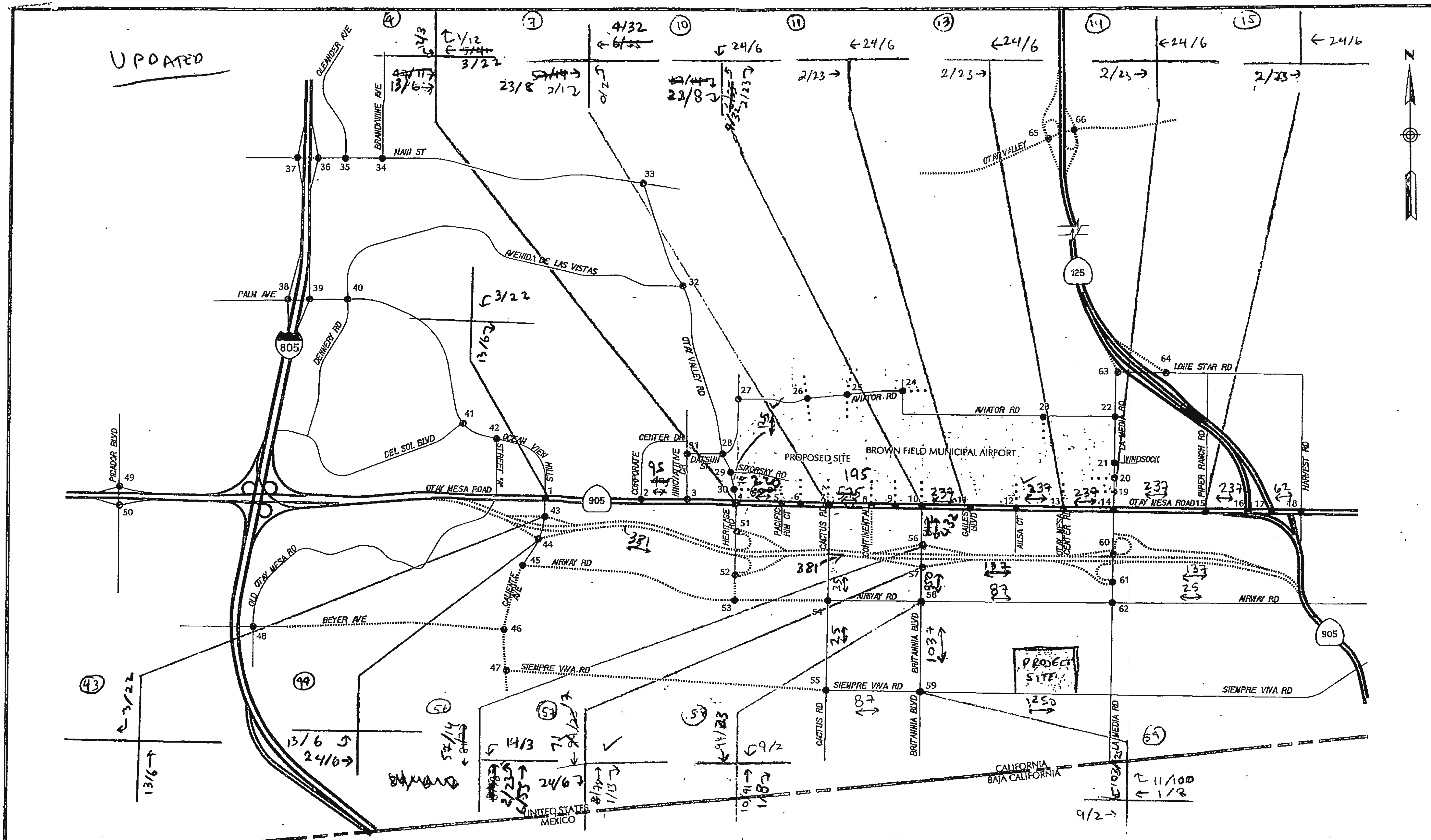

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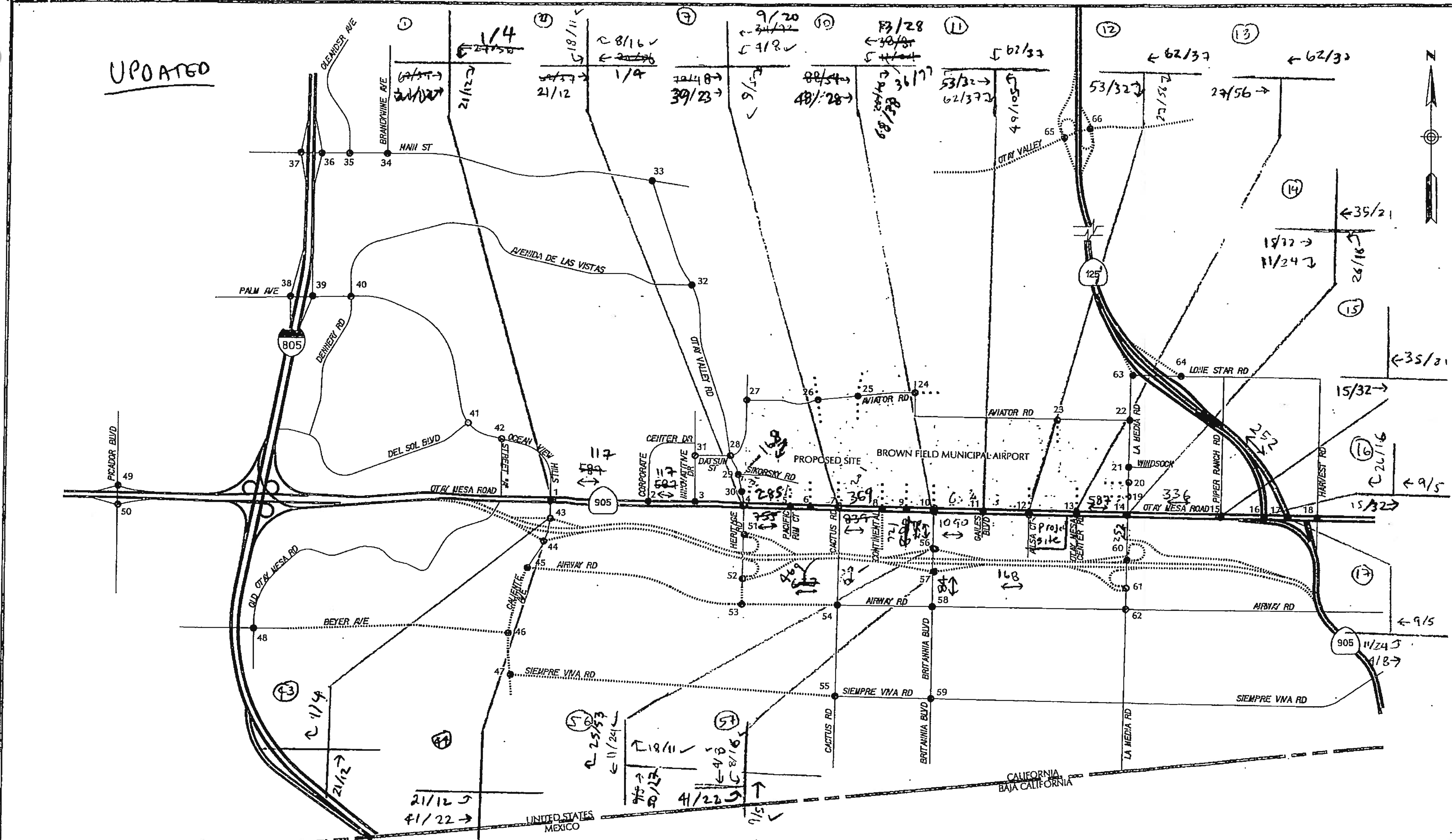
EXHIBIT 2
PROJECT STUDY AREA
BROWN FIELD TRAFFIC ANALYSIS

SIEMPRE VIVA INDUSTRIAL PARK (2010) PHASE 1
XXX ADT

LEGEND
● = STUDY INTERSECTION
- - - = PROJECT ACCESS
.... = FUTURE ROAD



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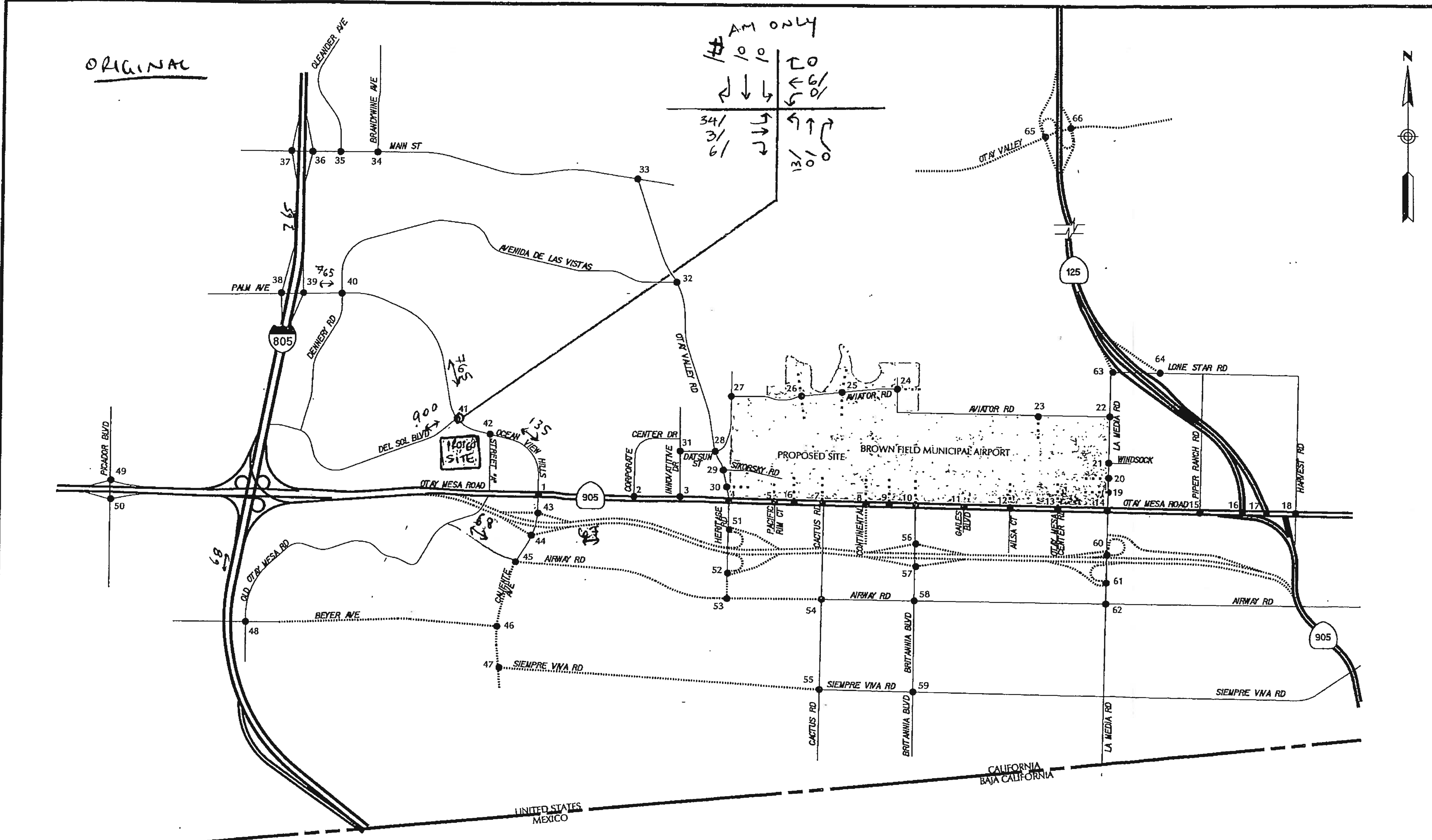
(FAX)619.291.4165

EXHIBIT 2
PROJECT STUDY AREA
BROWN FIELD TRAFFIC ANALYSIS

SOUTH BAY PROJECT
XXX ADT

LEGEND
● = STUDY INTERSECTION
- - - = PROJECT ACCESS
······ = FUTURE ROAD

(19)



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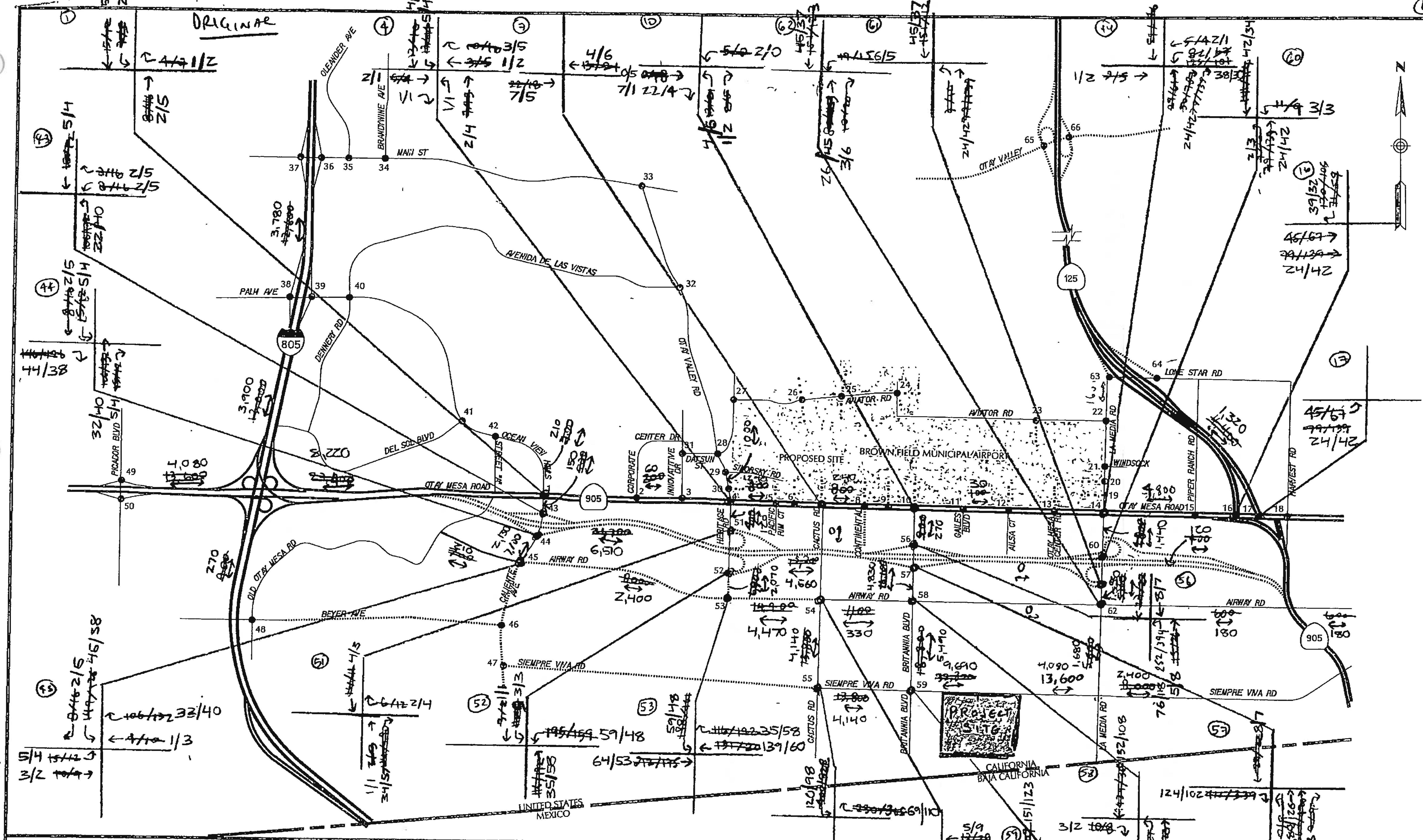
(FAX)619.291.4165

EXHIBIT 2
PROJECT STUDY AREA
BROWN FIELD TRAFFIC ANALYSIS

VISTA DEL MAR ELEMENTARY

LEGEND
● = STUDY INTERSECTION
- - - - = PROJECT ACCESS
········ = FUTURE ROAD



RICK ENGINEERING COMPANY
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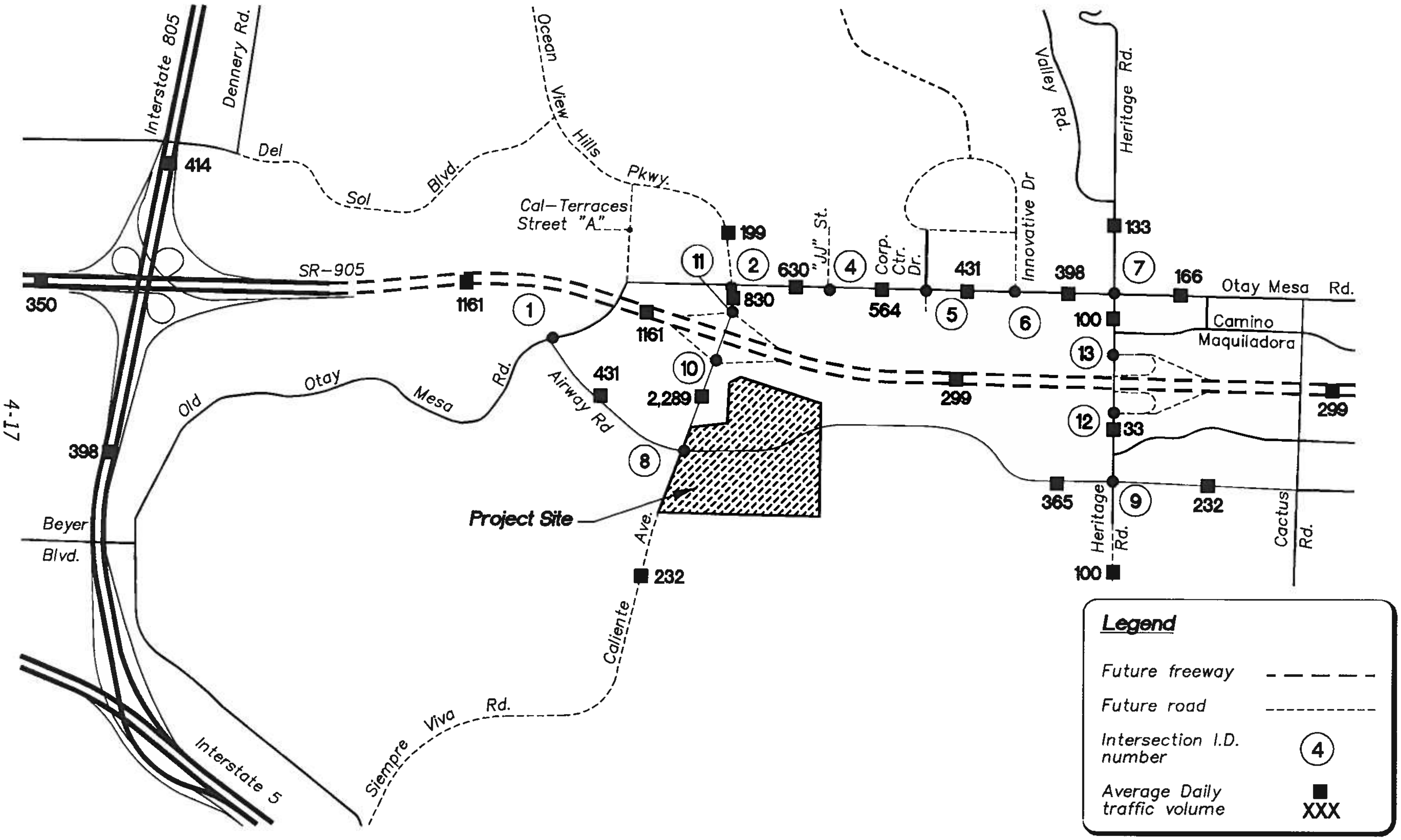
619.291.0707
(FAX)619.291.4165

EXHIBIT 2
PROJECT STUDY AREA
BROWN FIELD TRAFFIC ANALYSIS

CROSS BORDER FACILITY
XXX ADT (13,683)

LEGEND
● = STUDY INTERSECTION
····· = PROJECT ACCESS
------ = FUTURE ROAD



Kimley-Horn and Associates, Inc.

Figure 4-8
Build-Out Project Trip Assignment (With Airway Rd) - Roadway Segments

K:\095372000\Figures\January 2006\Buildout with Airway Project Trip Assignments.dwg 1-12-06-11:49 AM s/dwgs/095169002/9002assign-ph1.dwg 2-21-02 1:33:30 pm EST

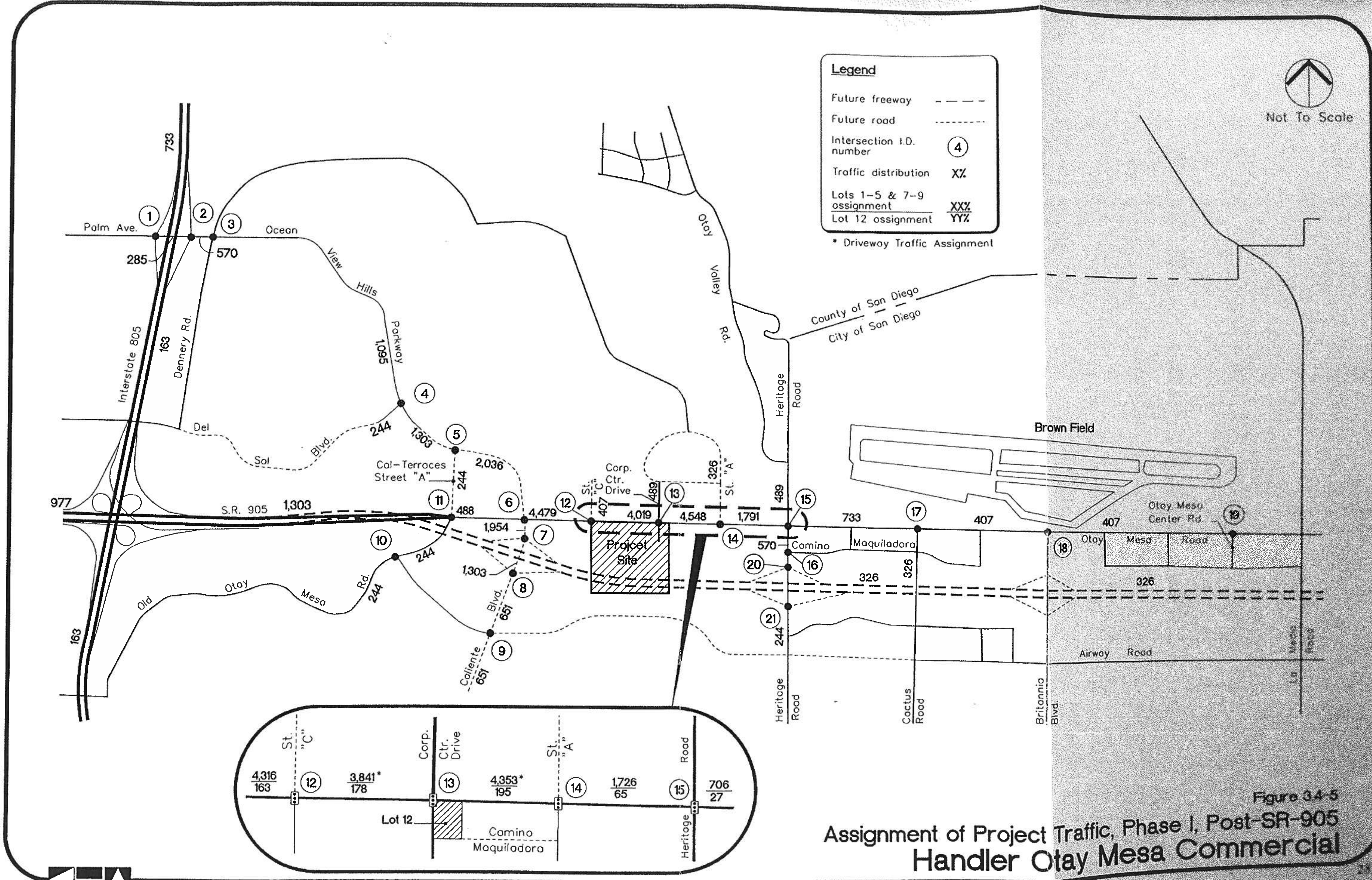
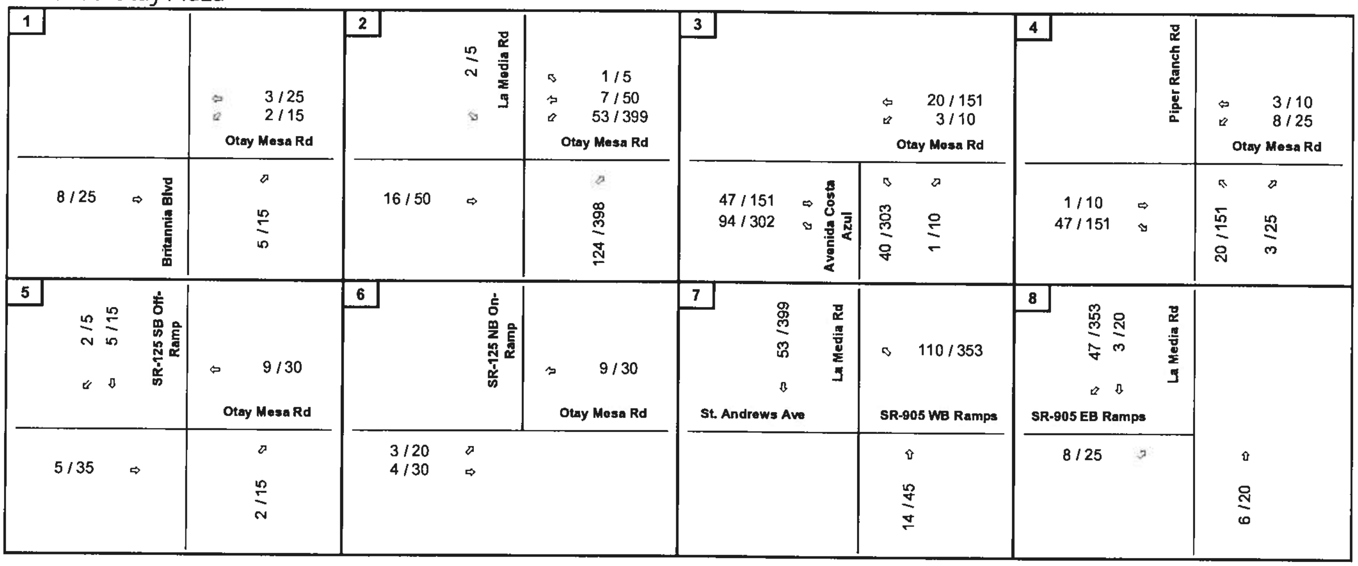


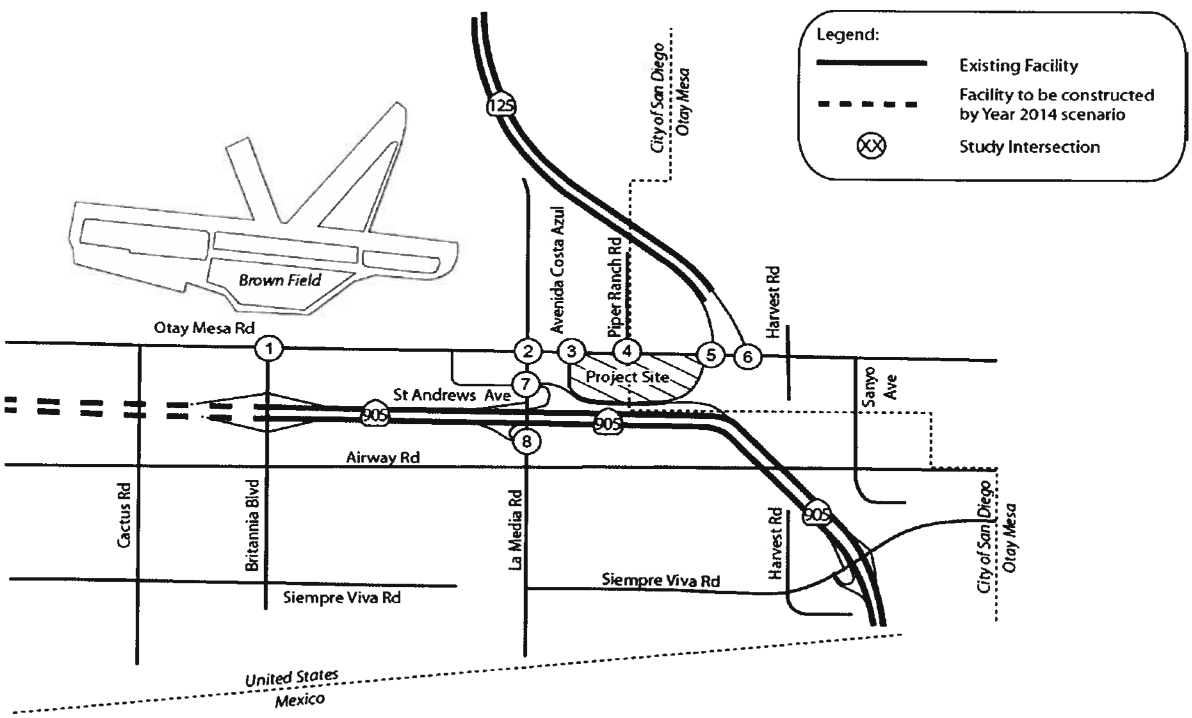
Figure 3.4-5

Assignment of Project Traffic, Phase I, Post-SR-905

Handler Otay Mesa Commercial

KIMLEY-HORN and ASSOCIATES

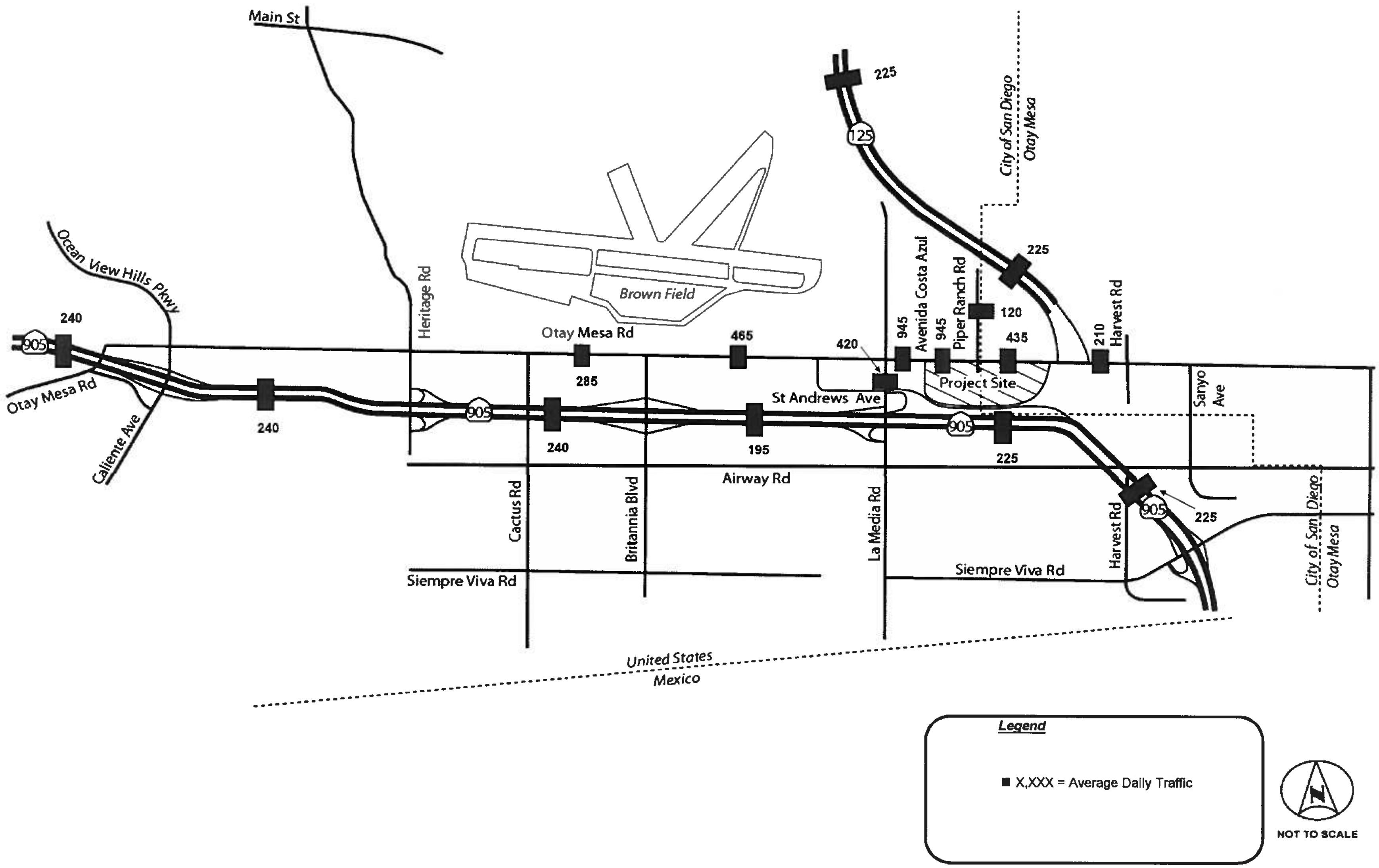




Legend

X / Y = AM / PM PEAK HOUR TURNING VOLUMES

NOT TO SCALE



Kimley-Horn and Associates, Inc.

FIGURE 4-14

Project Trip Assignment Phase I - Roadway Segments

K:\SND_LDEV\095128015 - Sunroad 80\Traffic\Excel\[128015RS01.xlsm]ADT Fig (NT)\Project Trip Assignment Phase I - Roadway Segments

APPENDIX I

- Existing Signal Timing

LOCATION: **RTE 905 @ CALIENTE AVE./OCEAN VIEW HILLS PARKWAY**

CALTRANS C8 Version 3 DATE: 2/14/11

F PAGE

	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9	PRE-EMPTION E		FLAGS	F 1	2	3	4	5	6	7	8	
0	WALK	1	7	1	1	1	7	1	7	CLK RST	EV SEL	0	PERMIT	1	2	3	4	5	6	7	8	0
1	DONT WALK	1	33	1	1	1	36	1	40		RR1 CLR	5	RED LOCK			3	4	5		7	8	1
2	MIN GREEN	5	5	5	5	5	5	5	5		EVA DLY	0	YEL LOCK									2
3	TYPE 3 DET	0	0	0	0	0	0	0	0		EVA CLR	5	V RECALL		2				6			3
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		EVB DLY	0	P RECALL									4
5	PASSAGE	2.0	9.0	3.0	2.0	2.0	9.0	2.0	2.0		EVB CLR	5	PED PHASES		2				6		8	5
6	MAX GAP	2.0	7.0	3.0	2.0	2.0	7.0	2.0	2.0		EVC DLY	0	RT OLA									6
7	MIN GAP	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0		EVC CLR	5	RT OLB									7
8	MAX EXT	15	100	20	25	15	100	20	25		EVD DLY	0	DBL ENTRY									8
9	MAX 2			35					45	YR	EVD CLR	5	MAX 2 PHASES			3					8	9
A	MAX 3									MO	MAX EV	255	LAG PHASES	READ ONLY								A
B										DAY	RR2 CLR	5	RED REST									B
C	REDUCE BY	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	DOW			REST-IN-WALK									C
D	EVERY	1.0	0.4	1.0	1.0	1.0	0.4	1.0	1.0	HR			MAX 3 PHASES									D
E	YELLOW	3.2	4.7	3.2	3.6	3.2	4.7	3.2	3.6	MIN			YEL START UP		2				6			E
F	RED	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	SEC			FIRST PHASE			3					8	F
3.5'	PED XING FT		137'				146'		156'					1	2	3	4	5	6	7	8	

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	0
FOF	5

FCO	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FDO TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

NOTES: **50 MPH**

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

LOCATION: **RTE 905 @ CALIENTE AVE./OCEAN VIEW HILLS PARKWAY**

CALTRANS C8 Version 3 DATE: 9/13/2012

C PAGE

		CONTROL PLANS									Y-COORD			LAG PHASE	FLAGS									
		1	2	3	4	5	6	7	8	9		C	D	E	F	1	2	3	4	5	6	7	8	
0	CYCLE LENGTH														LAG FZ FREE		2	3			6		8	0
1	FZ1 GRN FCTR													GAPOUT CP1	LAG FZ CP 1									1
2														GAPOUT CP2	LAG FZ CP 2									2
3	FZ3 GRN FCTR													GAPOUT CP3	LAG FZ CP 3									3
4	FZ4 GRN FCTR										PERM TIME			GAPOUT CP4	LAG FZ CP 4									4
5	FZ5 GRN FCTR										LAG OFFSET			GAPOUT CP5	LAG FZ CP 5									5
6											FORCE OFF			GAPOUT CP6	LAG FZ CP 6									6
7	FZ7 GRN FCTR										LONG GRN			GAPOUT CP7	LAG FZ CP 7									7
8	FZ8 GRN FCTR										NO GREEN			GAPOUT CP8	LAG FZ CP 8									8
9	MULTI CYCLE													GAPOUT CP9	LAG FZ CP 9									9
A	OFFSET A										OFFSET				LAG C COORD									A
B	OFFSET B														LAG D COORD									B
C	OFFSET C														COORD FAZES		2				6			C
D	FZ 3 EXT																							D
E	FZ 7 EXT																							E
F	OFFSET INTRPT																							F
																1	2	3	4	5	6	7	8	

CO1 MANUAL CP
CO2 MASTER CP
CO3 CURRENT CP
CO4 LAST CP
CO7 TRNSMT CP
COD MANUAL OFFSET
CAO LOCAL CYCLE TIMER
CBO MASTER CYCLE TIMER
CAA LOCAL OFFSET
CBA MASTER OFFSET

SYSTEM MASTER:
EB @ Caliente Ave

FEATURE	OFF	ON
1		
2		
3		
4		
5		
6		
7		
8		

LOCATION	OFF	ON
1		1
2		2
3	4	
4	8	
5	16	
6	32	
7		
8		

COO = 3

CCB/CDB OFFSET TIMER
CCC/CDC LAG GREEN TIMER
CCD/CDD FORCE OFF TIMER
CCE/CDE LONG GREEN TIMER
CCF/CDF NO GREEN TIMER

LOCATION: RTE 905 @ CALIENTE AVE./OCEAN VIEW HILLS PARKWAY

CALTRANS C8 Version 3 DATE: 02/14/11

D PAGE

	D	FLAGS								E	FLAGS								F	FLAGS							
	MAX	1	2	3	4	5	6	7	8	MIN	1	2	3	4	5	6	7	8	PED	1	2	3	4	5	6	7	8
0	RCL									RCL									RCL								
1	CP 1									CP 1									CP 1								
2	CP 2									CP 2									CP 2								
3	CP 3									CP 3									CP 3								
4	CP 4									CP 4									CP 4								
5	CP 5									CP 5									CP 5								
6	CP 6									CP 6									CP 6								
7	CP 7									CP 7									CP 7								
8	CP 8									CP 8									CP 8								
9	CP 9									CP 9									CP 9								
A																			RCL 1								
B																			RCL 2								
C																											
D																											
E																											
F																											
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8

E PAGE

	E	FLAGS								F	FLAGS								
	FUNCTION	1	2	3	4	5	6	7	8	FUNCTION	1	2	3	4	5	6	7	8	
0										CODE 4									0
1										CODE 5									1
2										C-RECALL									2
3										D-RECALL									3
4										EXCLUSIVE									4
5										2 PED		2							5
6										6 PED						6			6
7										4 PED				4					7
8										8 PED								8	8
9																			9
A	OLA NOT									OLA ON									A
B	OLB NOT									OLB ON									B
C	OLC NOT									OLC ON									C
D	OLD NOT									OLD ON									D
E																			E
F																			F
		1	2	3	4	5	6	7	8		1	2	3	4	5	6	7	8	

LAST POWER FAILURE REGISTER

HOUR = D-A-E

MINUTE = D-B-E

DAY = D-C-E

RCL 1 = TIME OF DAY MAX RECALL (1ST SELECT) PHASES

(CALL ACTIVE LIGHTS)

RCL 2 = TIME OF DAY MAX RECALL (2ND SELECT) PHASES

(CALL ACTIVE LIGHTS)

LAST FLASH TIME REGISTER

HOUR = D-A-F

MINUTE = D-B-F

DAY = D-C-F

D-E-E = C8 VERSION NUMBER

D-E-F = LITHIUM BATTERY CONDITION

84 = BAD

85 = GOOD

LOCATION: **RTE 905 @ CALIENTE AVE./OCEAN VIEW HILLS PARKWAY**

CALTRANS C8 Version 3 DATE: 02/14/11

7 PAGE

TIME OF DAY ACTIVITY TABLE											
7+EVENT+HR+MIN+ACT+"E"+ON/OFF+DOW LTS											
				ON/	S	M	T	W	T	F	S
	HR	MIN	ACT	OFF	1	2	3	4	5	6	7
0	07	30	2	ON		2	3	4	5	6	
1	09	30	2	OFF		2	3	4	5	6	
2	15	30	2	ON		2	3	4	5	6	
3	17	00	2	OFF		2	3	4	5	6	
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

ACTIVITY CODE

1 TYPE OF MAX TERMINATION
2 MAX 2
3 MAX 3
4 COND SERV (1ST SELECT)
5 COND SERV (2ND SELECT)
6 ENERGIZE AUX OUTPUT-RED

7 ENERGIZE AUX OUTPUT-GREEN

8 ENERGIZE AUX OUTPUT-YELLOW

9 TIME OF DAY MAX RECALL (1ST SELECT)
A TRAFFIC ACT. MAX 2 OPERATION
B TIME OF DAY MAX RECALL (2ND SELECT)
C YELLOW YIELD COORDINATION
D YELLOW YIELD COORDINATION
E TIME OF DAY FREE OPERATION
F FLASHING OPERATION

9 PAGE C09 = 0 or 1

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
					S	M	T	W	T	F	S
	HR	MIN	CP	OS	1	2	3	4	5	6	7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

9 PAGE C09 = 2

CONTROL PLAN TIME OF DAY											
9+EVENT+HR+MIN+CP+OS+E+DOW											
					S	M	T	W	T	F	S
	HR	MIN	CP	OS	1	2	3	4	5	6	7
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
A											
B											
C											
D											
E											
F											

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	905	R9.5/R15.0	667B	857

Enrique P Bernal 08-28-09
REGISTERED ELECTRICAL ENGINEER DATE
10-20-08
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER E.P.BERNAL No. 15675 Exp. 6-30-10 ELECTRICAL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Caltrans Metric

NOTES:

1 - [RS] ALL ABOVE GROUND SIGNAL, LIGHTING AND SERVICE EQUIPMENT. UNLESS OTHERWISE NOTED.

2 - [AB] ALL CONDUIT, PULL BOXES AND DETECTOR LOOPS UNLESS OTHERWISE NOTED.

[3] - RELOCATE SIGNAL AND LIGHTING STANDARD AND APPURTENANCES COMPLETE. SEE E-19C.

[4] - RELOCATE VIDEO IMAGE SENSOR, SEE SHEET E-19C.

[5] - RELOCATE EVD, SEE SHEET E-19C.

[6] - [RS] MODEL 170 CONTROLLER ASSEMBLY, [RL] EMERGENCY VEHICLE DISCRIMINATORS AND VIDEO DETECTION SYSTEM TO NEW 332 CABINET.

[7] - Exist 1-A TO REMAIN. [RS] 5-SECTION SIGNAL HEAD. MODIFY Exist TV-1-T MOUNTING AS SHOWN SEE SHEET E-19C POLE Ⓔ.

[8] - REMOVE EXISTING 1-A FLASHING BEACON. [RC] PULL BOXES (TOTAL 15) AND [AB] CONDUIT.

[9] - [AB] EXISTING LOOPS. EXISTING CONDUIT AND PULL BOXES TO REMAIN.

[10] - REPLACE Exist PB WITH No. 6 PULL BOX. SEE SHEET E-19C.

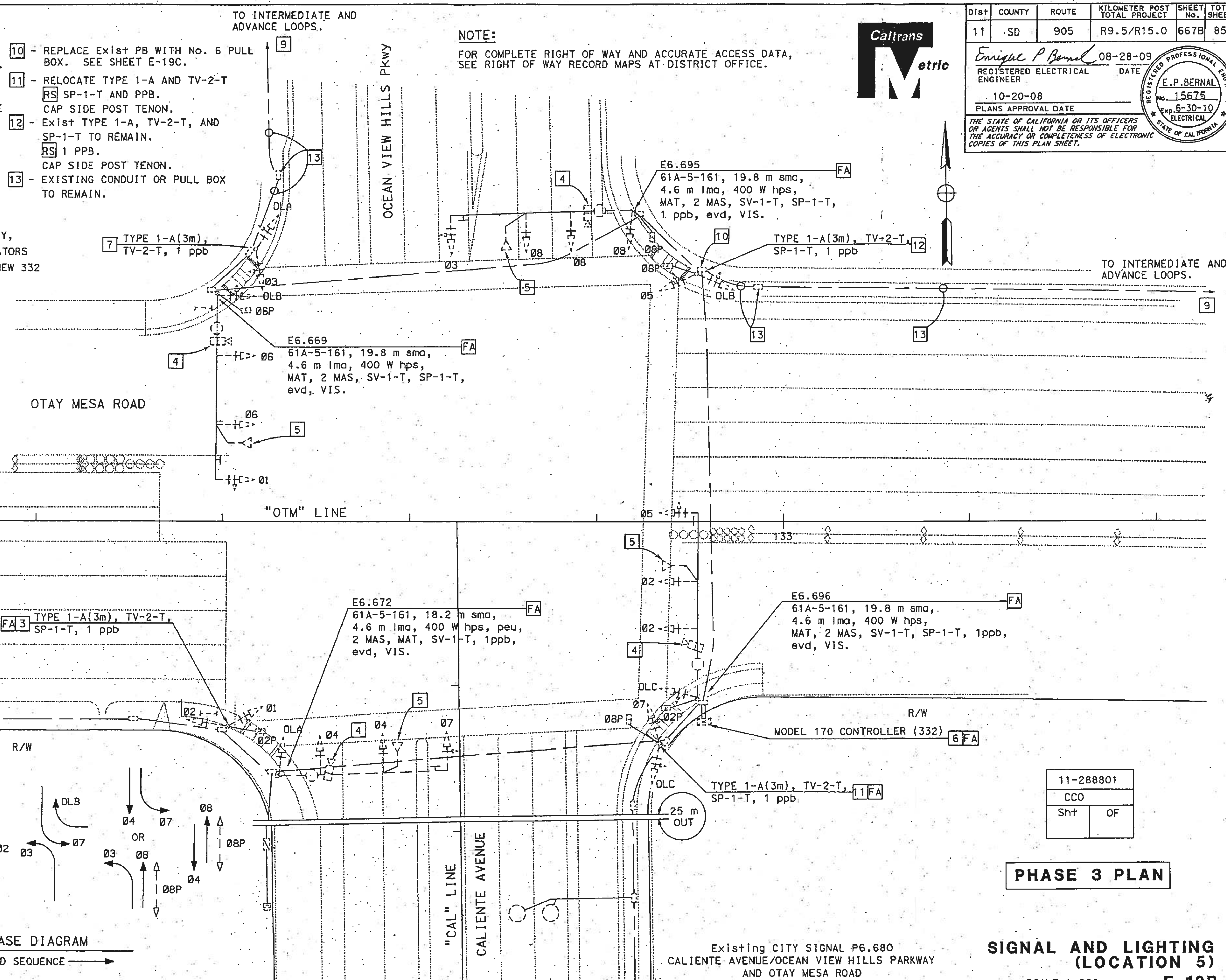
[11] - RELOCATE TYPE 1-A AND TV-2-T [RS] SP-1-T AND PPB. CAP SIDE POST TENON.

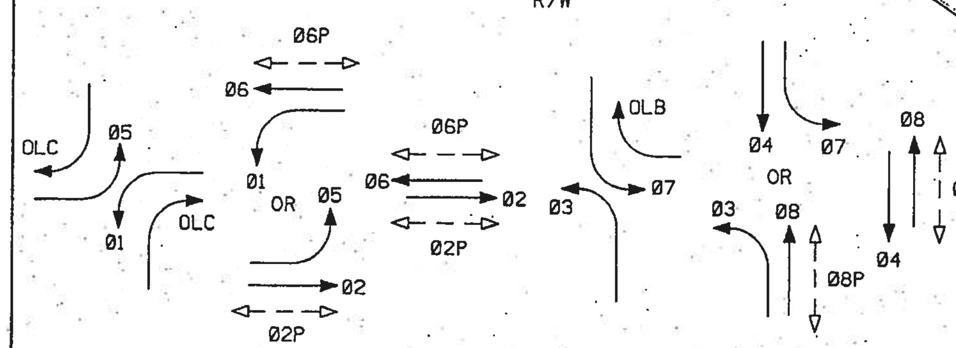
[12] - Exist TYPE 1-A, TV-2-T, AND SP-1-T TO REMAIN. [RS] 1 PPB. CAP SIDE POST TENON.

[13] - EXISTING CONDUIT OR PULL BOX TO REMAIN.

NOTE:

FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.





TRAFFIC PHASE DIAGRAM

STEADY DEMAND SEQUENCE

Existing CITY SIGNAL P6.680
CALIENTE AVENUE/OCEAN VIEW HILLS PARKWAY AND OTAY MESA ROAD

11-288801	
CCO	
Sht	OF

PHASE 3 PLAN

SIGNAL AND LIGHTING (LOCATION 5)

SCALE 1:200

E-19B

THIS PLAN SHEET ACCURATE FOR ELECTRICAL WORK ONLY. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
TRAFFIC ELECTRICAL

FUNCTIONAL SUPERVISOR: DALE WILSON
CALCULATED-DESIGNED BY: H. SAWAYA
CHECKED BY: ENRIQUE BERNAL
REVISED BY
DATE REVISED

LOCATION: 905 WB @ Caliente Ave

CALTRANS C8 Version 3 | 7/12/12 | PAGE 1

F PAGE

	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9	PRE-EMPTION E		FLAGS	F 1	2	3	4	5	6	7	8	
0	WALK	1	7	1	1	1	7	1	1	CLK RST	EV SEL	0	PERMIT		2			5	6		8	0
1	DONT WALK	1	14	1	1	1	18	1	1		RR1 CLR	15	RED LOCK									1
2	MIN GREEN	1	7	1	1	5	7	1	5		EVA DLY	0	YEL LOCK									2
3	TYPE 3 DET	0	0	0	0	0	0	0	0		EVA CLR	5	V RECALL		2				6			3
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		EVB DLY	0	P RECALL									4
5	PASSAGE	0.9	3.0	0.9	0.9	2.0	3.0	0.9	3.0		EVB CLR	5	PED PHASES		2				6			5
6	MAX GAP	0.9	3.0	0.9	0.9	2.0	3.0	0.9	3.0		EVC DLY	0	RT OLA									6
7	MIN GAP	0.9	3.0	0.9	0.9	2.0	3.0	0.9	3.0		EVC CLR	5	RT OLB									7
8	MAX EXT	9	30	9	9	15	30	9	30		EVD DLY	0	DBL ENTRY									8
9	MAX 2									YR	EVD CLR	5	MAX 2 PHASES									9
A	MAX 3									MO	MAX EV	255	LAG PHASES	READ ONLY								A
B										DAY	RR2 CLR	15	RED REST									B
C	REDUCE BY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DOW			REST-IN-WALK									C
D	EVERY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	HR			MAX 3 PHASES									D
E	YELLOW	3.0	3.6	3.0	3.0	3.2	3.6	3.0	3.6	MIN			YEL START UP		2				6			E
F	RED	0.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	SEC			FIRST PHASE								8	F
3.5'	PED XING FT		50'				50'							1	2	3	4	5	6	7	8	
	BIKE XING FT		57'				81'															

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	30
FOF	5

FCO	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FDO TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	905	R9.5/R15.0	667	857

Enrique P Bernal 08-28-09
REGISTERED ELECTRICAL ENGINEER   DATE

10-20-08
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER E.P. BERNAL No. 15675 Exp. 6-30-10 ELECTRICAL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Caltrans Metric

NOTES:

1 - TERMINATE EVC IN RED SECTION OF HOUSING. LEAVE 1 m OF SLACK.

2 - DETAIL "U" ES-7N. SEE SIGN PLANS.

3 - CONDUIT AND CABLE CONTINUOUS TO SIGNAL AND LIGHTING (LOCATION 1).

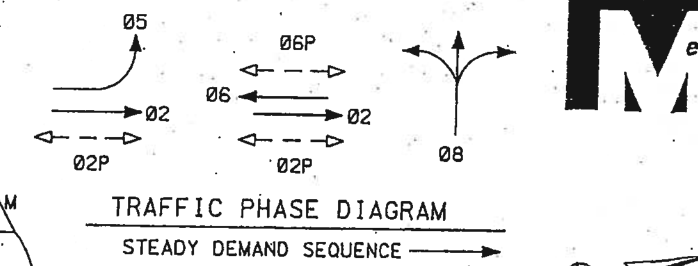
4 - FURNISH AND INSTALL VDU, COMMUNICATION CARD, AND VIDEO DISPLAY IN TYPE 332 CABINET.

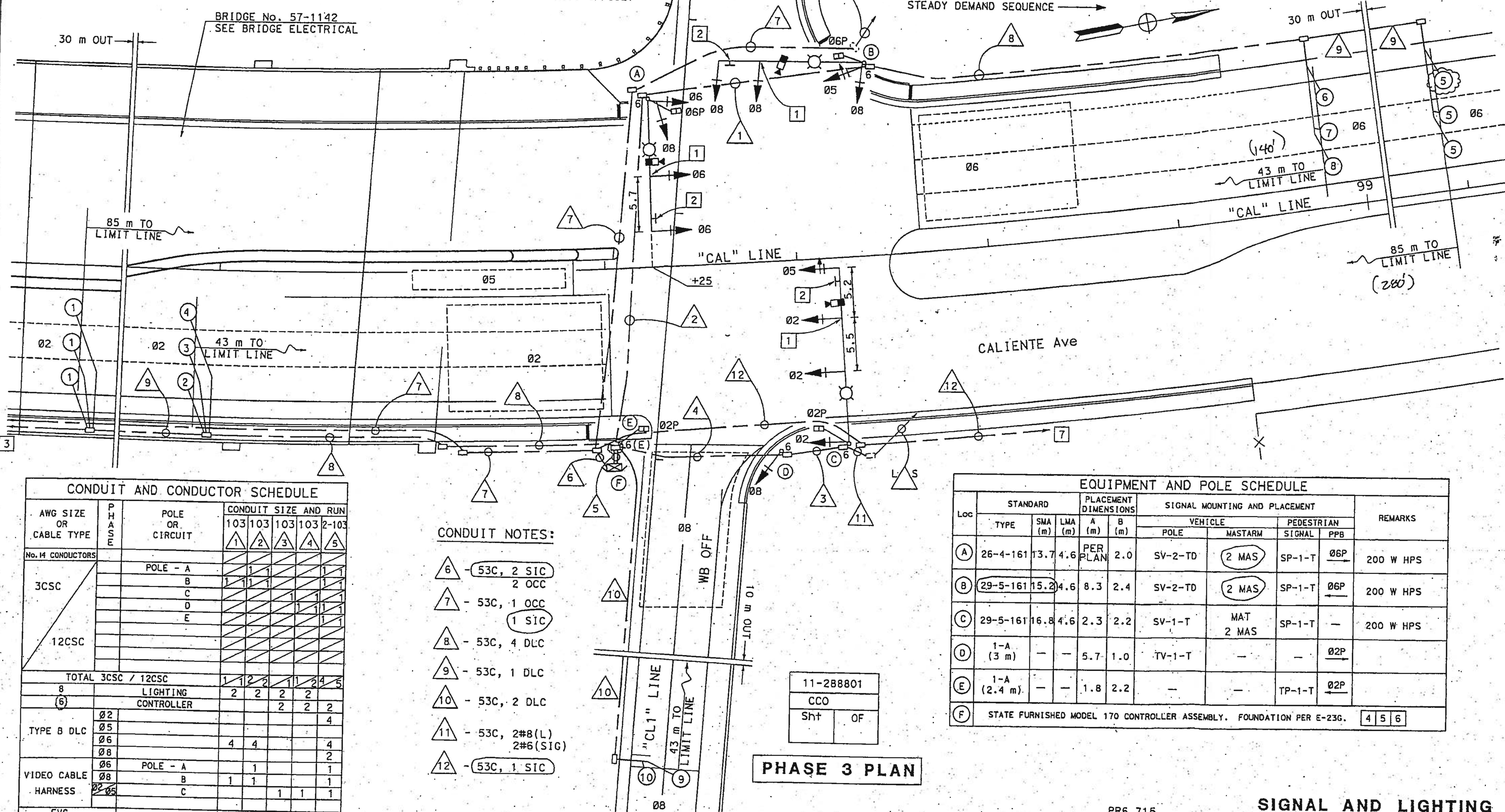
5 - FURNISH AND INSTALL COMMUNICATION EQUIPMENT PER COMPONENT DIAGRAM. SEE ELECTRICAL DETAILS.

6 - FURNISH AND INSTALL BATTERIES AND EXTERNAL BBS CABINET.

7 - CONDUIT AND CABLE CONTINUOUS TO SIGNAL AND LIGHTING (CITY LOCATION 1)

FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.





CONDUIT AND CONDUCTOR SCHEDULE

AWG SIZE OR CABLE TYPE	PHASE	POLE OR CIRCUIT	103 (1)	103 (2)	103 (3)	103 (4)	2-103 (5)
No. 14 CONDUCTORS							
3CSC / 12CSC		POLE - A		1 / 1			1 / 1
		B	1 / 1	1 / 1			1 / 1
		C			/ 1	/ 1	/ 1
		D				1 / 1	1 / 1
		E					1 / 1
TOTAL 3CSC / 12CSC			1 / 1	2 / 2	/ 1	1 / 2	4 / 5
8		LIGHTING	2	2	2	2	
6		CONTROLLER			2	2	2
TYPE B DLC	Ø2						4
	Ø5						
	Ø6		4	4			4
	Ø8						2
VIDEO CABLE HARNESS	Ø6	POLE - A		1			1
	Ø8	B	1	1			1
	Ø2/Ø5	C			1	1	1
EVC			1	2	1	1	3
TOTAL CONDUCTORS / CABLES			10	14	7	9	27

CONDUIT NOTES:

6 - 53C, 2 SIC
2 OCC

7 - 53C, 1 OCC
1 SIC

8 - 53C, 4 DLC

9 - 53C, 1 DLC

10 - 53C, 2 DLC

11 - 53C, 2#8(L)
2#6(SIG)

12 - 53C, 1 SIC

EQUIPMENT AND POLE SCHEDULE

Loc	STANDARD TYPE	SMA (m)	LMA (m)	PLACEMENT DIMENSIONS A (m)	PLACEMENT DIMENSIONS B (m)	VEHICLE POLE	VEHICLE MASTARM	PEDESTRIAN SIGNAL	PEDESTRIAN PPB	REMARKS
A	26-4-161	13.7	4.6	PER PLAN	2.0	SV-2-TD	2 MAS	SP-1-T	Ø6P	200 W HPS
B	29-5-161	15.2	4.6	8.3	2.4	SV-2-TD	2 MAS	SP-1-T	Ø6P	200 W HPS
C	29-5-161	16.8	4.6	2.3	2.2	SV-1-T	MAT 2 MAS	SP-1-T	—	200 W HPS
D	1-A (3 m)	—	—	5.7	1.0	TV-1-T	—	—	Ø2P	
E	1-A (2.4 m)	—	—	1.8	2.2	—	—	TP-1-T	Ø2P	
F	STATE FURNISHED MODEL 170 CONTROLLER ASSEMBLY. FOUNDATION PER E-23G. 4 5 6									

11-288801	
CCO	
Sht	OF

PHASE 3 PLAN

THIS PLAN SHEET ACCURATE FOR ELECTRICAL WORK ONLY.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

PR6.715
ROUTE 905 WB RAMP
AT CALIENTE AVENUE

SIGNAL AND LIGHTING (LOCATION 2)

SCALE 1:200

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	
FUNCTIONAL SUPERVISOR	DALE WILSON
CALCULATED-DESIGNED BY	H. SAWAYA
CHECKED BY	ENRIQUE BERNAL
REVISED BY	
DATE REVISED	

Caltrans TRAFFIC ELECTRICAL

LAST REVISION DATE PLOTTED => 20-DEC-2011

	INTERVAL	PHASE TIMING 1	2	3	4	5	6	7	8	9	PRE-EMPTION E		FLAGS	F 1	2	3	4	5	6	7	8	
0	WALK	1	7	1	1	1	7	1	1	CLK RST	EV SEL	0	PERMIT	1	2		4		6			0
1	DONT WALK	1	14	1	1	1	14	1	1		RR1 CLR	15	RED LOCK									1
2	MIN GREEN	5	7	1	5	1	7	1	1		EVA DLY	0	YEL LOCK									2
3	TYPE 3 DET	0	0	0	0	0	0	0	0		EVA CLR	5	V RECALL		2				6			3
4	ADD/VEH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		EVB DLY	0	P RECALL									4
5	PASSAGE	2.0	3.0	0.9	3.0	0.9	3.0	0.9	0.9		EVB CLR	5	PED PHASES		2				6			5
6	MAX GAP	2.0	3.0	0.9	3.0	0.9	3.0	0.9	0.9		EVC DLY	0	RT OLA									6
7	MIN GAP	2.0	3.0	0.9	3.0	0.9	3.0	0.9	0.9		EVC CLR	5	RT OLB									7
8	MAX EXT	15	30	9	30	9	30	9	9		EVD DLY	0	DBL ENTRY									8
9	MAX 2									YR	EVD CLR	5	MAX 2 PHASES									9
A	MAX 3									MO	MAX EV	255	LAG PHASES	READ ONLY								A
B										DAY	RR2 CLR	15	RED REST									B
C	REDUCE BY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	DOW			REST-IN-WALK									C
D	EVERY	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	HR			MAX 3 PHASES									D
E	YELLOW	3.2	3.6	3.0	3.6	3.0	3.6	3.0	3.0	MIN			YEL START UP		2				6			E
F	RED	1.0	1.0	0.0	1.0	0.0	1.0	0.0	0.0	SEC			FIRST PHASE				4					F
3.5'	PED XING FT		48'				48'							1	2	3	4	5	6	7	8	
	BIKE XING FT		67'				60'															

FOC LONG FAILURE	
FOD SHORT FAILURE	
FOE	30
FOF	5

FC0	3
FC1	3
FC2	10
FCA	0.0
FCB	0.0
FCC	0.0
FCD	0.0

FD0 TB SELECT	1
FD3 PED SELECT	0
FD4 7 WIRE	0
FD5 PERMISSIVE	0
FD8 OS SEEKING	1

CO5 FLASH TYPE	1
CC2 DOWNLOAD	1

ENTRIES IN THESE LOCATIONS CAN BE CHANGED IN CC1 FLASH ONLY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans TRAFFIC ELECTRICAL

FUNCTIONAL SUPERVISOR: DALE WILSON
CALCULATED-DESIGNED BY: H. SAWAYA
CHECKED BY: ENRIQUE BERNAL
REVISED BY
DATE REVISED

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	905	R9.5/R15.0	666	857

Enrique P Bernal 08-28-09
REGISTERED ELECTRICAL ENGINEER — DATE

10-20-08
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — E.P.BERNAL — No. 15675 — Exp. 6-30-10 — ELECTRICAL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

Caltrans Metric

CONDUIT AND CONDUCTOR SCHEDULE

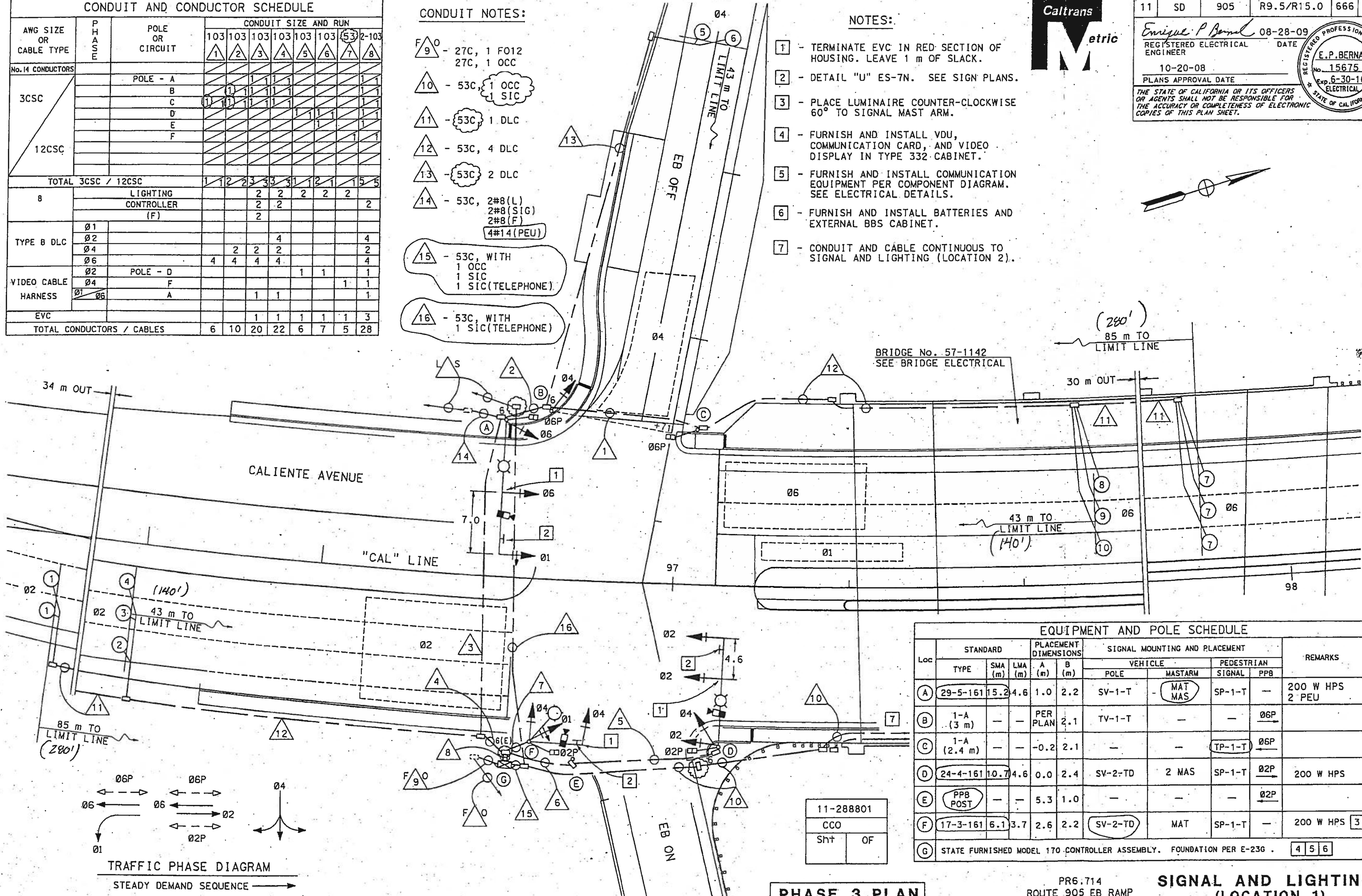
AWG SIZE OR CABLE TYPE	PHASE	POLE OR CIRCUIT	103 △1	103 △2	103 △3	103 △4	103 △5	103 △6	53 △7	2-103 △8
No. 14 CONDUCTORS										
3CSC / 12CSC		POLE - A			1/1	1/1				1/1
		B		1/1	1/1	1/1				1/1
		C	1/1	1/1	1/1	1/1				1/1
		D					1/1	1/1		1/1
		E						1/		1/
		F							/1	/1
TOTAL 3CSC / 12CSC			1/1	2/2	3/3	3/3	1/1	2/1	/1	5/5
8		LIGHTING			2	2	2	2	2	
		CONTROLLER			2	2				2
		(F)			2					
TYPE B DLC	Ø1									
	Ø2					4				4
	Ø4			2	2	2				2
	Ø6		4	4	4	4				4
VIDEO CABLE HARNESS	Ø2	POLE - D					1	1		1
	Ø4	F							1	1
	Ø1/Ø6	A			1	1				1
EVC					1	1	1	1	1	3
TOTAL CONDUCTORS / CABLES			6	10	20	22	6	7	5	28

CONDUIT NOTES:

- F/9\O - 27C, 1 FO12; 27C, 1 OCC
- 10 - 53C, 1 OCC, 1 SIC
- 11 - 53C, 1 DLC
- 12 - 53C, 4 DLC
- 13 - 53C, 2 DLC
- 14 - 53C, 2#8(L), 2#8(SIG), 2#8(F), 4#14(PEU)
- 15 - 53C, WITH 1 OCC, 1 SIC, 1 SIC(TELEPHONE)
- 16 - 53C, WITH 1 SIC(TELEPHONE)

NOTES:

1. TERMINATE EVC IN RED SECTION OF HOUSING. LEAVE 1 m OF SLACK.
2. DETAIL "U" ES-7N. SEE SIGN PLANS.
3. PLACE LUMINAIRE COUNTER-CLOCKWISE 60° TO SIGNAL MAST ARM.
4. FURNISH AND INSTALL VDU, COMMUNICATION CARD, AND VIDEO DISPLAY IN TYPE 332 CABINET.
5. FURNISH AND INSTALL COMMUNICATION EQUIPMENT PER COMPONENT DIAGRAM. SEE ELECTRICAL DETAILS.
6. FURNISH AND INSTALL BATTERIES AND EXTERNAL BBS CABINET.
7. CONDUIT AND CABLE CONTINUOUS TO SIGNAL AND LIGHTING (LOCATION 2).



EQUIPMENT AND POLE SCHEDULE

Loc	STANDARD TYPE	SMA (m)	LMA (m)	PLACEMENT DIMENSIONS A (m)	PLACEMENT DIMENSIONS B (m)	VEHICLE POLE	VEHICLE MASTARM	PEDESTRIAN SIGNAL	PEDESTRIAN PPB	REMARKS
A	29-5-161	15.2	4.6	1.0	2.2	SV-1-T	- MAT MAS	SP-1-T	—	200 W HPS 2 PEU
B	1-A (3 m)	—	—	PER PLAN	2.1	TV-1-T	—	—	Ø6P →	
C	1-A (2.4 m)	—	—	-0.2	2.1	—	—	TP-1-T	Ø6P ←	
D	24-4-161	10.7	4.6	0.0	2.4	SV-2-TD	2 MAS	SP-1-T	Ø2P →	200 W HPS
E	PPB POST	—	—	5.3	1.0	—	—	—	Ø2P ←	
F	17-3-161	6.1	3.7	2.6	2.2	SV-2-TD	MAT	SP-1-T	—	200 W HPS 3
G	STATE FURNISHED MODEL 170 CONTROLLER ASSEMBLY. FOUNDATION PER E-23G.									4 5 6

11-288801	
CCO	
Sht	OF

PHASE 3 PLAN

PR6.714
ROUTE 905 EB RAMP
AT CALIENTE AVENUE

SIGNAL AND LIGHTING (LOCATION 1)

SCALE 1:200

E-18

THIS PLAN SHEET ACCURATE FOR ELECTRICAL WORK ONLY. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

APPENDIX J

- Conceptual Striping Plans for Caliente Avenue and Airway Road

GEOLOGIC MAP

CANDLELIGHT VILLAS PHASE 1
SAN DIEGO, CALIFORNIA

GEOCON INCORPORATED
GEOTECHNICAL CONSULTANTS
6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974
PHONE 858 558-6900 - FAX 858 558-6159

SCALE 1" = 60'	DATE 06 - 02 - 2004
PROJECT NO. 07177 - 52 - 02	FIGURE 2
SHEET 1 OF 2	

E:\2004\7177_AS1.DWG/aml

SEE FIGURE 2

GEOLOGIC MAP

CANDLELIGHT VILLAS PHASE 1

SAN DIEGO, CALIFORNIA

GEOCON INCORPORATED GEOTECHNICAL CONSULTANTS 6960 FLANDERS DRIVE - SAN DIEGO, CALIFORNIA 92121 - 2974 PHONE 858 558-6900 - FAX 858 558-6159	SCALE 1" = 60'	DATE 06 - 02 - 2004	FIGURE 3
	PROJECT NO. 07177 - 52 - 02		
	SHEET 2 OF 2		

E:\2004\7177_AS1.DWG/aml

Schwerin & Assoc.
814 Morena Blvd., Ste.101, San Diego, Ca 92110
Phone (619) 220-4969 Fax (619) 220-7029
www.schwerin-assoc.com

June 8, 2015

To Whom it May Concern:

The City of San Diego's Transportation Department during its review of the EIR, discovered that the traffic calculations for the Traffic Impact Analysis used "greater than 20 dwelling units per acre" as a basis its calculations; while the Tentative Map used 19.93 (rounded up to 20) dwelling units per acre.

In order for the traffic calculations in the Traffic Impact Analysis report to be accurate and match the EIR, the dwelling units per acre must be "greater than" 20.

Therefore, the Tentative Map was updated to reflect a decrease of .09 acres for the developable acres (Lot 1 was decreased by .09 acres and Lot 4 (MHPA) increased). This increased the dwelling units per acre to 20.008 and required the following changes to the Tentative Map:

Area affected	Previous Tentative Map acres/units	Updated Tentative Map acres/units
Lot 1 acres	7.81 acres	7.72 acres
Dwelling unit per acre	19.93 dwelling units per acre	20.008 dwelling units per acre
Developable acres	23.83 acres	23.74 acres
Lot 4 acres	15.76 acres	15.85 acres
Total open space acres	17.86 acres	17.95 acres
Total open space rounded	17.9 acres	18 acres
Total developable acres rounded	23.8 acres	23.7 acres

This update to the Tentative Map made the environmental impact LESS than previously stated. Therefore, it was determined that the reports for this EIR would not need to be re-written/updated to reflect this negligible change of .09 acres on the Tentative Map.

Also note, some reports state that 476 dwelling units would be built and others studied impacts of 475 units. Therefore, 475 dwelling units will be used to be consistent. Some reports may show 476 units. The lower dwelling unit number would cause LESS of an environmental impact.

The attached report may have acres/units which do not reflect the latest Tentative Map updates described above. However, please note the current impact is less that the report may state and therefore, not considered a significant change requiring a report re-write.

Sincerely,

Kathy Corvin
Schwerin & Assoc.
(619) 220 4969

Appendix M

Will-Serve Letter, San Diego Water Department
Aug. 2005

THE CITY OF SAN DIEGO

August 16, 2005

Mr. Todd Engstrand
PBS&J
9275 Sky Park Court, Suite 200
San Diego, CA 921237

Subject: Will Serve Letter - Candlelight Developments (TM 42-2966 & 42-3426)

Dear Mr. Engstrand:

This letter is to confirm that the above reference developments are within the City of San Diego water service area. The developments will have water facilities for its use in Caliente Avenue as identified in the subject development's tentative map, once the subject development have completed the construction of the required water facilities and received the operational acceptance from the City of San Diego's Water Department. The proposed water facilities for the subject developments are consistent with the approved water facilities master plan for the subject development's water service area.

If you have any other questions or concerns, please call me at (619) 533-7417.

Sincerely,

Chris Gascon, P.E.
Associate Civil Engineer

cc: Leonard Wilson, Senior Civil Engineer, Water Department
Hooman Partow, Associate Civil Engineer, Water Department

Appendix N

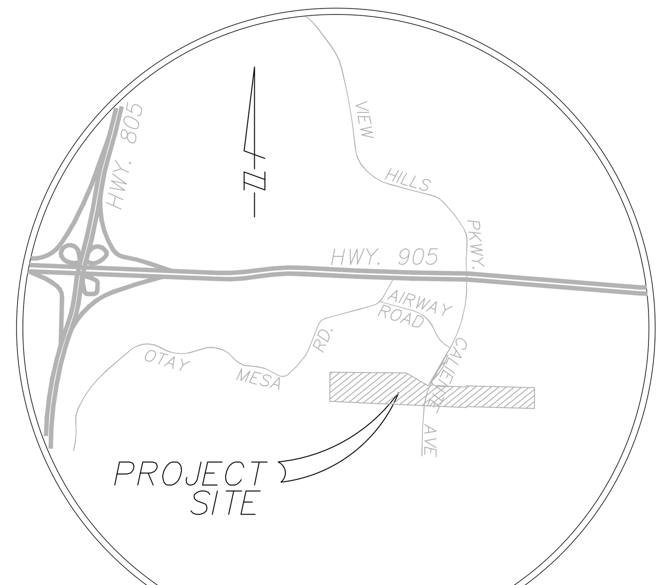
Tentative Map, Planned Development Permit and Site Development Permit, ~~Aug. 2015~~January 2018

PROJECT NO. 40329

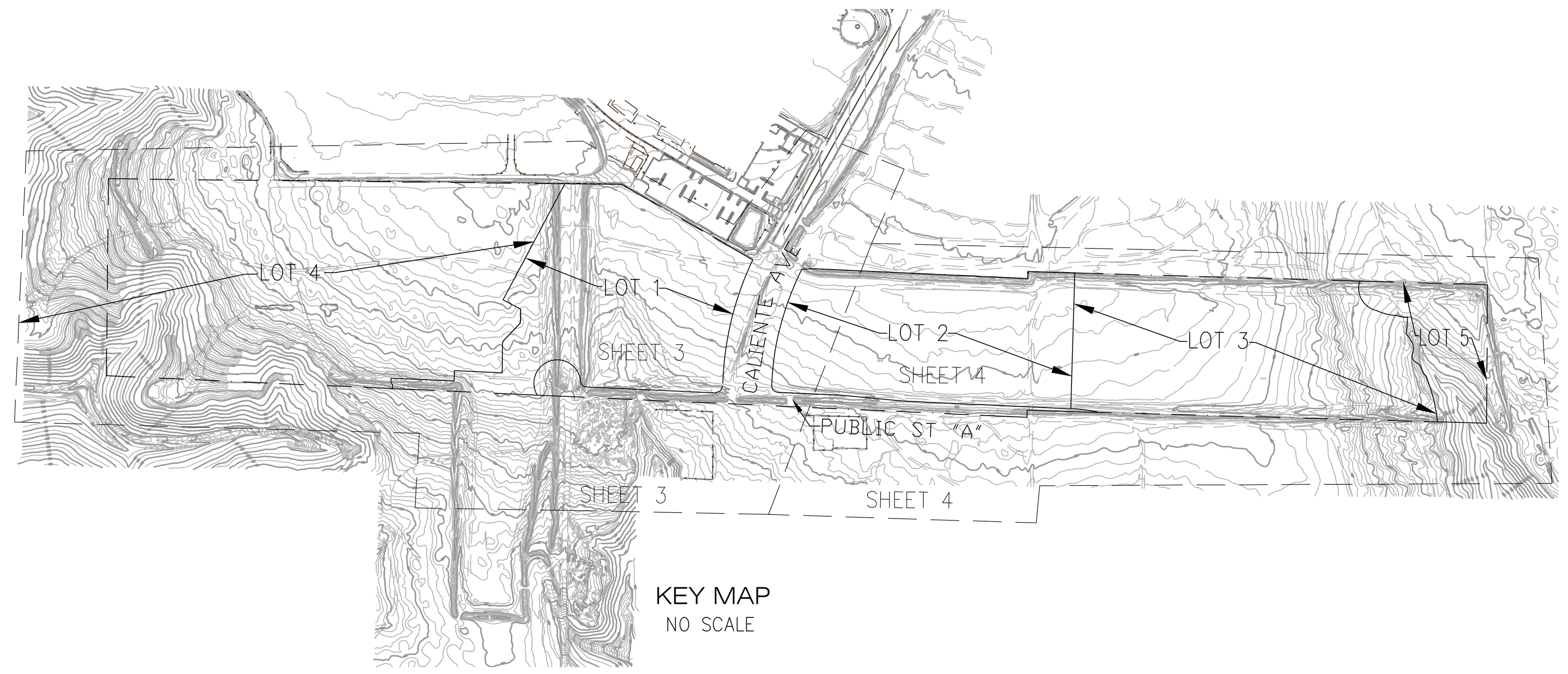
TENTATIVE MAP, SITE DEVELOPMENT PLAN, PLANNED DEVELOPMENT PERMIT

CANDLELIGHT

CITY OF SAN DIEGO, CALIFORNIA



VICINITY MAP
NOT TO SCALE



KEY MAP
NO SCALE

PUBLIC UTILITIES

WATER ....CITY OF SAN DIEGO
SEWER.........................CITY OF SAN DIEGO
FIRE AND POLICE..............CITY OF SAN DIEGO
GAS & ELECTRICITY............SDG&E
TELEPHONE....................AT&T OR COX
SCHOOL DISTRICTS.............SWEETWATER UNION HIGH SCHOOL DISTRICT
SCHOOL DISTRICTS.............SAN YSIDRO SCHOOL DISTRICT

LEGAL DESCRIPTION

PARCEL A1:
A PORTION OF THE WEST HALF OF THE NORTHEAST QUARTER OF SECTION 31, TOWNSHIP 18, SOUTH RANGE 1 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO OFFICIAL PLAT THEREOF.

PARCEL C1:
A PORTION OF THE SOUTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 31, TOWNSHIP 18 SOUTH, RANGE 1 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO OFFICIAL PLAT THEREOF.

PARCEL C2:
THE NORTHERLY 400.00 FEET OF SOUTHERLY 420.00 FEET OF THE WEST HALF OF THE NORTHWEST QUARTER OF SECTION 32, TOWNSHIP 18 SOUTH, RANGE 1 WEST, SAN BERNARDINO MERIDIAN, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO OFFICIAL PLAT THEREOF, MEASURED AT RIGHT ANGLES TO THE SOUTHERLY LINE OF SAID NORTHWEST QUARTER OF SECTION 32.

DEVELOPMENT SUMMARY

THE PROPOSED DEVELOPMENT IS A FIVE LOT SUBDIVISION FOR THE INTENDED USE OF MULTI FAMILY DEVELOPMENT. TOTAL ACREAGE IS 44.19. LOT 1= 7.72 AC, LOT 2= 7.15 =AC, LOT 3= 8.87 AC, TOTALING 23.74 AC. DISCRETIONARY ACTIONS BEING REQUESTED AT THIS TIME ARE FOR A SITE DEVELOPMENT PERMIT, AND TENTATIVE MAP. TWO ENVIRONMENTAL PRESERVES ARE BEING PROPOSED TOTALING 17.95 ACRES: LOT 4=15.85 & LOT 5 =2.10 AC + ROADS =2.50. THE AFOREMENTIONED SITE DEVELOPMENT PERMIT IS FOR THE FIVE LOTS: THREE RESIDENTIAL LOTS, TWO ENVIRONMENTAL PRESERVE LOTS & PUBLIC ROADWAYS.

REQUIRED DATA

EXISTING ZONING: RM-2-5
PROPOSED ZONING: RM-2-5 (29 DU/AC.)
AREA: 49.19 (TOTAL OWNERSHIP, INCLUDING 5.0 AC LEGAL PARCEL B-NOT INCLUDED IN THIS TENTATIVE MAP APPLICATION)
AREA TO BE SUBDIVIDED: 24.19 ACRES
ENVIRONMENTAL PRESERVES: 2 TOTALING 17.95 AC
PROPOSED NUMBER OF LOTS: 5 (INCLUDING 2 PRESERVES)
LAMBERT COORDINATES: 146N, 1765.5E
ASSESSOR'S PARCEL NUMBERS:
645-060-32/35/38, 645-080-08
TYPE OF CONSTRUCTION: TYPE V RATED
OCCUPANCY CLASSIFICATION: MULTI-FAMILY RESIDENTIAL
PROPOSED USE: RESIDENTIAL (CONDOMINIUMS)
EXISTING USE: VACANT ACREAGE

OTHER

FOR TYPICAL STREET SECTIONS OF CALIENTE AVE, AND PUBLIC STREET "A" SEE THIS SHEET.

LANDSCAPE NOTE:

NO TREES WILL BE INSTALLED WITHIN 10 FEET OF WATER OR SEWER FACILITIES.

NO INVASIVE PLANTS WILL BE USED.

NO RECYCLED WATER IS AVAILABLE, SYSTEM WILL BE SET UP TO CONVERT TO RECYCLED WATER ONCE AVAILABLE.

GRADING TABULATIONS:

GRADING PROPOSED FOR LOTS 1-3:
AMOUNT OF CUT = 26,400 CUBIC YARDS
AMOUNT OF FILL = 26,400 CUBIC YARDS
MAXIMUM HEIGHT OF CUT = 3', MAXIMUM HEIGHT OF FILL = 3'
THE AMOUNT OF AREA TO BE GRADED IS 100% OF LOTS 1, 2 & 3 & ROADS.
AREA OF SLOPES EXCEEDING 25% IS 0.0 ACRES
SLOPE ANALYSIS:
SLOPES LESS THAN 25%= 23.83 AC (100%)
SLOPES 25% TO 35%= 0.0 AC (0.0%)
SLOPES GREATER THAN 35%= 0.0 AC (0.0%)
GRADING NOTE: NO IRRIGATION RUN OFF SHALL DRAIN INTO THE PUBLIC RIGHT OF WAY, STREET, DRIVES ALLEYS OR ADJACENT PROPERTIES. NO CONNECTION SHALL BE MADE TO ANY STORM WATER SYSTEM WITHOUT PROPER BMP'S.
AREAS/ACRES TO BE GRADED: CALIENTE AVENUE = 1.20 AC,
PUBLIC STREET "A" = 1.30AC, LOT 1= 7.81 AC, LOT 2= 7.15 AC, LOT 3=8.87 AC

CONDOMINIUM NOTE:

THIS SUBDIVISION IS A CONDOMINIUM PROJECT AS DEFINED IN SECTION 1425 ET. SEQ. OF THE CIVIL CODE OF THE STATE OF CALIFORNIA AND IS FILED PURSUANT TO THE SUBDIVISION MAP ACT. A MAXIMUM OF 476 RESIDENTIAL CONDOMINIUMS ON THE THREE LOT SUBDIVISION IS PROPOSED. MAXIMUM ALLOWED PER ZONING IS AS FOLLOWS: LOT 1-224 DUA, LOT 2 -208, AND LOT 3 - 258, TOTAL ALLOWED PER ZONING = 690.

TOPOGRAPHY:

TOPOGRAPHY FOR THIS TENTATIVE MAP PERFORMED ON 1-08-2004 BY DAVID W. AMBLER, HUNSAKER AND ASSOC. 9707 Waples St San Diego, CA 92121-2954

UTILITY TABLE

UTILITY	PROVIDER	UNDERGROUNDED
GAS & ELECTRICITY	SDG&E	UNDERGROUND
CABLE/INTERNET	COX	UNDERGROUND
TELEPHONE	AT&T OR COX	UNDERGROUND

SHEET INDEX

BENCHMARK

STANDARD BRASS DISK IN WELL MONUMENT AT CENTERLINE INTERSECTION OF OTAY MESA ROAD AND HERITAGE ROAD ELEVATION: 504.468 MSL

BASIS OF BEARINGS

WILL BE COMPLETED WITH THE FINAL MAP.

PROJECT TEAM

CIVIL ENGINEER/APPLICANT:
SCHWERIN & ASSOC.
814 MORENA BLVD.
101
SAN DIEGO, CA. 92101
(619) 220-4969

ARCHITECT:
RODRIGUEZ ASSOCIATES
CARLOS RODRIGUEZ, ARCHITECT
2445 FIFTH AVENUE,
STE 220
SAN DIEGO, CA 92101
(619) 544-8951

GREENHOUSE GAS CONSULTANT:
HELIX ENVIRONMENTAL PLANNING
7578 EL CAJON BLVD,
STE 200
LA MESA, CA. 91942
(619) 462-1515

ENVIRONMENTAL CONSULTANT:
ALDEN ENVIRONMENTAL, INC
3245 UNIVERSITY AVE., #1188,
SAN DIEGO, CA 92104
(619)284-3815

LANDSCAPE ARCHITECT:
GREGG STOCKWELL & ASSOC, INC.
P.O. BOX 1056
POWAY, CA 92074
(858) 748-3350

TRAFFIC ENGINEER:
LEO ESPELET
KIMLEY-HORN
401 B STREET, STE 600
SAN DIEGO, CA 92101

WATER RESOURCES:
SBO INC. PLANNING, ENGINEERING, SURVEYING
3990 RUFFIN ROAD, STE. 120
SAN DIEGO, CA. 92123
(858) 560-1141

ENGINEER/APPLICANT:
Schwerin & Assoc.
Civil Engineering • Planning
Engineered Construction
814 Morena Blvd., Ste.101, San Diego, Ca 92110
Phone (619) 220-4969 Fax (619) 220-7029

REGISTERED PROFESSIONAL ENGINEER
WALTER T. SCHWERIN
No. 22139
Exp. 9-30-19
CIVIL
STATE OF CALIFORNIA

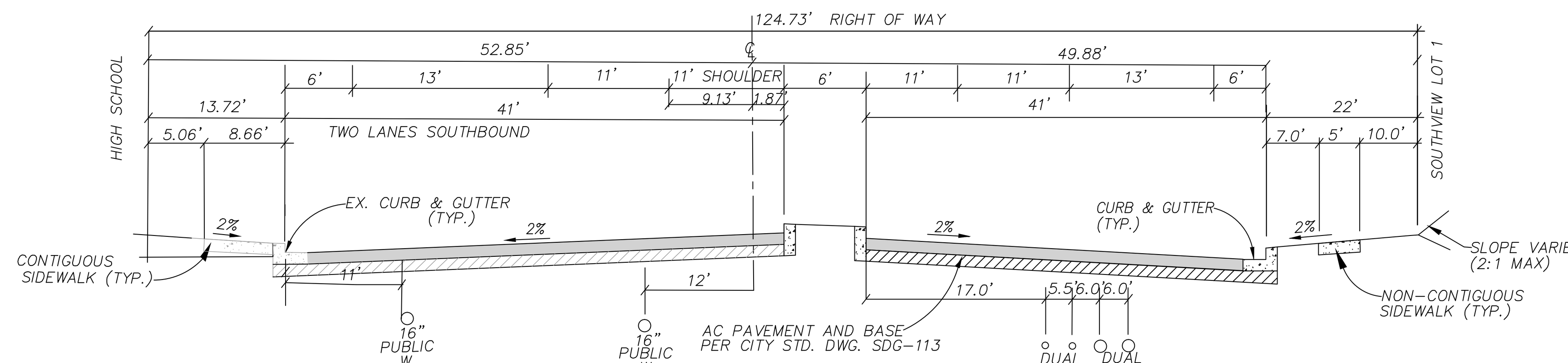
WALTER T. SCHWERIN RCE 22139

OWNER/ DEVELOPER
CANLDELIGHT, LLC
BY CLEM ABRAMS
8015 N. LA JOLLA SCENIC DR.
LA JOLLA, CA. 92037
PHONE: (858) 455-5055

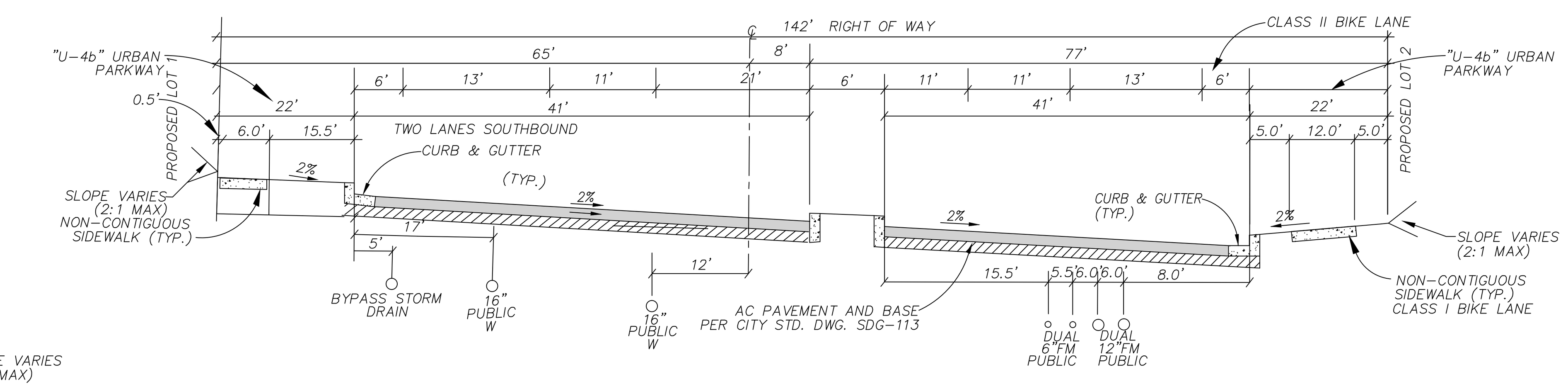
CLEM ABRAMS, CANLDELIGHT LLC

LEGEND

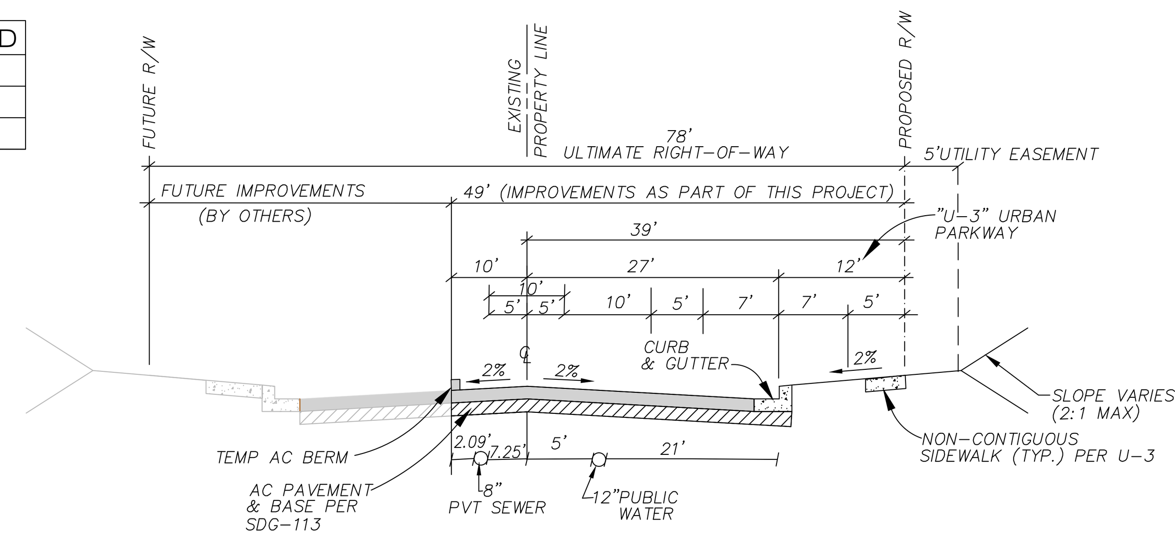
EXISTING EASEMENT
SUBDIVISION BOUNDARY
PROPOSED LOTLINE/ROW
CENTERLINE
SETBACK
WATERSHED AREA
VP, VP/BASIN WITH SHRIMP
MHPA LINE
PRO. WATER LINE
EX. WATER LINE
PRO. SEWER LINE/SFM
EX. SEWER LINE
FIRE HYDRANT
EXIST. CONTOUR LINE
530 EXIST. INDEX CONTOUR LINE
SLOPE INDICATOR
PROPOSED FENCING, PER PLANS
PRO DRIVEWAY
PRO SDWK, CURB, GTR(TYPE H)
PRO MEDIAN
REMOVE PORTION OF EX. MEDIAN
CURB RAMP
PROPOSED STORM DRAIN
PRO. FUTURE PUMP STATION
PROPOSED CURB INLET & PIPING PER D-01
PROPOSED CURB INLET PIPING
PROPOSED HEADWALL
PROPOSED SEWER PLUGS
PRO. ZONE 1 BRUSH MANAGEMENT
PUBLIC TRAIL ACCESS EASEMENT
MHPA
CITY MAINT. ACCESS EASEMENT
EXISTING SURVEY MONUMENT AS NOTED
TRAFFIC SIGNAL WITH STREET LIGHT
PRO STREET LIGHT
EX. STREET LIGHT
RELINQUISHMENT OF ACCESS ACCESS RIGHTS
ROCK RIP RAP
ELECTRIC CHARGING STATION PARKING SPACES
PRO. IRREVOCABLE OFFER TO DEDICATE FOR STREET PURPOSES



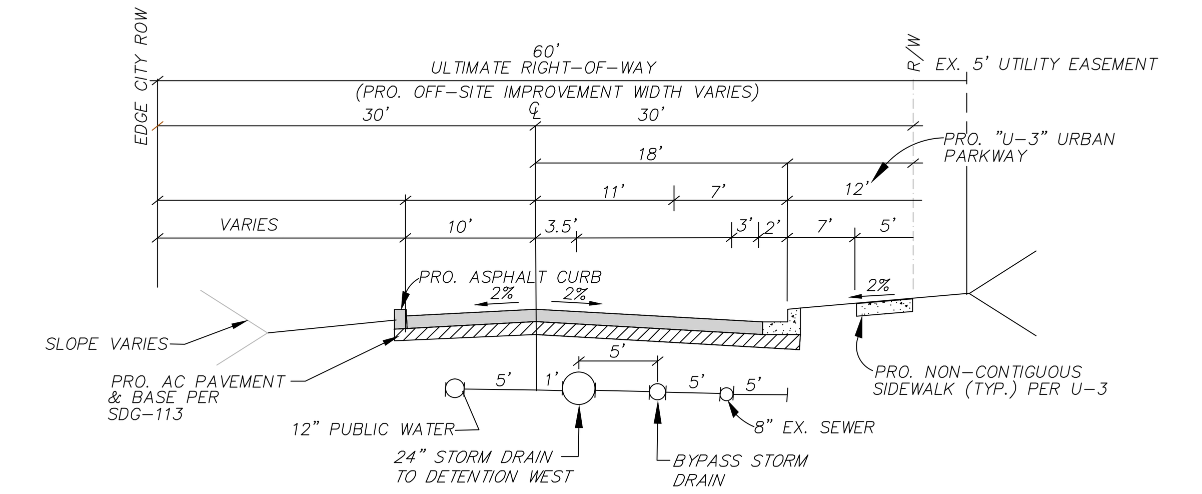
CALIENTE AVENUE (OFF-SITE)
STRIPED FIVE LANE INTERIM PLAN-@ 32+41
NO ON STREET PARKING PROPOSED
45 MPH DESIGN SPEED
NOT TO SCALE



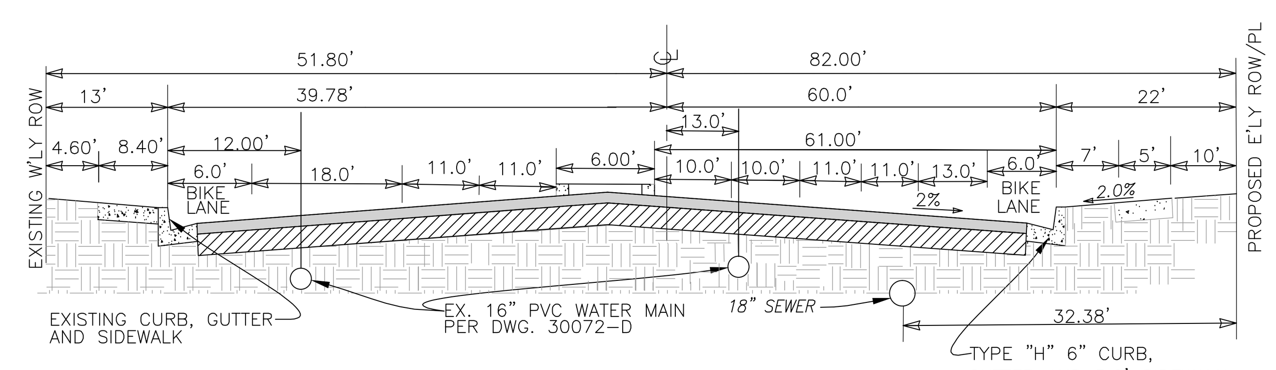
CALIENTE AVENUE (ON-SITE)
STRIPED FIVE LANE INTERIM PLAN@ 36+25
NO ON STREET PARKING PROPOSED
NOT TO SCALE



PUBLIC STREET "A"
TWO LANE COLLECTOR W/ TWO WAY LEFT TURN LANE
EAST OF CALIENTE AVENUE TO 12+77.20
NOT TO SCALE



PUBLIC STREET 'A'
TWO LANE COLLECTOR WEST
OF CALIENTE AVE. 4+86.85 TO 9+48.65
NOT TO SCALE
SEE ALSO SECTIONS B-B AND C-C, SHEET 4 SOUTHWIND WILL COORDINATE UTILITY LOCATIONS WITH CANDLELIGHT



CALIENTE AVE. @ STA: 26+15
(INTERIM STRIPING- OFFSITE)
NOT TO SCALE

PREPARED BY:
Schwerin &Assoc.
Civil Engineering • Planning
Engineered Construction
814 Morena Blvd., Ste.101, San Diego, Ca 92110
Phone (619) 220-4969 Fax (619) 220-7029

#	REVISIONS	DATE	BY
1.	1ST SUBMITTAL	3/27/12	SA
2.	2nd SUBMITTAL	11/20/12	SA
3.	3rd SUBMITTAL	04/24/12	SA
4.	4TH SUBMITTAL	07/12/13	SA
5.	5TH SUBMITTAL	09/9/13	SA
6.	6TH SUBMITTAL	11/13/14	SA
7.	7TH SUBMITTAL	7/15/15	SA
8.	8TH SUBMITTAL	8/24/15	SA
9.	9TH SUBMITTAL	12/3/17	SBO
10.	10TH SUBMITTAL	01/11/18	SBO
11.			
12.			
13.			
14.			

PROJECT ADDRESS:
CALIENTE AVE., SOUTH OF OTA MESA ROAD, NEAR THE INTERSECTION OF AIRWAY ROAD.

DEEP #PROJECT #: 40329
WORK ORDER #:
TENTATIVE MAP #:114999

TENTATIVE MAP, SDP SITE/GRADING
COVER SHEET & STREET SECTIONS

CANDLELIGHT
CITY OF SAN DIEGO, CALIFORNIA

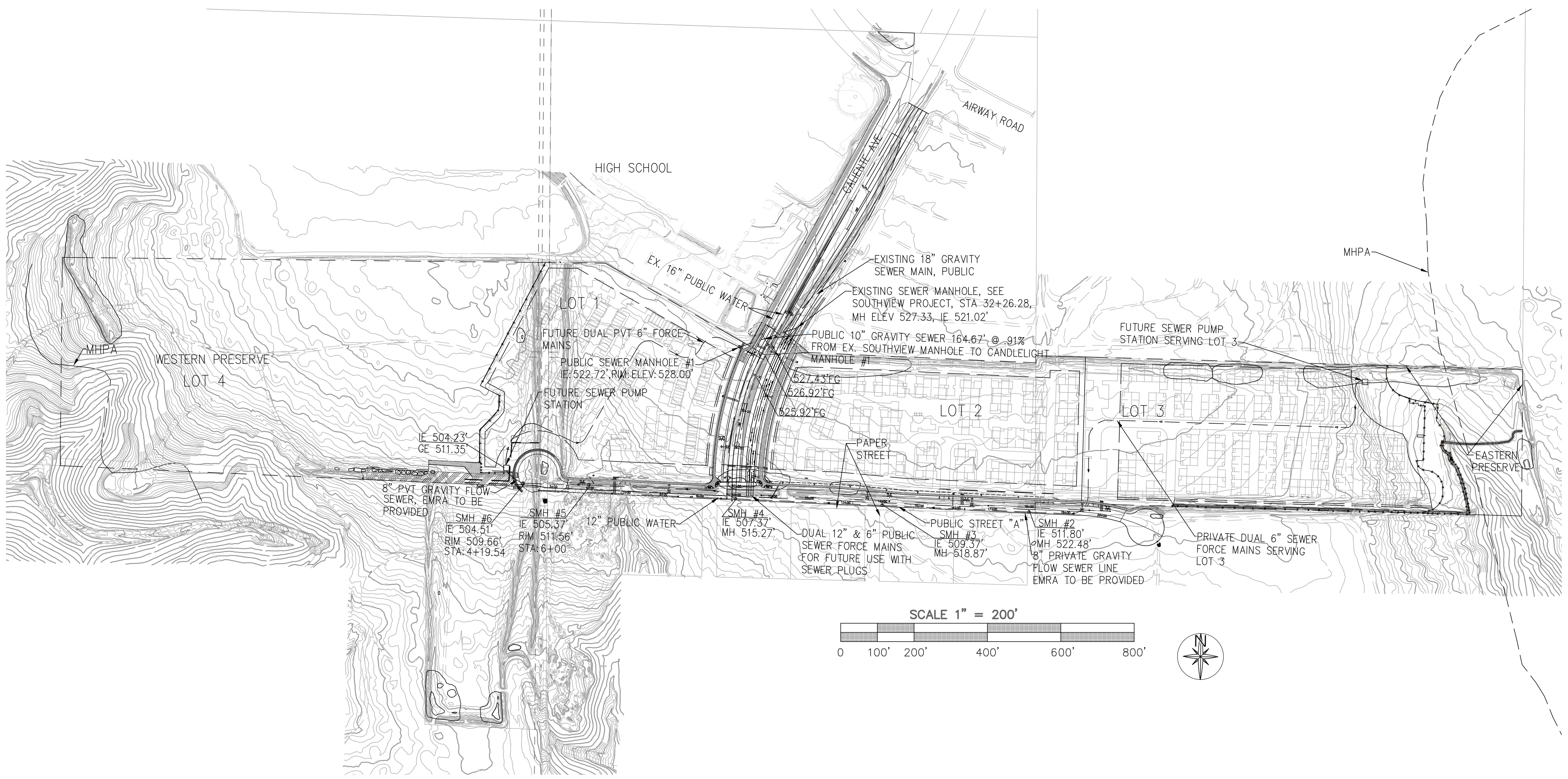
SHEET S-1 OF S-8

TENTATIVE MAP, and SDP SITE/GRADING PLAN

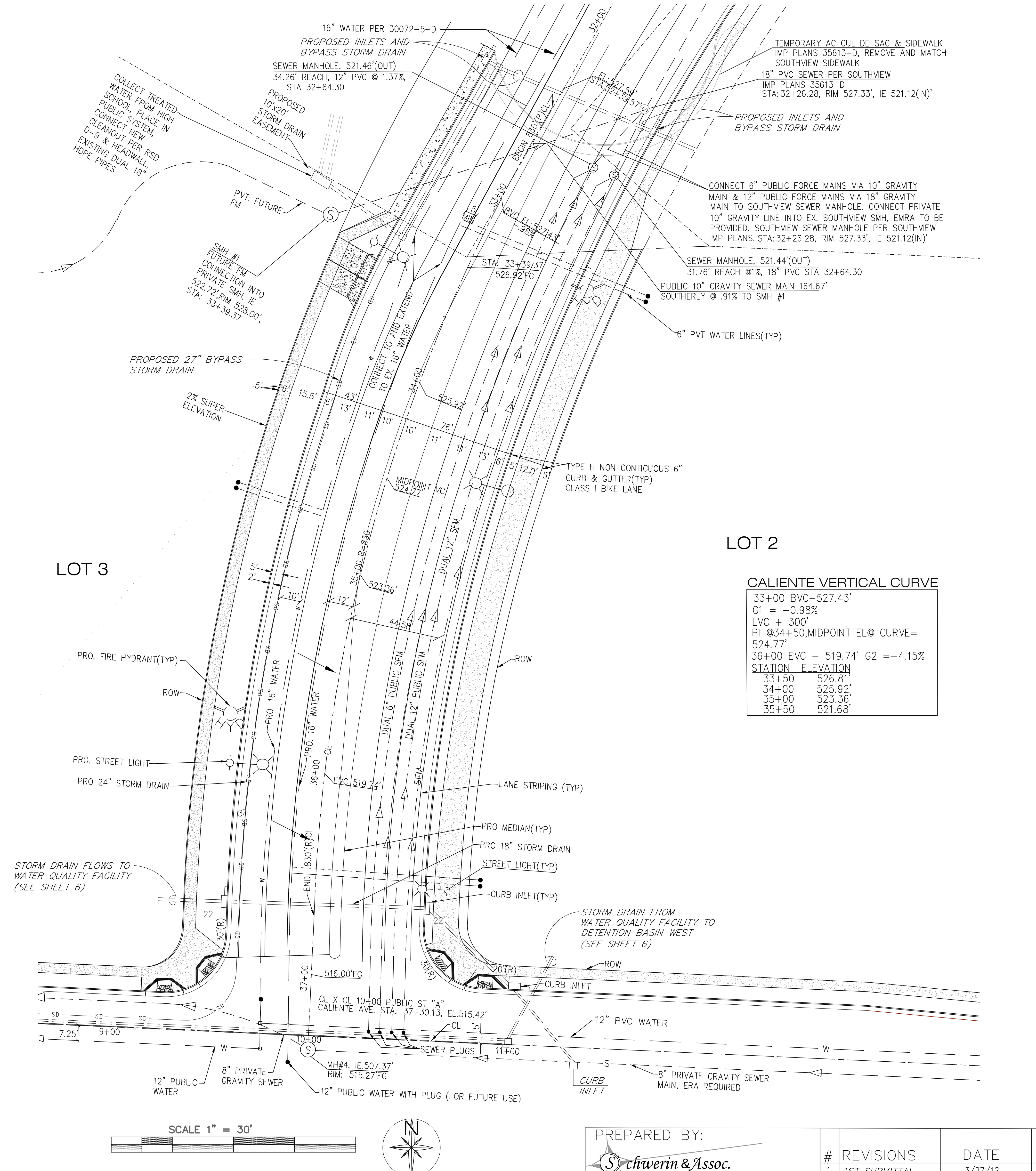
CANDLELIGHT

CITY OF SAN DIEGO, CALIFORNIA

SEWER SCHEMATIC



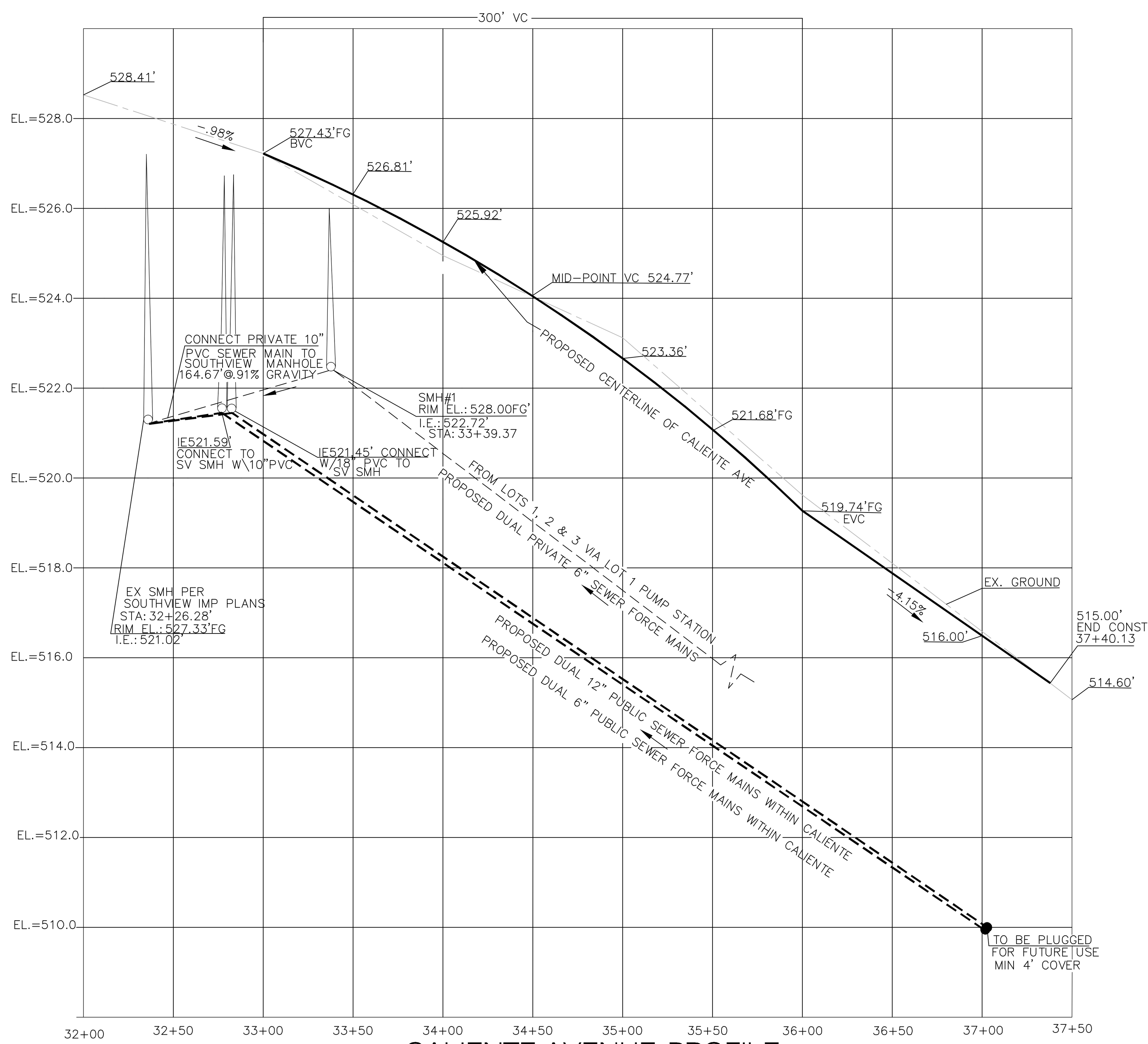
DETAIL CALIENTE AVENUE



CALIENTE VERTICAL CURVE

33+00 BVC–527.43'
G1 = –0.98%
LVC + 300'
PI @34+50,MIDPOINT EL@ CURVE= 524.77'
36+00 EVC – 519.74' G2 =–4.15%

STATION	ELEVATION
33+50	526.81'
34+00	525.92'
35+00	523.36'
35+50	521.68'



CALIENTE AVENUE-PROFILE

HORIZ. SCALE: 1"=50' VERT. SCALE: 1"=2'

PREPARED BY:
Schwerin & Assoc.
Civil Engineering • Planning
Engineered Construction
814 Morena Blvd., Ste.101, San Diego, Ca 92110
Phone (619) 220-4969 Fax (619) 220-7029
WALTER T. SCHWERIN RCE 22139

PROJECT ADDRESS:
CALIENTE AVE., SOUTH OF OTAY MESA ROAD, NEAR THE INTERSECTION OF AIRWAY ROAD.

DEP #: PROJECT #: 40329
WORK ORDER #:

#	REVISIONS	DATE	BY
1.	1ST SUBMITTAL	3/27/12	SA
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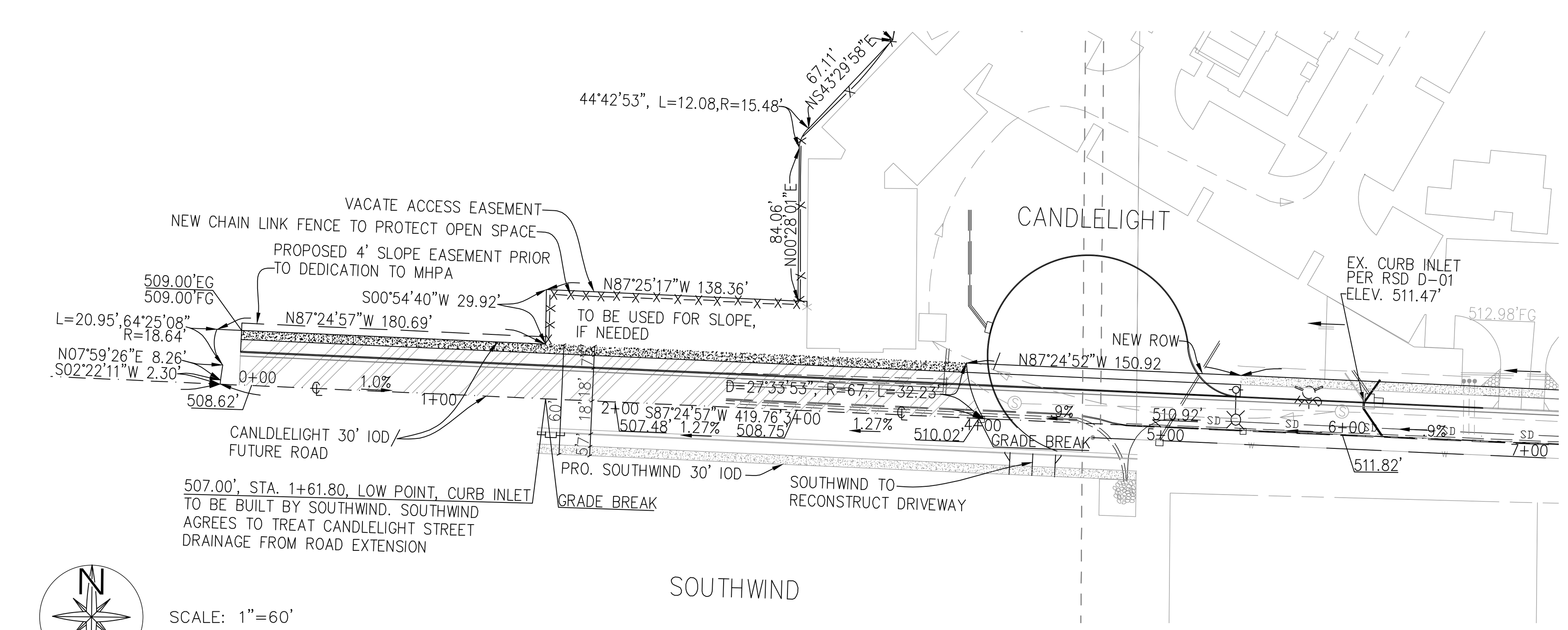
4.	4th SUBMITTAL	07/12/13	SA
5.	5TH SUBMITTAL	09/9/13	SA
6.	6TH SUBMITTAL	11/13/14	SA
7.	7TH SUBMITTAL	7/15/15	SA
8.	8TH SUBMITTAL	8/24/15	SA
9.	9TH SUBMITTAL	12/3/17	SBO
10.	10TH SUBMITTAL	01/11/18	SBO
11.			
12.			
13.			
14.			

SCHEMATIC, DETAIL CALIENTE AVE
CALIENTE AVE PROFILE, SEWER

CANDLELIGHT

CITY OF SAN DIEGO, CALIFORNIA



PROPOSED STREET IMPROVEMENT IOD OPTION
(TO BE USED IF ROAD IS EXTENDED USING IOD)

PREPARED BY:
Schwerin & Assoc.
Civil Engineering • Planning
Engineered Construction
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3.	3RD SUBMITTAL	04/23/13	SA
4.	4TH SUBMITTAL	07/12/13	SA
5.	5TH SUBMITTAL	09/9/13	SA
6.	6TH SUBMITTAL	11/13/14	SA
7.	7TH SUBMITTAL	7/15/15	SA
8.	8TH SUBMITTAL	8/24/15	SA
9.	9TH SUBMITTAL	12/3/17	SBO
10.	10TH SUBMITTAL	01/11/18	SBO
11.			
12.			
13.			
14.			

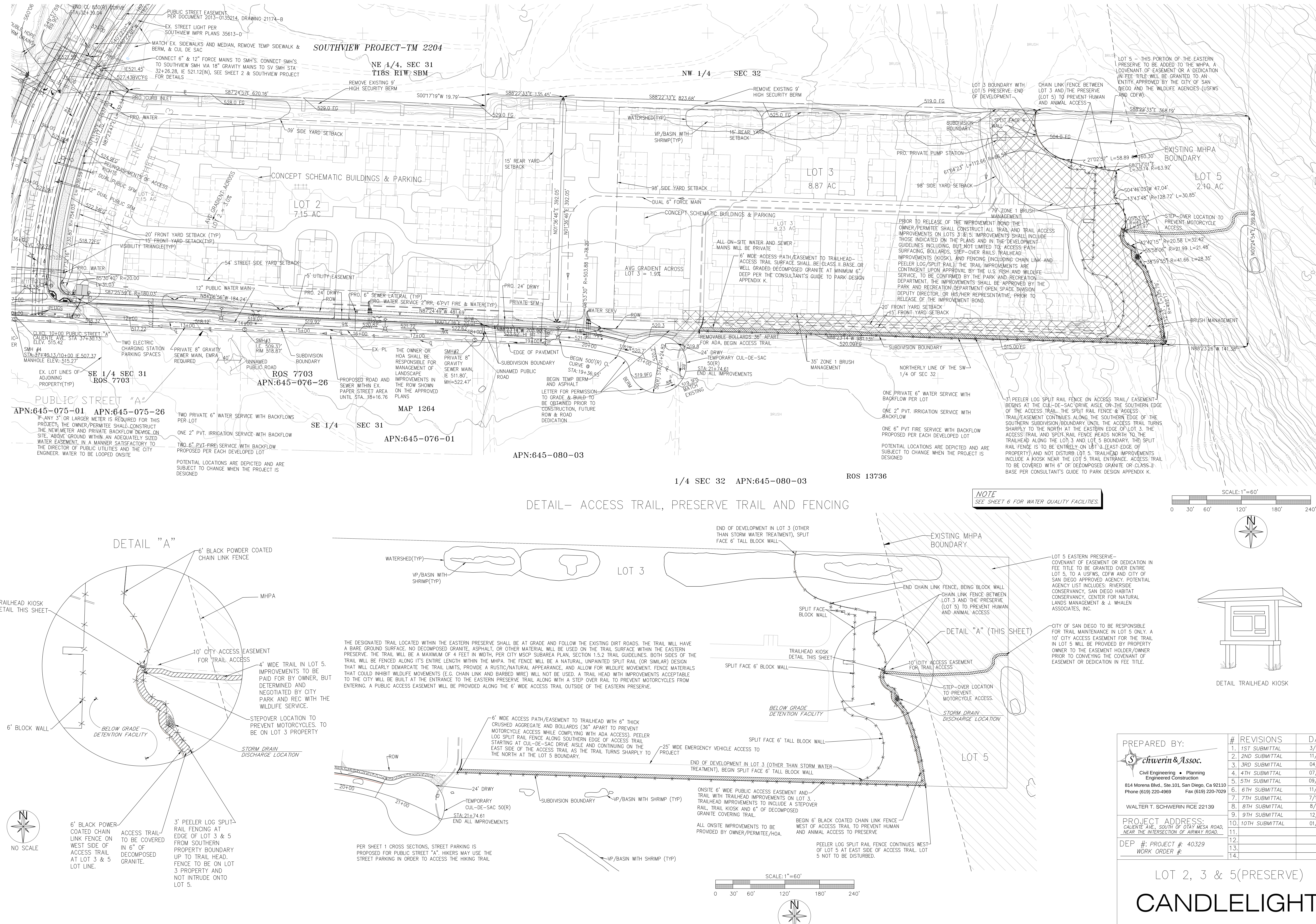
LOT 1 & 4 (WESTERN PRESERVE)

CANDLELIGHT

CITY OF SAN DIEGO, CALIFORNIA

SHEET S-3 OF S-8

CANDLELIGHT



PREPARED BY:

Schwerin & Assoc.
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Phone (619) 220-4969 Fax (619) 220-7029

WALTER T. SCHWERIN RCE 22139

PROJECT ADDRESS:
CALIENTE AVE., SOUTH OF OTAY MESA ROAD, NEAR THE INTERSECTION OF AIRWAY ROAD.

DEP #: PROJECT #: 40329
WORK ORDER #:

#	REVISIONS	DATE	BY
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2.	2ND SUBMITTAL	11/20/12	SA
3.	3RD SUBMITTAL	04/23/13	SA
4.	4TH SUBMITTAL	07/12/13	SA
5.	5TH SUBMITTAL	09/9/13	SA
6.	6TH SUBMITTAL	11/13/14	SA
7.	7TH SUBMITTAL	7/15/15	SA
8.	8TH SUBMITTAL	8/24/15	SA
9.	9TH SUBMITTAL	12/3/17	SBO
10.	10TH SUBMITTAL	01/11/18	SBO
11.			
12.			
13.			
14.			

LOT 2, 3 & 5(PRESERVE)

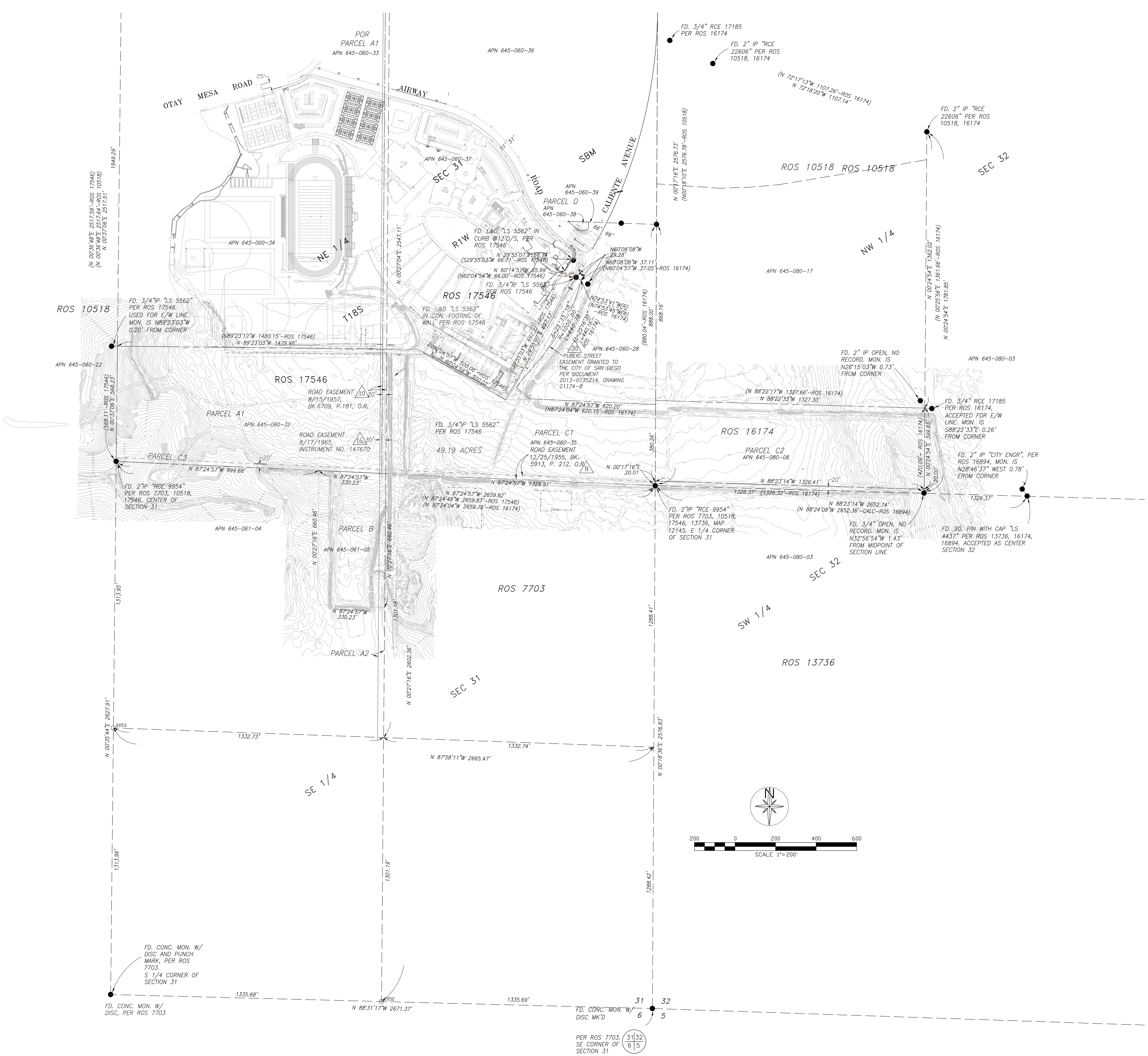
CANDLELIGHT

CITY OF SAN DIEGO, CALIFORNIA

SHEET S-4 OF S-8

PROJECT NO. 40329

CANDLELIGHT TOPOGRAPHY



ENCUMBRANCES

4. EASEMENTS FOR INGRESS AND EGRESS, PIPELINES, DRAINAGE AND/OR PUBLIC UTILITIES AND INCIDENTAL PURPOSES THERETO OVER, UNDER, ALONG AND ACROSS THE EASEMENT PARCEL(S) HEREIN DESCRIBED AS GRANTED AND/OR RESERVED IN VARIOUS DEEDS OF RECORD.
AFFECTS: PARCELS A2 AND C3

6. AN EASEMENT FOR THE PURPOSE SHOWN BELOW AND RIGHTS INCIDENTAL THERETO AS SET FORTH IN A DOCUMENT
GRANTED TO: THE COUNTY OF SAN DIEGO
PURPOSE: PUBLIC ROAD PURPOSES
RECORDED: SEPTEMBER 17, 1899 IN BOOK 280, PAGE 93 OF DEEDS
AFFECTS: AN AREA 40 FEET WIDE, 20 FEET ON EACH SIDE OF THE SECTION LINE
(NOT PLOTTED HEREON-OFFSITE EASEMENT NOT WITHIN PROJECT BOUNDARY)

8 — 8. AN EASEMENT FOR THE PURPOSE SHOWN BELOW AND RIGHTS INCIDENTAL THERETO AS RESERVED IN A DOCUMENT (NO REPRESENTATION IS MADE AS TO THE PRESENT OWNERSHIP OF SAID EASEMENT)
PURPOSE: INGRESS AND EGRESS
RECORDED: DECEMBER 21, 1955 AS DOCUMENT NO. 166106, IN BOOK 5913, PAGE 212 OF OFFICIAL RECORDS
AFFECTS: PARCEL C1.
(PORTIONS OF THIS EASEMENT RELY UPON THE LOCATION OF ITEM 6A (ABOVE) WHICH IS NOT PLOTTABLE, AND THEREFORE PORTION OF THIS EASEMENT ARE ALSO NOT PLOTTABLE.)

10 — 10. AN EASEMENT FOR THE PURPOSE SHOWN BELOW AND RIGHTS INCIDENTAL THERETO AS SET FORTH IN A DOCUMENT
GRANTED TO: NOBORU TAKASHIMA AND LILLY YURI TAKASHIMA
PURPOSE: ROAD PURPOSES
RECORDED: AUGUST 15, 1957, IN BOOK 6709, PAGE 181 OF OFFICIAL RECORDS
AFFECTS: PARCEL A1.
(PORTIONS OF THIS EASEMENT RELY UPON THE LOCATION OF ITEM 6A (ABOVE) WHICH IS NOT PLOTTABLE, AND THEREFORE PORTION OF THIS EASEMENT ARE ALSO NOT PLOTTABLE.)

13. AN AGREEMENT TO WHICH REFERENCE IS HEREBY MADE FOR FULL PARTICULARS BY AND BETWEEN: THE CITY OF SAN DIEGO AND OWNERS
REGARDING: ENCROACHMENT REMOVAL
RECORDED: APRIL 25, 1958 IN BOOK 7054, PAGE 13 OF OFFICIAL RECORDS, QUITCLAIMED BY DOC 2011-0169662
AFFECTS PARCEL C2.
(NOT PLOTTED)

16 — 16. AN EASEMENT FOR THE PURPOSE SHOWN BELOW AND RIGHTS INCIDENTAL THERETO AS SET FORTH IN A DOCUMENT
GRANTED TO: H.W. VOETH AND MARY M. VOETH, HUSBAND AND WIFE, AS JOINT TENANTS
PURPOSE: ROAD PURPOSES
RECORDED: AUGUST 17, 1965 AS FILE NO. 147670 OF OFFICIAL RECORDS
AFFECTS: THE EAST 30 FEET OF PARCEL A1
(PLOTTED HEREON)

20. THE FACT THAT THE OWNERSHIP OF SAID LAND DOES NOT INCLUDE RIGHTS OF ACCESS TO OR FROM THE STREET OR HIGHWAY ABUTTING SAID LAND, SUCH RIGHTS HAVING BEEN SEVERED FROM SAID LAND BY THE DOCUMENT
RECORDED: OCTOBER 15, 1998 AS FILE NO. 1998-0666445 OF OFFICIAL RECORDS
AFFECTS: PARCEL A1 ADJACENT TO AIRWAY ROAD AND OTAY MESA ROAD
(NOT PLOTTED)

30 — 30. PUBLIC STREET EASEMENT GRANTED TO THE CITY OF SAN DIEGO, MARCH 1, 2013, PER DOCUMENT 2013-0135214
REGARDING: ROAD EASEMENT
RECORDED: MARCH 1, 2013
AFFECTS: PARCEL C1, CALIENTE AVENUE

TOPOGRAPHY SOURCE:

TOPOGRAPHY DATED 1-08-2004 BY DAVID W. AMBLER, HUNSAKER & ASSOC.

BENCHMARK:

STANDARD BRASS DISK IN WELL MONUMENT AT CENTERLINE INTERSECTION OF OTAY MESA ROAD AND HERITAGE ROAD ELEVATION: 504.468 MSL

PREPARED BY:

Schwerin & Assoc.
Civil Engineering • Planning
Engineered Construction
814 Morena Blvd., Ste.101, San Diego, Ca 92110
Phone (619) 220-4969 Fax (619) 220-7029

WALTER T. SCHWERIN RCE 22139

PROJECT ADDRESS:
CALIENTE AVE., SOUTH OF AIRWAY ROAD, SOUTH OF SAN YSIDRO HIGH SCHOOL

DEP #: PROJECT #: 40329
WORK ORDER #:

#	REVISIONS	DATE	BY
1.	1ST SUBMITTAL	3/27/12	SA
2.	2ND SUBMITTAL	11/20/12	SA
3.	3RD SUBMITTAL	04/23/13	SA
4.	4TH SUBMITTAL	07/12/13	SA
5.	5TH SUBMITTAL	09/9/13	SA
6.	6TH SUBMITTAL	11/13/14	SA
7.	7TH SUBMITTAL	7/15/15	SA
8.	8TH SUBMITTAL	8/24/15	SA
9.	9TH SUBMITTAL	12-3-17	SBO
10.	10TH SUBMITTAL	01/11/18	SBO
11.			
12.			
13.			
14.			

SITE TOPOGRAPHY

CANDLELIGHT

CITY OF SAN DIEGO, CALIFORNIA

SHEET S-5 OF S-8

PROJECT NO. 40329

CANDLELIGHT PROPOSED BRUSH MANAGEMENT

LEGEND:

- SETBACKS
- LOTLINE
- PROPOSED ROW
- PROPOSED CURB
- BRUSH MGMT ZONE 1
- MHPA

NOTE:

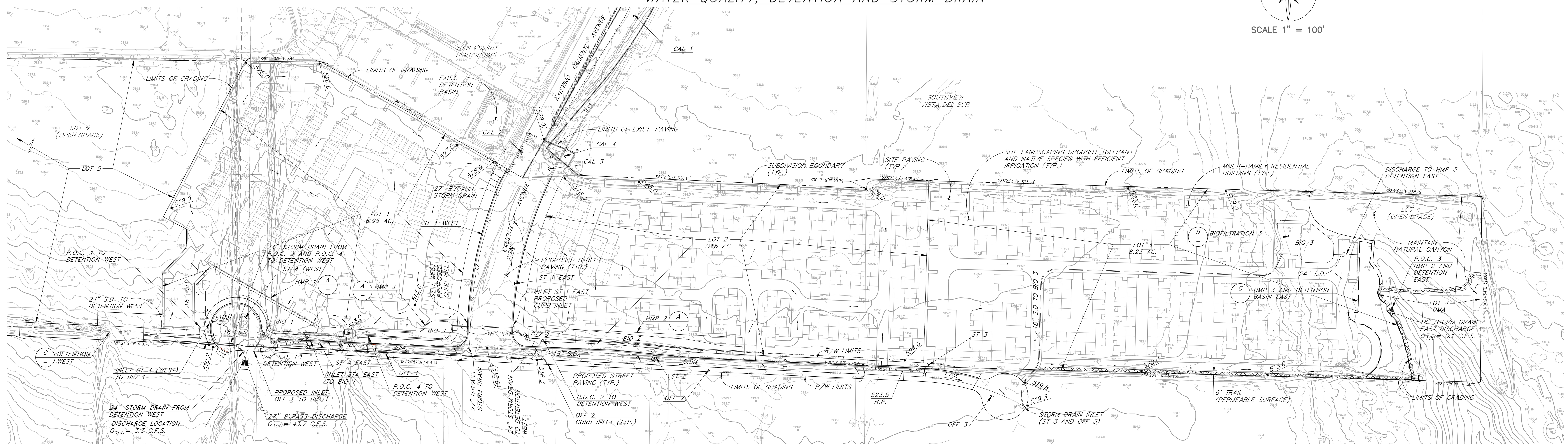
IT SHALL BE THE RESPONSIBILITY OF THE OWNER/PERMITEE TO SCHEDULE A PRE-CONSTRUCTION MEETING ON SITE WITH THE CONTRACTOR AND THE DEVELOPMENT SERVICES DEPARTMENT TO DISCUSS AND OUTLINE THE IMPLEMENTATION OF THE BRUSH MANAGEMENT PROGRAM.

BRUSH MANAGEMENT ZONES

BRUSH MANAGEMENT ZONES FOR THIS PROJECT ARE BASED ON A STANDARD 35-FT ZONE ONE WITH 65-FT ZONE TWO. FINAL CONFIGURATION OF BRUSH MANAGEMENT ZONES SHALL BE ESTABLISHED IN CONJUNCTION WITH FINAL LAYOUT OF RESIDENTIAL STRUCTURES, EXERCISING ZONE REDUCTION PROVISIONS SET FORTH UNDER 142.0412(F). WHERE COMPOSITE BRUSH MANAGEMENT ZONE(S) ARE LESS THAN STANDARD MINIMUMS, ALTERNATIVE COMPLIANCE MEASURES SHALL BE IMPLEMENTED PER 142.0412(I) THROUGH (J) TO INCLUDE:
UPGRADED OPENINGS WITH DUAL-GLAZED, DUAL-TEMPERED PANES ALONG BRUSH SIDE OF STRUCTURES PLUS A 10-FT
PERPENDICULAR RETURN ALONG ADJACENT WALL FACES, (TYP.)

SCALE 1" = 100'

WATER QUALITY, DETENTION AND STORM DRAIN



LEGEND

- SUBDIVISION BOUNDARY
- SD — BYPASS STORM DRAIN
- PROPOSED STORM DRAIN
- DIRECTION OF DRAINAGE
- 6' TRAIL (PERMEABLE SURFACE)
- 395 — EXISTING CONTOUR

NOTE:
ALL STORM DRAIN IS 18" DIAMETER UNLESS NOTED OTHERWISE.

NOTE:
SEE PROJECT SWQMP AND DRAINAGE STUDY ADDENDUM #1 FOR ADDITIONAL DETAILS.

WEST PORTION OF SITE

TO BIOFILTRATION 4

DMA	TREATMENT
OFF 2	DRAINS TO BIOFILTRATION 4
ST 2	DRAINS TO BIOFILTRATION 4
CAL 3	DRAINS TO BIOFILTRATION 4
CAL 4	DRAINS TO BIOFILTRATION 4
ST 1 EAST	DRAINS TO BIOFILTRATION 4
CAL 2	DRAINS TO BIOFILTRATION 4
ST 1 WEST	DRAINS TO BIOFILTRATION 4
TO HMP 4 TO DETENTIONING	

TO BIOFILTRATION 1

DMA	TREATMENT
ST 4 EAST	DRAINS TO BIOFILTRATION 1
OFF 1	DRAINS TO BIOFILTRATION 1
ST 4 WEST	DRAINS TO BIOFILTRATION 1
LOT 1	DRAINS TO BIOFILTRATION 1
TO HMP 1 TO DETENTION WEST	

TO BIOFILTRATION 2

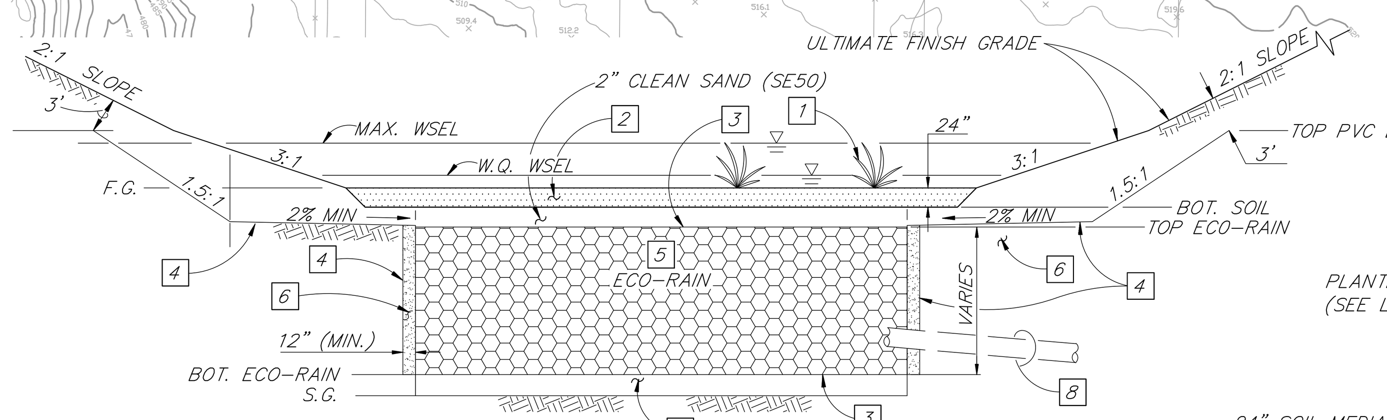
DMA	TREATMENT
LOT 2	DRAINS TO BIOFILTRATION 2 THEN TO HMP 2 TO DETENTION WEST

EAST PORTION OF SITE

DMA	TREATMENT/TYPE
ST 3	DRAINS TO BIOFILTRATION 3
OFF 3	DRAINS TO BIOFILTRATION 3
LOT 3	DRAINS TO BIOFILTRATION 3
TO BIOFILTRATION 3	TO HMP 3/DETENTION EAST

REMAINDER AREAS

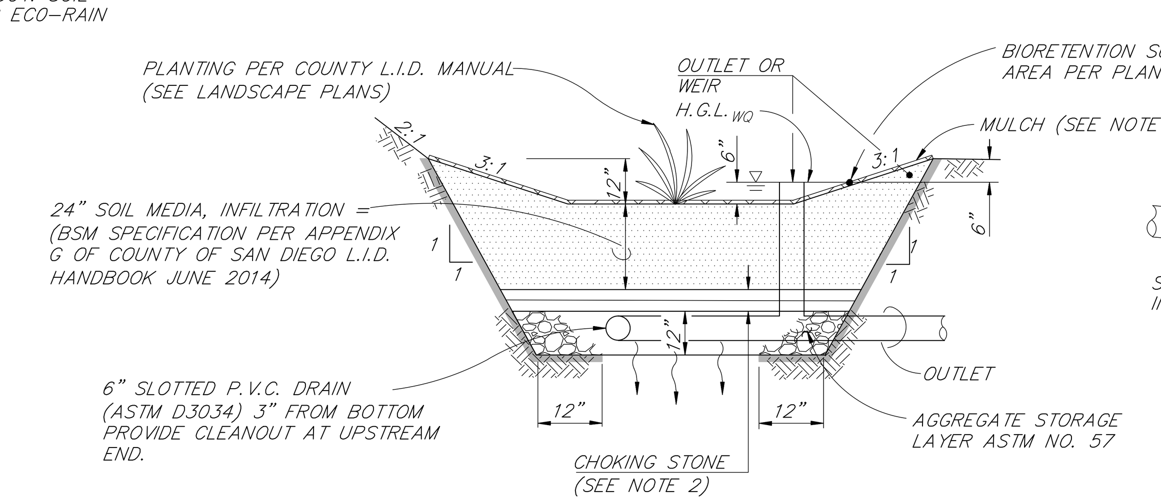
DMA	TREATMENT/TYPE
DETENTION WEST/ACCESS – SELF RETAINING	
TRAIL (LOT 3)	SELF RETAINING
LOT 4	OPEN SPACE – SELF MITIGATING
LOT 5	OPEN SPACE – SELF MITIGATING
CAL 1 EXIST. STREET BYPASS STORM DRAIN (NOT A PART)	



NOTES

1. PLANTING PALETTE PER COUNTY L.I.D. MANUAL (SEE LANDSCAPE CONSTRUCTION DRAWINGS.
2. 24" SOIL MEDIA (BSM SPECIFICATION PER APPENDIX G OF COUNTY OF SAN DIEGO L.I.D. HANDBOOK JUNE 2014)
3. "ECORAIN" STORAGE SYSTEM SHALL BE FULLY WRAPPED WITH PERMEABLE GEOFABRIC MIRAFI 140N, PER MANUFACTURER'S RECOMMENDATIONS.
4. 30 MIL. P.V.C. LINER SHALL BE FULLY WATER-TIGHT. ALL JOINTS SHALL OVERLAP 12" MIN. AND BE SEALED. LINER SHALL BE SEALED WITH MASTIC TO ALL STRUCTURES. ALL PENETRATIONS SHALL BE SEALED. INSTALL ON SIDES ONLY. BOTTOM SHALL BE UNLINED.
5. "ECO-RAIN" SPACE STORAGE SYSTEM. INSTALL PER MANUFACTURE'S SPECIFICATIONS AND GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
6. BACKFILL WITH CLEAN SAND OR GRAVEL MATERIALS OR A MIX OF BOTH, FREE FROM LUMPS AND DEBRIS OR SHARP MATERIALS. COMPACT FILL IN LIFTS LESS THAN 12 INCHES TO 85% COMPACTION. SEE MANUFACTURER'S RECOMMENDATIONS.
7. BEDDING PER MANUFACTURER'S RECOMMENDATIONS
8. TO OUTLET CONTROL STRUCTURE.

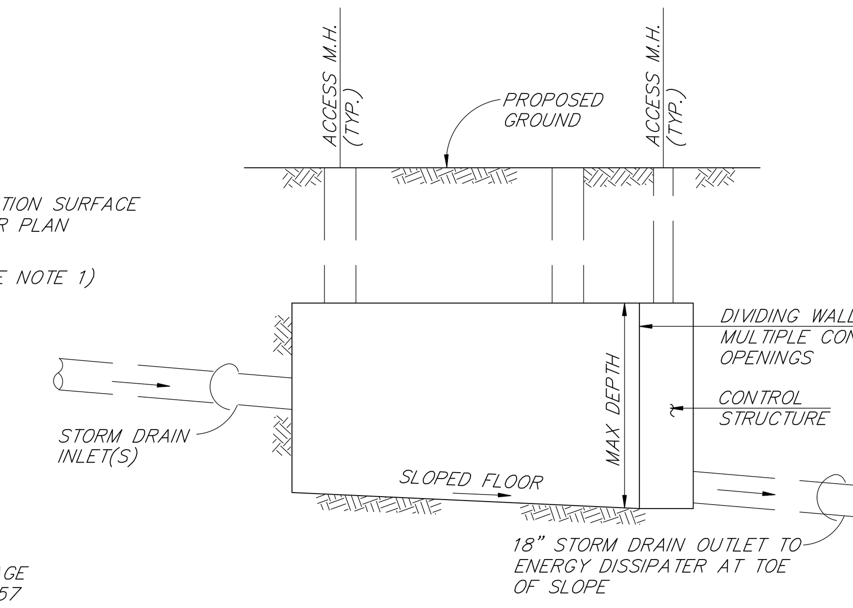
(A) COMPOSITE BASIN 1, 2 & 4
NOT TO SCALE



NOTES

1. INSTALL 3" WELL AGED SHREDDED HARDWOOD MULCH THAT HAS BEEN STOCKED PILED OR STORED FOR AT LEAST 12 MONTHS. MULCH MUST BE NON-FLOATING.
2. CHOKING STONE TO BE 3" CLEAN AND WASHED SAND (ASTM NO. 33) OVER 3" LAYER OF ASTM NO. 8 STONE.

(B) DETAIL ~ BIOFILTRATION BASIN 3
NOT TO SCALE



DETENTION SCHEDULE

STRUCTURE	DETENTION VOLUME (C.F.)	MAX DEPTH (FT.)	HMP VOLUME (C.F.)	HMP DEPTH
EAST	78,000	5.6	76,354	5.5
WEST	82,000	6.0	NONE	N/A

(C) DETAIL ~ UNDERGROUND HMP/DETENTION STRUCTURE
NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER ALLEN L. BUTCHER No. 47107 CIVIL STATE OF CALIFORNIA

SB&O INC.
PLANNING ENGINEERING SURVEYING
3990 Ruffin Road, Suite 120
San Diego, Ca. 92123
858-560-1141
858-560-8157 Fax

ALLEN BUTCHER P.E. 47107

PREPARED BY:
Schwerin & Assoc.
Civil Engineering • Planning
Engineered Construction
814 Morena Blvd., Ste.101, San Diego, Ca 92110
Phone (619) 220-4969 Fax (619) 220-7029

WALTER T. SCHWERIN RCE 22139

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SOUTH OF SAN YSIDRO HIGH SCHOOL

DEP #: PROJECT #: 40329
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2.	2ND SUBMITTAL	11/20/12	SA
3.	3RD SUBMITTAL	04/23/13	SA
4.	4TH SUBMITTAL	07/12/13	SA
5.	5TH SUBMITTAL	09/9/13	SA
6.	6TH SUBMITTAL	11/13/14	SA
7.	7TH SUBMITTAL	7/15/15	SA
8.	8TH SUBMITTAL	8/24/15	SA
9.	9TH SUBMITTAL	12/3/17	SBO
10.	10TH SUBMITTAL	01/11/18	SBO
11.			
12.			
13.			
14.			

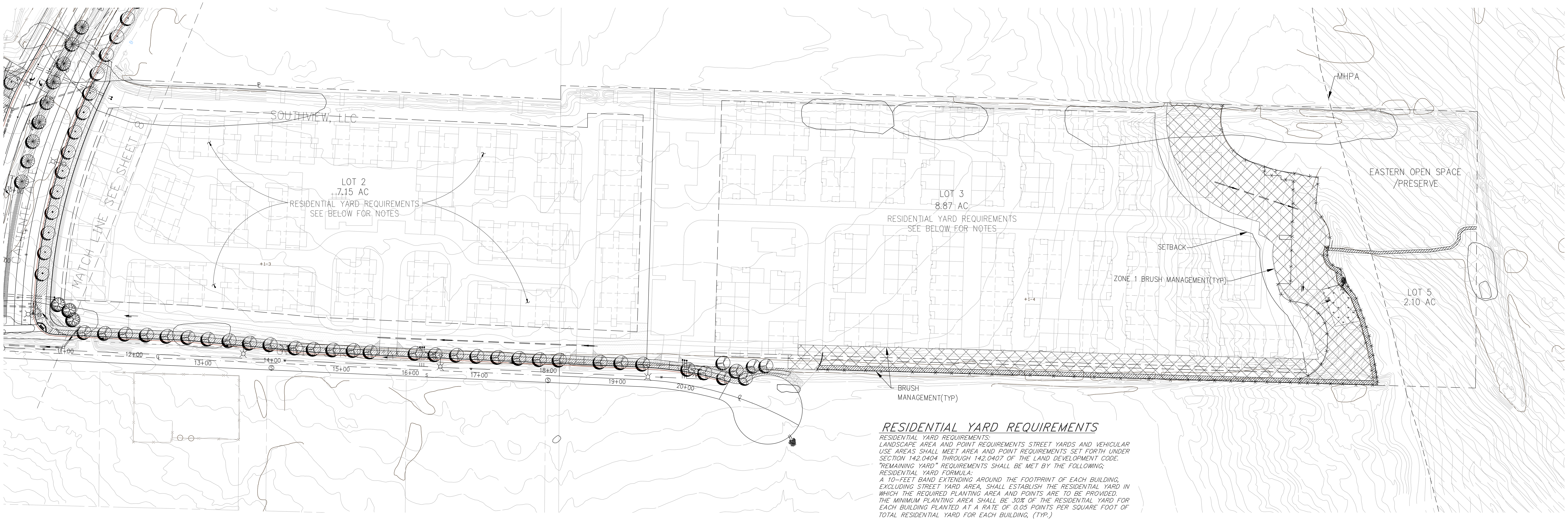
PROPOSED BRUSH MANAGEMENT AND STORM WATER DETAILS

CANDLELIGHT

CITY OF SAN DIEGO, CALIFORNIA

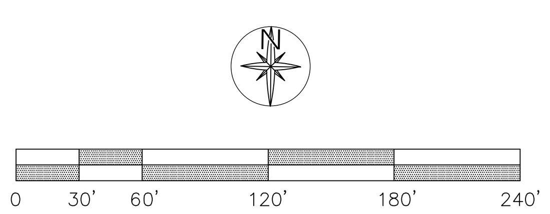
PROJECT NO. 40329

CANDLELIGHT



RESIDENTIAL YARD REQUIREMENTS

RESIDENTIAL YARD REQUIREMENTS:
LANDSCAPE AREA AND POINT REQUIREMENTS STREET YARDS AND VEHICULAR USE AREAS SHALL MEET AREA AND POINT REQUIREMENTS SET FORTH UNDER SECTION 142.0404 THROUGH 142.0407 OF THE LAND DEVELOPMENT CODE.
"REMAINING YARD" REQUIREMENTS SHALL BE MET BY THE FOLLOWING;
RESIDENTIAL YARD FORMULA:
A 10-FEET BAND EXTENDING AROUND THE FOOTPRINT OF EACH BUILDING, EXCLUDING STREET YARD AREA, SHALL ESTABLISH THE RESIDENTIAL YARD IN WHICH THE REQUIRED PLANTING AREA AND POINTS ARE TO BE PROVIDED.
THE MINIMUM PLANTING AREA SHALL BE 30% OF THE RESIDENTIAL YARD FOR EACH BUILDING PLANTED AT A RATE OF 0.05 POINTS PER SQUARE FOOT OF TOTAL RESIDENTIAL YARD FOR EACH BUILDING, (TYP.)



NO INVASIVE SPECIES
ADJACENT TO THE MHPA

PLANT MATERIAL LEGEND

Sym
Qty.

Street Trees for Caliente Blvd.- 100% 24" box - 30' O.C.
Broadheaded/ Deciduous + Evergreen -(20'-30' Spread)

(15)

MAGNOLIA GRADIFLORA	SOUTHERN MAGNOLIA
CERATONIA SILIQUA	CAROB TREE
PLATANUS RACEMOSA	CALIFORNIA SYCAMORE
LIQUIDAMBAR STYRACIFLUA	AMERICAN SWEETGUM

Median Trees for Caliente Blvd. (9)
100% 24" box - 30' O.C.
Broadheaded / Deciduous + Evergreen -(20'-30' Spread)

(9)

ALNUS RHOMBIFOLIA	WHITE ALDER
ULMUS PARVIFOLIA	CHINESE ELM
CERATONIA SILIQUA	CAROB TREE

Shrub planting for Caliente Blvd. - 50% 5 gal. 50% 1 gal.

ABELIA GRANDIFLORA	GLOSSY ABELIA
CEANOTHUS SPP.	CEANOTHUS SPECIES
CISTUS PURPUREUS	ORCHID ROCKROSE
ELEAGNUS PUNGENS	SILVERBERRY
PITTOSPORUM SPP.	MOCK ORANGE SPECIES
PHORMIUM TENAX	NEW ZEALAND FLAX
PHOTINIA FRASERI	PHOTINIA
ROSEMARINUS SPP.	ROSEMARY SPECIES
XYLOSMA CONGESTUM	SHINY XYLOSMA
MYOPORUM PARVIFOLIUM	PROSTRATE MYOPORUM

Street Trees for Public Street A - 100% 24" box - 30' O.C.
Broadheaded / Deciduous + Evergreen -(20'-30' Spread)

(39)

ALBIZIA JULIBRISSIN	SILK TREE
BRACHYCHITON ACERIFOLIUS	FLAME TREE
JACARANDA ACUTIFOLIA	JACARANDA
KOELREUTERIA PANICULATA	GOLDEN RAINTREE
TIPUANA TIPU	TIPU TREE
TRISTANIA CONFERTA	BRISBANE BOX

Shrub planting for Public Street A- 50% 5 gal. 50% 1 gal.

AGAPANTHUS AFRICANUS	LILY-OF-THE-NILE
COPROSMA SPP.	MIRROR PLANT SPECIES
DIETES VEGETA	FORTNIGHT LILY
ESCALLONIA FRADESI	ESCALLONIA
LANTANA MONTEVIDENSIS	TRAILING LANTANA
PITTOSPORUM SPP.	MOCK ORANGE SPECIES
NANDINA DOMESTICA	HEAVENLY BAMBOO
PHORMIUM TENAX	NEW ZEALAND FLAX
RHAPIOLEPIS SPP.	INDIA HAWTHORNE SPECIES
ROSEMARINUS SPP.	ROSEMARY SPECIES
VIBURNUM TINUS	LAURUSTRINUS
MYOPORUM PARVIFOLIUM	PROSTRATE MYOPORUM

Project Entry Trees - 70% 24" box - 30% 36" box
Broadheaded / Evergreen -(20'-30' Spread)

(3)

CERATONIA SILIQUA	CAROB TREE
RHUS LANCEA	AFRICAN SUMAC
LAGERSTROEMIA INDICA	CRAPE MYRTLE

Gregg Stockwell & Associates, Inc.
LANDSCAPE ARCHITECTURE
P.O. Box 1056 Poway, CA 92074
Tel. 858-748-3350 email: gregg@gstockwell.com
Tel. 858-748-3301
Fax 858-748-2884 CA 2048 HI LA-11706

REGISTERED LANDSCAPE ARCHITECT
GREGG MORGAN STOCKWELL
NO. 2048
Signature
DECEMBER 31, 2018
Date
STATE OF CALIFORNIA

PREPARED BY :

NAME :
GREGG STOCKWELL & ASSOCIATES INC.

ADDRESS : P.O. BOX 1056
POWAY, CA 92074

PHONE # : 858-748-3350

PROJECT ADDRESS :
CALIENTE AVE., SOUTH OF OTAY MESA ROAD, NEAR THE INTERSECTION OF AIRWAY ROAD.

PROJECT NAME :
CANDLELIGHT VILLAS EAST

SHEET TITLE :
LANDSCAPE CONCEPT PLAN

REVISION 14 :	
REVISION 13 :	
REVISION 12 :	
REVISION 11 :	
REVISION 10 :	01-11-18
REVISION 9 :	11-3-17
REVISION 8 :	2-20-16
REVISION 7 :	8-24-15
REVISION 6 :	7-15-15
REVISION 5 :	11-13-14
REVISION 4 :	09-9-13
REVISION 3 :	07-12-13
REVISION 2 :	04-24-13
REVISION 1 :	11-20-12

ORIGINAL DATE : 3-27-12

SHEET 7 OF 8

CANDLELIGHT

RESIDENTIAL YARD REQUIREMENTS

RESIDENTIAL YARD REQUIREMENTS:
LANDSCAPE AREA AND POINT REQUIREMENTS STREET YARDS AND VEHICULAR USE AREAS SHALL MEET AREA AND POINT REQUIREMENTS SET FORTH UNDER SECTION 142.0404 THROUGH 142.0407 OF THE LAND DEVELOPMENT CODE.
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LANDSCAPE NOTES:

NO TREES WILL BE INSTALLED WITHIN 10 FEET OF WATER OR SEWER FACILITIES.

NO INVASIVE PLANTS WILL BE USED ADJACENT TO THE OPEN SPACE PRESERVE.

NO RECYCLED WATER IS AVAILABLE, SYSTEM WILL BE SET UP TO CONVERT TO RECYCLED WATER ONCE AVAILABLE.

ROW AND MEDIAN IMPROVEMENTS, IRRIGATION AND LANDSCAPING WILL BE MAINTAINED BY THE OWNER OR HOA.

SEE SHEET 7 FOR LEGEND

Gregg Stockwell & Associates, Inc.

P.O. Box 1056 *Poway, CA 92074*
Tel. 858-748-3350 *email: gregg@gstockwell.com*
Tel. 858-748-3301
Fax 858-748-2884 *CA 2048* *HI LA-11706*

REGISTERED LANDSCAPE ARCHITECT
GREGG MORGAN STOCKWELL
NO. 2048
Signature
DECEMBER 31, 2018
Date
STATE OF CALIFORNIA

PREPARED BY :	REVISION 14 :
NAME : GREGG STOCKWELL & ASSOCIATES, INC.	REVISION 13 :
ADDRESS : P.O. BOX 1056 POWAY, CA 92074	REVISION 12 :
PHONE # : 858-748-3350	REVISION 11 :
PROJECT ADDRESS : CALIENTE AVE., SOUTH OF OTAY MESA ROAD, NEAR THE INTERSECTION OF AIRWAY ROAD.	REVISION 10 : 01-11-18
PROJECT NAME : CANDLELIGHT	REVISION 9 : 12-3-17
SHEET TITLE : LANDSCAPE CONCEPT PLAN	REVISION 8 : 2-20-16
	REVISION 7 : 8-24-15
	REVISION 6 : 7-15-15
	REVISION 5 : 11-13-14
	REVISION 4 : 09-9-13
	REVISION 3 : 07-12-13
	REVISION 2 : 04-24-13
	REVISION 1 : 11-20-12
	ORIGINAL DATE : 3-27-12
	SHEET 8 OF 8

Appendix O

Native American Project Correspondence
Sept. 2014

VIEJAS
TRIBAL GOVERNMENT

P.O. Box 908
Alpine, CA 91903
#1 Viejas Grade Road
Alpine, CA 91901

Phone: 6194453810
Fax: 6194455337
viejas.com

September 10, 2014

Myra Herrmann
City of San Diego
1222 1st Ave.
San Diego, CA 91901

RE: Candlelight Project Site in Otay Mesa

Dear Ms. Herrmann,

After reviewing the Cultural Resource Report and site visit, we determine that the project site is in an area that contains significant cultural resources of the Kumeyaay people; therefore, we request that at least one Viejas cultural monitor to be present on site for all ground disturbing activities. Also, if any cultural resources are collected, they should be curated at Barona Band of Mission Indians

Please contact me (Julie Hagen) for additional information regarding Viejas' sanctioned cultural monitors at 619-659-2339 or email jhagen@viejas-nsn.gov. Thank you for your collaboration and support in preserving Kumeyaay cultural resources. I look forward to hearing from you.

Sincerely,
VIEJAS BAND OF KUMEYAAY INDIANS

Appendix P

On-Site Vernal Pool Restoration Plan
Alden Environmental, July 2013

ALDEN
ENVIRONMENTAL, INC
3245 University Ave, #1188 | San Diego, CA 92104 | Phone/Fax: 619.284.3815

Candlelight Project (LDR 40329)
Vernal Pool Restoration Plan Changes
July 2, 2013

The attached On-Site Vernal Pool Restoration Plan, dated August 5, 2008, was written for the Candlelight Villas East and West project (LDR 40329). The project applicant at the time was Western Pacific Housing-D.R. Horton. The project name and applicant have since changed. In addition, the project currently being processed through the City is smaller than that covered by the restoration plan and the Biological Opinion (BO) issued for the project by the U.S. Fish & Wildlife Service. The previous project included impacts associated with the "panhandle" parcel (APN 645-061-0500) that extends to the south. While the current project is smaller than the previous submittal, the vernal pool plan and the BO still assess impacts and provide required mitigation for the larger area, including the panhandle. A future application may be submitted for this parcel, the impacts of which also would be mitigated as described in the vernal pool plan.

While there have been changes in the project design and applicant, the essential components of the on-site vernal pool restoration plan remain unchanged. The following text provides updates to the text in the vernal pool plan as necessary to reflect the current project being processed through the City.

Project Applicant/Responsible Party (VP Plan Section IV.C)

The current project title and applicant/responsible party are provided below:

Project Title: Candlelight Project

Report Title: On-Site Vernal Pool Restoration Plan

Applicant: Candlelight, LLC

City Number: 40329

Project Summary (VP Plan Section II.B)

The current Candlelight project is located on a 44.9-acre parcel in the Otay Mesa area of San Diego. The project would subdivide the property into 3 multi-family residential lots and 2 open space/habitat preserve lots (Figures 4a and 4b in the project Biological Technical Report). The current zoning is RM2-5 with an allowable density of 29 dwelling units per acre. This would allow 647 dwellings on the three lots. However, due to the physical constraints of the property, the project proposes a maximum of 475 multifamily units.

Road access to the site will be provided by extending Caliente Avenue to the south as a 5-lane major and creating Public Street "A" running east and west below Caliente Avenue as a 2- lane collector. The project also proposes creating a temporary cul-de-sac to the west of Public Street

3245 University Ave, #1188 | San Diego, CA 92104 | Phone/Fax: 619.284.3815

"A" and another off-site cul-de-sac at the east end of Public Street "A." Internal circulation will be provided by private driveways throughout the project. Additionally, the City will install a pedestrian trail along an existing dirt road within the Eastern Preserve.

Burrowing Owls (VP Plan Sections I, II.D, III.B, IV.B, and V)

Section II.D of the vernal pool plan identified impacts to burrowing owl habitat resulting from project implementation. Additional surveys have been conducted since the vernal pool plan was written and, based on the results of the new fieldwork and the current CDFW Staff Report on Burrowing Owl Mitigation (March 7, 2012), burrowing owls would not be impacted by the project. This is discussed in more detail in Sections 2.2.4, 4.3.1, and 5.1.6 of the Candlelight Biological Technical Report. References to burrowing owl impacts and associated mitigation measures in the vernal pool plan are no longer valid.

Section III.B of the vernal pool plan provides specifics on burrowing owl mitigation and pre-construction surveys to be conducted in the vernal pool habitat restoration areas. The project will not impact burrowing owls and no mitigation is required for impacts. The restoration effort will; however, continue to incorporate the artificial owl burrow installation as presented in the vernal pool plan. Pre-construction burrowing owl surveys of the vernal pool restoration areas also will be conducted according to the current CDFW Staff Report on Burrowing Owl Mitigation. The guidelines in this report supersede those of the 1995 CDFG Staff Report on Burrowing Owl Mitigation cited in the vernal pool plan.

Trail

A pedestrian trail is now proposed to occur within the Eastern Preserve area that was not included in the previous project submittals. The trail will be installed by the City and is not a component of the vernal pool restoration effort. It is being identified here for informational purposes.

The designated trail located within the MHPA in the Eastern Preserve (as shown on Figure 4b of the Candlelight Biological Technical Report) shall be at grade and follow existing dirt roads and will avoid existing vernal pools and their associated watersheds. The trail will have a bare ground surface. No decomposed granite, asphalt, or other material will be used on the trail. The trail will be a maximum of 4 feet in width, per the City MSCP Subarea Plan trail guidelines (Section 1.5.2). Both sides of the trail will be fenced along its entire length within the MHPA. The fence will be a natural wood, unpainted split rail (or similar) design that will clearly demarcate the trail limits, provide a rustic/natural appearance, and allow for wildlife movement. Fence materials that could inhibit wildlife movement (e.g. chain link and barbed wire) will not be used.

ALDEN ENVIRONMENTAL, INC
3245 University Ave, #1188 | San Diego, CA 92104 | Phone/Fax: 619.284.3815

Long-Term Management (VP Plan Section IX.C)

Section IX.C of the vernal pool plan notes that long-term (post 5-year maintenance and monitoring period) management will be the responsibility of a yet to be identified management entity. The management entity must be approved by the City and agencies. In addition, a Property Analysis Record (PAR) also will be required to identify the funding requirements for the long-term management effort. Specifics of the long-term management are identified in the Habitat Management Plan (HMP) for the project.

The remainder of the vernal pool plan accurately reflects the vernal pool habitat restoration to be conducted.

Greg Mason
Principal/Senior Biologist

CANDLELIGHT VILLAS EAST

ON-SITE VERNAL POOL RESTORATION PLAN
LDR No. 40329

~~March 16, 2006~~
May 31, 2006

Prepared for:

WESTERN PACIFIC HOUSING-D.R. HORTON
5790 Fleet Street, Suite 210
Carlsbad, California 92008

Prepared by:

HELIX ENVIRONMENTAL PLANNING, INC.
7578 El Cajon Boulevard, Suite 200
La Mesa, California 91941

Greg Mason
Project Manager and
Biology Division Manager

Candlelight Villas East
On-site Vernal Pool Restoration Plan

TABLE OF CONTENTS

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LIST OF FIGURES

LIST OF TABLES

I. INTRODUCTION

This report provides the on-site vernal pool restoration plan for direct impacts to vernal pools, road pools with fairy shrimp, disturbed wetlands, and non-wetland Waters of the U.S., and provides a burrowing owl (*Athene cunicularia*) translocation plan for impacts to burrowing owls resulting from implementation of the Candlelight East Villas project (proposed project). The mitigation measures identified herein are based on those contained in the project's Biological Technical Report (HELIX Environmental Planning, Inc. [HELIX] 2006a) and Environmental Impact Report (EIR; T&B 2006). The proposed mitigation is intended to meet the requirements of project's U.S. Army Corps of Engineers (Corps) Section 404 Individual Permit, California Department of Fish and Game (CDFG) Section 1602 Streambed Alteration Agreement, Regional Water Quality Control Board (RWQCB) 401 Water Quality Certification, and City of San Diego's (City) Environmentally Sensitive Lands (ESL) regulations. The restoration of vernal pool habitat and watershed areas proposed in this plan would take place on site. The burrowing owl mitigation is based on CDFG (1995) recommendations.

II. PROJECT DESCRIPTION

A. PROJECT LOCATION

The Candlelight Villas East project site is located in the City's Otay Mesa community, 1.1 miles east of Interstate 805 and 1.4 miles north of the U.S./Mexico border (Figure 1). The property occupies a portion of Section 31 within Township 18 South, Range 1 West of the U.S. Geological Survey 7.5-minute Imperial Beach quadrangle map (Figure 2). Approximately 2.5 acres of the project site occurs within the City's Multi-Habitat Planning Area (MHPA).

The San Ysidro High School bounds the project site to the northwest of Caliente Avenue along with undeveloped land, which also lies to the south, east, and west. The site is accessed on the northern border via the current terminus of Caliente Avenue.

B. PROJECT SUMMARY

The Candlelight Villas East project is a proposed 432-unit multi-family residential community on Lots 1 through 3. Primary access would be provided by the extension of Caliente Avenue from Otay Mesa Road. Private drives would provide circulation to the private residences of the project. The project's staging area would be located on Lot 4. In addition, proposed roadway improvements and brush management are proposed off site, to the north and south of the project site. Open space would be preserved at the easternmost portion of the site within and adjacent to the City's MHPA and in the northwestern portion of the site.

C. JURISDICTIONAL IMPACTS

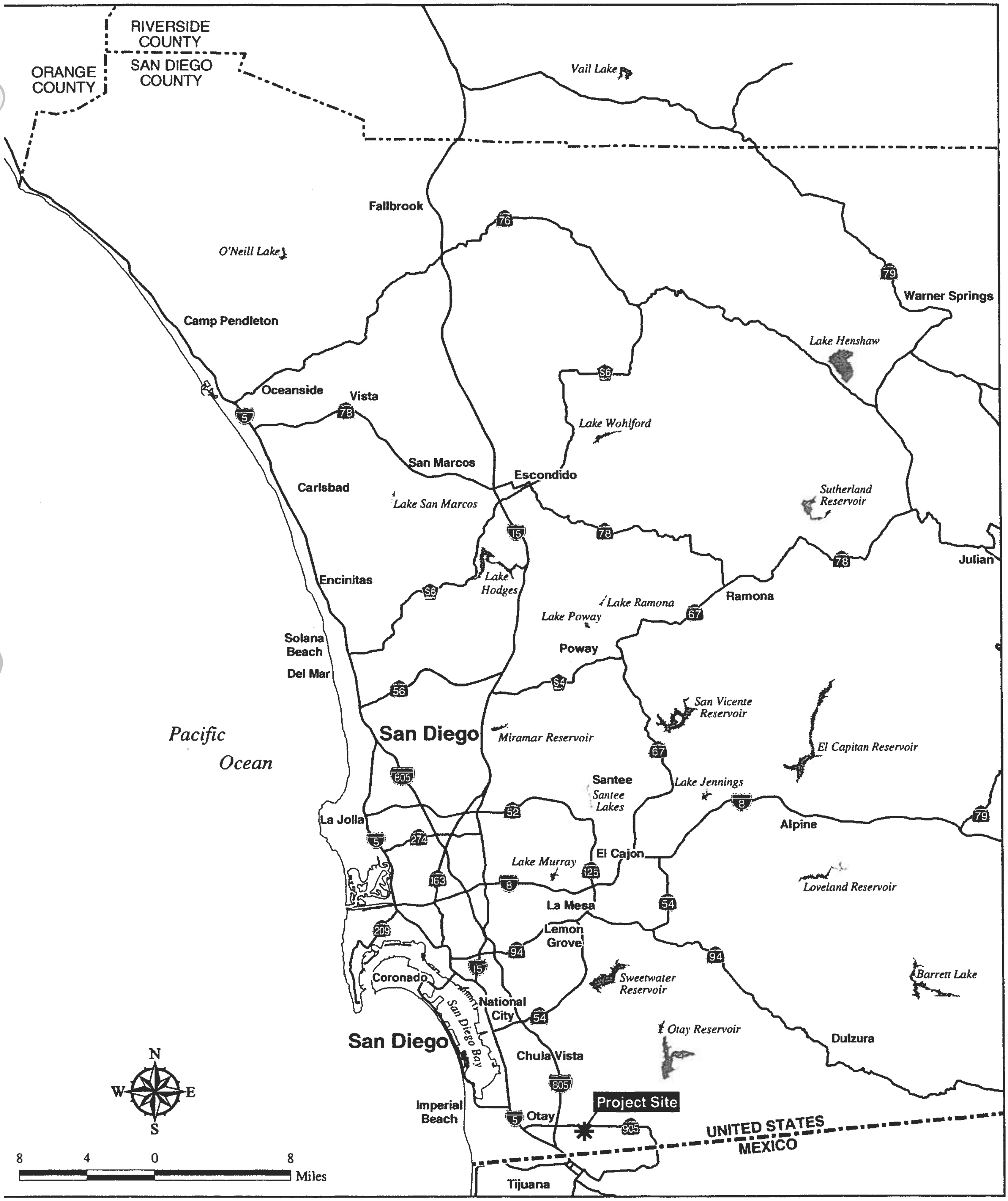
A jurisdictional delineation was conducted in June of 2004 by Greg Mason of HELIX Environmental Planning, Inc. (HELIX) that identified jurisdictional areas on the proposed project site. The Corps and the U.S. Fish and Wildlife Service (USFWS) reviewed the initial delineation during a site visit. W. Larry Sward conducted an additional delineation visit in December 2004. Upon review of the delineation, the Corps determined that all of the vernal pools and road pools supporting listed fairy shrimp species were jurisdictional. The vernal pools and road pools with shrimp are not CDFG jurisdictional. The project would impact vernal pools, road pools with fairy shrimp, and non-wetland Waters of the U.S./Streambed.

1. Vernal Pools

Vernal pools are a highly specialized habitat that support a unique flora and fauna. Vernal pools are associated with two important physical conditions: a subsurface hardpan or claypan that inhibits the downward percolation of water and topography characterized by a series of low hummocks (mima mounds) and depressions (vernal pools). These two physical conditions allow water to collect in the depressions during the rainy season. Water that has collected in these vernal pools gradually evaporates with the passing of the rainy season. As water evaporates, a gradient of low soil water availability to high soil water availability is created from the periphery of the pool margins to the center of the pool. The chemical composition of the remaining pool water becomes more concentrated as the pool water evaporates, creating a gradient of low ion concentration at the pool periphery to high ion concentration at the pool center. A temporal succession of plant species will occur at the receding pool margins, depending upon the physical and chemical micro environmental characteristics of the pool. Vernal pools in a wet year will have a high proportion of native species that are endemic to this habitat. During these years, the exotic, ruderal species characteristic of the non-native grasslands that occur on the surrounding mima mounds may not invade these pools, as they are unable to tolerate the physiological conditions. In years of scarce rainfall insufficient to saturate the soil and create a surface pool, the native endemic flora may not germinate, and the pool may be invaded by exotic species.

The vernal pools on- and off-site are highly disturbed and the result of human activity. Earthen berms were constructed along the property boundaries to restrict access and illegal dumping. Based on an historic air photo analysis, it appears that the berms were constructed sometime between 1995 and 1997 (HELIX 2005). Construction of the berms resulted in lower areas or depressions near their bases. Clay soils present in those depressions are somewhat impervious, and standing water is present following winter and spring rains for periods of weeks. The vernal pools on- and off-site occur within the scraped depressions at the base of the constructed berms.

The project would impact a total of 11 vernal pools (VP Nos. 4 through 11 and 13 through 15) with a combined surface area of 0.07 acre (3,220 square feet; (Table 1; Figure 3). Two of the impacted vernal pools (VP Nos. ~~9~~8 and 14) support the federally listed as endangered San Diego fairy shrimp (*Branchinecta sandiegonensis*). All of the vernal pools on site are low in quality, exhibit an overall low native plant species diversity and cover, and are dominated by non-native grasses and forbs. Vernal pool indicator plant species cover is less than one percent for all the vernal pools. Indicator plant species observed within the vernal pools include quillwort (*Lilaea scilloides*), water clover (*Marsilea vestita*), dwarf woolly-heads (*Psilocarphus brevissimus*), and adobe popcorn flower (*Plagiobothrys acanthocarpus*). Because of their location adjacent to the constructed berms, the pools are subject to impacts from off-highway vehicle (OHV) and illegal dumping. In addition, many of the pools are slowly filling in with sediment as the constructed berms erode.



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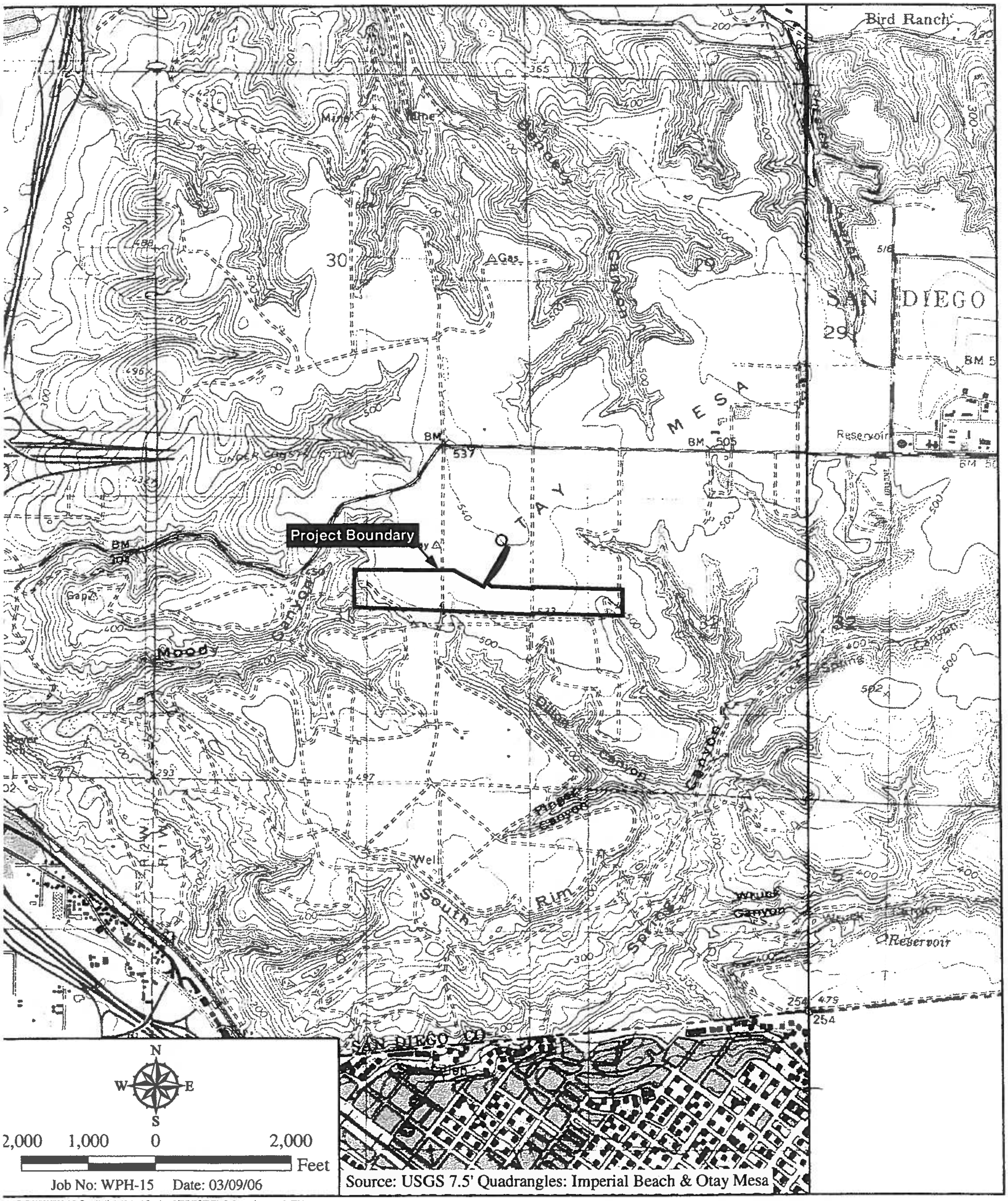
Regional Location Map

ON-SITE VERNAL POOL RESTORATION PLAN FOR CANDLELIGHT VILLAS EAST

ELIX

Figure 1



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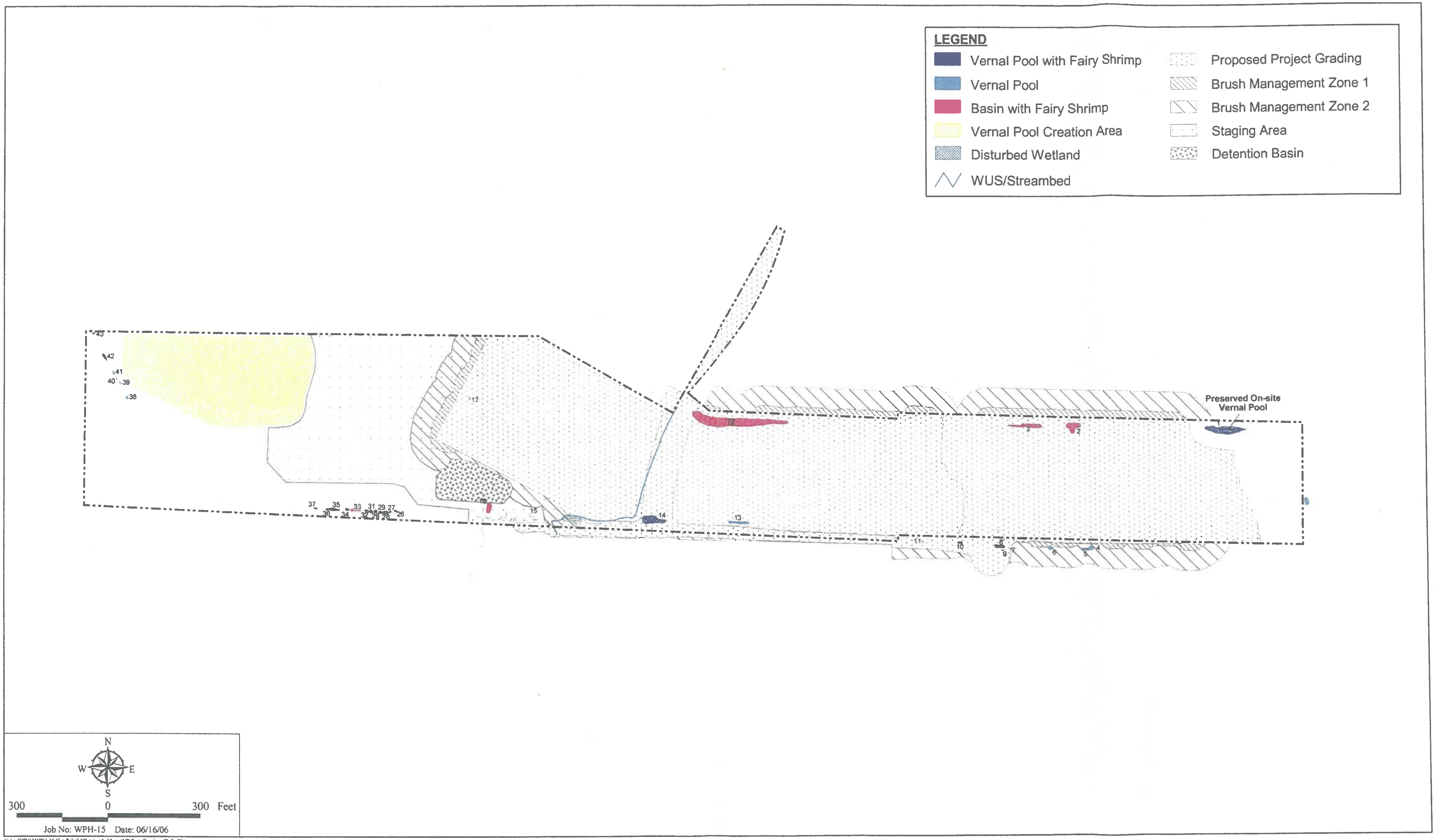
Project Location Map

ON-SITE VERNAL POOL RESTORATION PLAN FOR CANDLELIGHT VILLAS EAST

HELIX

Figure 2



Project Impacts

ON-SITE VERNAL POOL RESTORATION PLAN FOR CANDLELIGHT VILLAS EAST

HELIX

Figure 3

Table 1 JURISDICTIONAL IMPACTS		
Habitat	**Corps**	**CDFG**
Vernal Pool	0.07 ac (3,220 sq. ft.)	--
Road Pool	0.23 ac (9,973 sq. ft.)	--
Disturbed Wetland	--	0.02 ac (1,080 sq. ft.)
Ephemeral Drainage	0.04 ac (1,605 sq. ft.)	0.04 ac (1,605 sq. ft.)
TOTAL	**0.34 ac (14,756 sq. ft.)**	**0.06 ac (2,685 sq. ft.)**

Ac = acre; sq. ft. = square feet

2. Road Pools with Fairy Shrimp

A total of 5 road pools (RP Nos. 2, 3, 12, 16, and 17) with a combined area of 0.23 acre would be impacted by the project (Table 1; Figure 3). Road pools are distinguished from vernal pools by the absence of vernal pool indicator plant species. All five of these unvegetated road pools support San Diego fairy shrimp. One of these pools (RP No. 12) totaling 0.17 acre also supports the federally listed as endangered Riverside fairy shrimp (*Streptocephalus woottoni*). Like the impacted vernal pools, the road pools are located along the berms in an area of heavy OHV activity, which has created or enhanced depressions and compacted the soil, making it very difficult for native vegetation to become established. This compaction allows water to pond readily, even in a dry year when most natural vernal pools remain dry.

The impacted road pools lack vernal pool indicator plant species and are devoid of vegetation. Road pools in and of themselves are not a sensitive habitat requiring mitigation. In this case, however, because the road pools support the federally listed as endangered San Diego and Riverside fairy shrimp, impacts to the road pools are significant and require mitigation.

3. Other Jurisdictional Areas

In addition to the vernal pool and road pool impacts identified above, the project would impact approximately 0.02 acre of CDFG jurisdictional disturbed wetland and 0.04 acre of Corps and CDFG jurisdictional non-wetland Waters of the U.S./Streambed (Table 1; Figure 3). The disturbed wetland is located in Lot 4 and is dominated by non-native plant species including curly dock (*Rumex crispus*), mustard (*Brassica* sp.), fennel (*Foeniculum vulgare*), and Italian ryegrass (*Lolium multiflorum*). The impacted non-wetland Waters of the U.S./Streambed is an ephemeral drainage extending southward from the existing terminus of Caliente Avenue.

D. BURROWING OWL IMPACTS

Winter and spring CDFG (1995) protocol surveys for burrowing owl were conducted on January 23 and April 16, 2004, respectively. The surveys focused on, but were not limited to, portions of the site (as well as 500 feet off site) that had potential to contain burrows or to be used by owls as foraging habitat. Areas in the project vicinity that contain potential burrowing owl habitat include grasslands and disturbed habitat along earthen berms where vegetation is sufficiently open to support burrows. Protocol surveys for burrowing owl were negative. Evidence of an occupied burrow, however, was found along the northeastern edge of the project site during a 2004 summer rare plant survey. In addition, a burrowing owl was observed on a berm at the eastern property boundary during an on-site field meeting in October 2004. As such, implementation of the proposed project would impact burrowing owl habitat.

III. MITIGATION REQUIREMENTS

A. TYPE(S) OF VERNAL POOL HABITAT TO BE CREATED/ENHANCED

The total compensatory mitigation for impacts for the Candlelight Villas East project consists of on-site creation, preservation, and enhancement of vernal pool habitat; and off-site vernal pool preservation/enhancement (Table 2). Mitigation for impacts to the vernal pools and road pools with fairy shrimp would be conducted at a 2:1 ratio. ~~Half~~ A portion of this mitigation (1:1 ratio) would be met through vernal pool habitat creation on site and the remaining portion ~~other half~~ through a combination of on-site vernal pool preservation and enhancement of VP No. 1 and off-site vernal pool ~~preservation/enhancement~~creation within the Hidden Trails project site or possibly the Clayton Family Trust parcel, as approved by the USFWS.

Table 2
JURISDICTIONAL AREA MITIGATION REQUIREMENTS

Habitat Type	Impact	Mitigation				
		Ratio	Total Required	On-site Creation	On-Site Preserve	Off-Site Mitigation[1]
Disturbed wetland[2]	0.02	2:1	0.04	0.02	--	0.02
Vernal pool	0.07	2:1	0.14	0.07	0.05	0.02
Road pool[3]	0.23	2:1	0.46	0.23	--	0.23
Waters of the U.S./Streambed	0.04	1:1	0.04	0.04	--	--
TOTAL	**0.36**	--	**0.68**	**0.36**	**0.05**	**0.27**

[1]Off-site mitigation (within the Hidden Trails project site or possibly the Clayton Family Trust parcel, as approved by the USFWS) is not included in this report
[2]Mitigation provided with vernal pool habitat (higher quality wetland)
[3]Supporting listed fairy shrimp species

In addition, on-site vernal pool creation would take place as mitigation for impacts to disturbed wetland and non-wetland Waters of the U.S./Streambed. The non-wetland Waters of the U.S./Streambed would be entirely mitigated at a 1:1 ratio on site. Impacts to disturbed wetland would require mitigation at a 2:1 ratio, half of which (1:1 ratio) would be met through vernal pool habitat creation on site. The remaining mitigation requirement for vernal pools, road pools with fairy shrimp, and disturbed wetland also would be met through preservation/enhancement of appropriate habitat off site within the Hidden Trails project site or possibly the Clayton Family Trust parcel, as approved by the USFWS. Off-site mitigation on the Clayton Family Trust parcel or Hidden Trails parcel is not addressed in this restoration plan. An Off-site Vernal Pool ~~Mitigation~~ Restoration Plan, however, was prepared for the Hidden Trails project site (HELIX 2006b).

Incidental to vernal pool creation on site would be creation of maritime succulent scrub, as further described below.

1. Vernal Pool Creation

On-site vernal pool creation will be conducted within the previously disturbed agricultural field east of the proposed staging area within Lot 4 (Figure 4). A total of 0.34 acre of vernal pool habitat will be created to meet ~~half~~ a portion of the project habitat creation requirement (1:1 ratio). The on-site creation area is near the MHPA and adjacent to the successful Sweetwater Union High School District vernal pool restoration project. In addition to vernal pool surface area, ~~agricultural~~ land surrounding the created vernal pools will be preserved to maintain an adequate watershed area. The proposed watershed to pool ratio for the restoration site is approximately 6.5:1 (see Section VI.A).

The created vernal pools will support vernal pool plant indicator species (Corps 1997) and function as viable, self-sustaining vernal pool habitat. Additionally, the vernal pools will support San Diego and Riverside fairy shrimp. For a discussion of specific success criteria, please refer to Section V.

2. Vernal Pool Preservation/Enhancement

In addition to the on-site vernal pool creation described above, a single vernal pool (VP No. 1) on site with a surface area of approximately 0.05 acre will be preserved and enhanced (Figure 5). This preserved vernal pool, located along the berm in the eastern end of the site, would be enhanced to improve its long-term survival potential. Preservation alone may not ensure that this pool remains viable into the foreseeable future. The adjacent berm is cracked and sloughing, slowly filling the pool with sediment. Over time the pool may become completely filled in and no longer function as vernal pool habitat. In addition, the pool's current watershed is a long eroded channel that runs along the base of the berm. Water running down this channel picks up sediment form the berms and deposits it into the vernal pool. Enhancement activities in this pool would include removing trash and debris and taking out the failing berm. Removing the berm would create approximately 0.02 acre of additional vernal pool surface area, increasing the on-site vernal pool restoration total to 0.07 acre. No construction activities would occur within the preserved vernal pool itself.

3. Maritime Succulent Scrub Restoration

Maritime succulent scrub habitat will be restored adjacent to the vernal pool creation area (Figure 4). The upland component of a vernal pool complex is critical due to the relationship between the pools and their watersheds. All upland areas disturbed by restoration activities will be re-seeded and planted with maritime succulent scrub species. This includes any existing and restored mounded topography adjacent to the vernal pools. Additionally, all dirt roads, disturbed areas, non-native grassland habitat, and areas of ruderal vegetation within the preserve area will be weeded, de-compacted, and seeded. Approximately 1.86 acres of maritime succulent scrub habitat will be restored (Figure 4). For a discussion of specific success criteria, please refer to Section V.

B. BURROWING OWL PRE-CONSTRUCTION SURVEY AND PASSIVE TRANSLOCATION

This burrowing owl mitigation plan was developed under guidance provided by the CDFG Staff Report on Burrowing Owl Mitigation (CDFG 1995). This CDFG memorandum was developed to provide biological guidance, to address some of the inconsistencies in mitigation policy, and to provide standards for addressing the decline of burrowing owls in the State of California. This burrowing owl mitigation recommendation was also developed based on consideration of current and future site conditions, field review, and mitigation planning work.

To avoid injuring or killing burrowing owl during clearing and grading, a pre-construction survey of the areas where evidence of an occupied burrow was observed and where the burrowing owl was observed will be conducted. The survey will take place no more than 30 days prior to initiation of clearing and grading. If necessary, weed removal (by whacking, bush hogging, or mowing) will be conducted to make all potential burrows in the relevant impact area more easily observed. A qualified biologist will monitor weed removal to ensure that active burrows are not disturbed during the process. If owls are present, a qualified biologist will implement passive translocation with the use of one-way doors. Once it is believed that the owls have vacated the burrows (this should take approximately 48 hours after installation of one-way doors), all burrows will be carefully excavated (to confirm they are empty) and then filled to prevent occupation or reoccupation. A qualified biologist will carry out the excavation and filling.

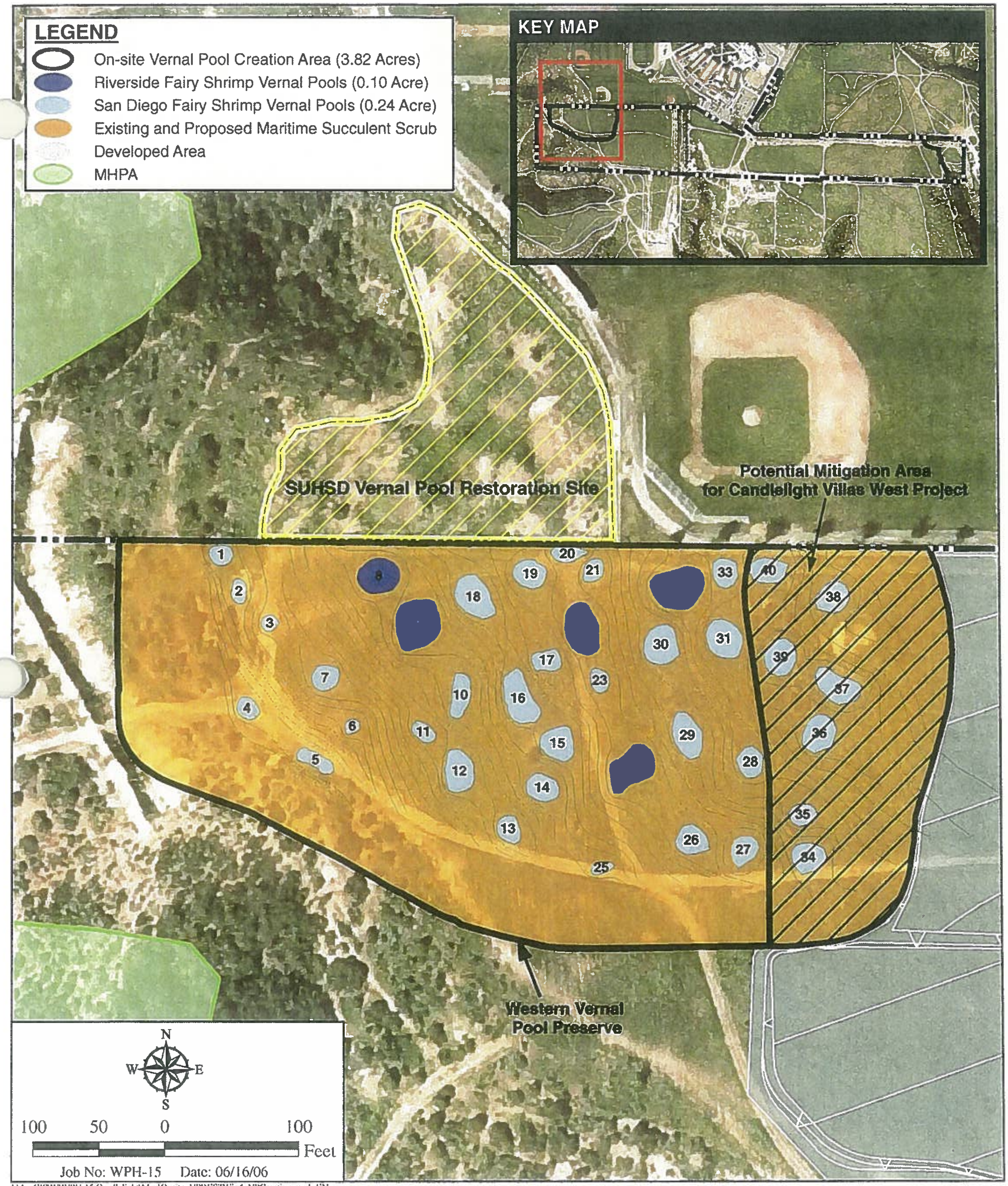
Burrowing owl mitigation is based on pre-impact construction of artificial burrows, vacating owls from any physically occupied burrows prior to their destruction, and ensuring long-term protection of habitat for the owls as well as other natural resources. All burrows are to be constructed prior to any clearing and grading impacts associated with the Candlelight Villas East project. Installation of the artificial burrows (described below and depicted in Figure 6) will be in place prior to passive translocation.

It is intended that this burrowing owl mitigation plan serve to completely mitigate all presently proposed impacts to the burrowing owl on site. If, however, additional burrowing owls are found in development areas, unrelated to the present mitigation program, additional mitigation may be required. To the extent feasible, any additional mitigation would be performed according to this burrowing owl mitigation plan.

IV. VERNAL POOL AND BURROWING OWL MITIGATION SITES

A. LOCATION AND SIZE OF VERNAL POOL MITIGATION AREAS

The on-site vernal pool creation will take place within a 2.20 acre preserve site located east of the proposed staging area within Lot 4 and south of the high school and existing vernal pool restoration project (Figure 4). A total of 33 pools with a combined surface area of approximately 0.34 acre would be created in this area. In addition, an approximately 0.05 acre vernal pool (VP No. 1) will be preserved and enhanced on the eastern end of the project site (Figure 5). The enhancement would add an additional 0.02 acre to the overall pool creation total.



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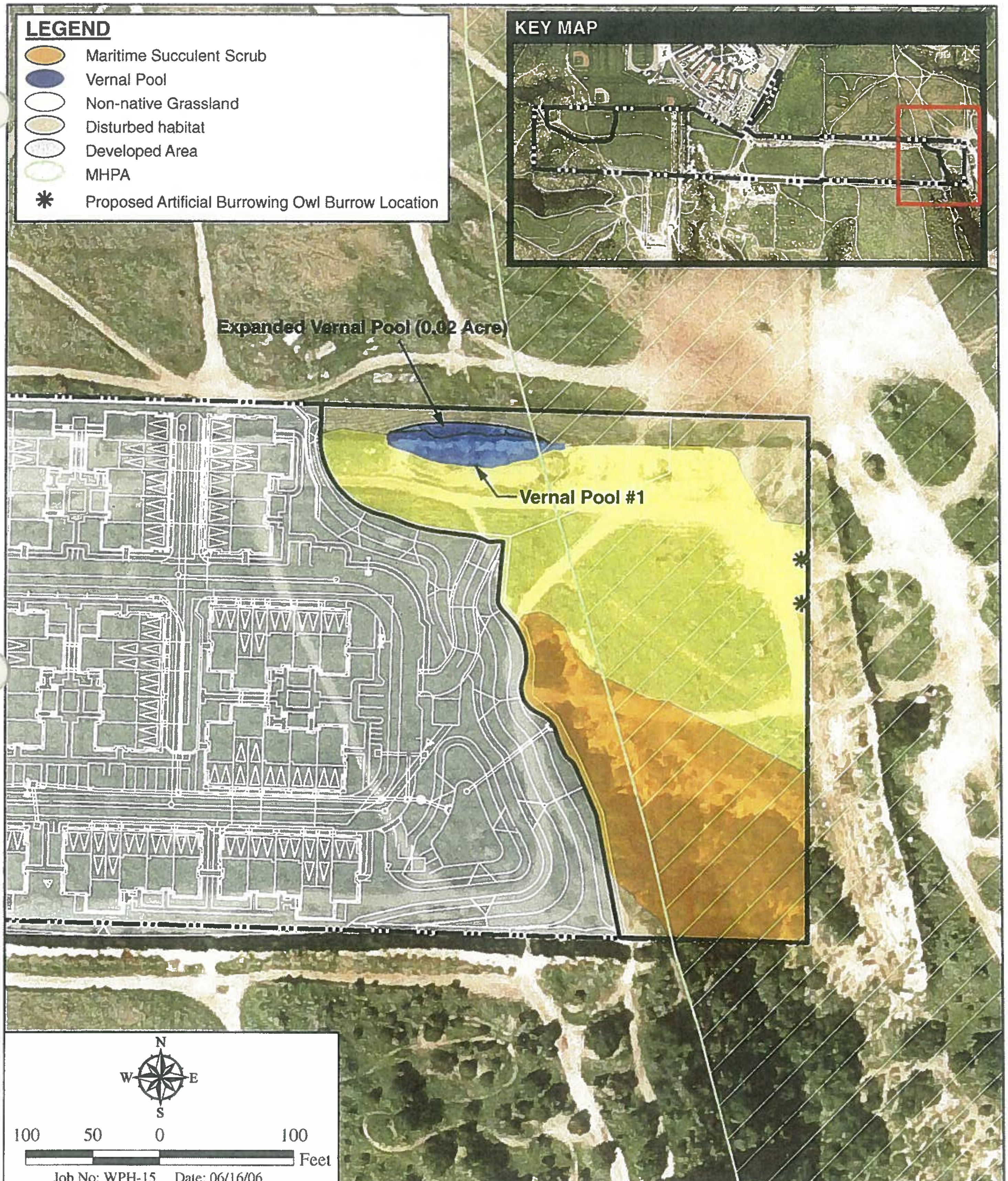
On-site Vernal Pool Creation Area

ON-SITE VERNAL POOL RESTORATION PLAN FOR CANDLELIGHT VILLAS EAST

HELIX

Figure 4



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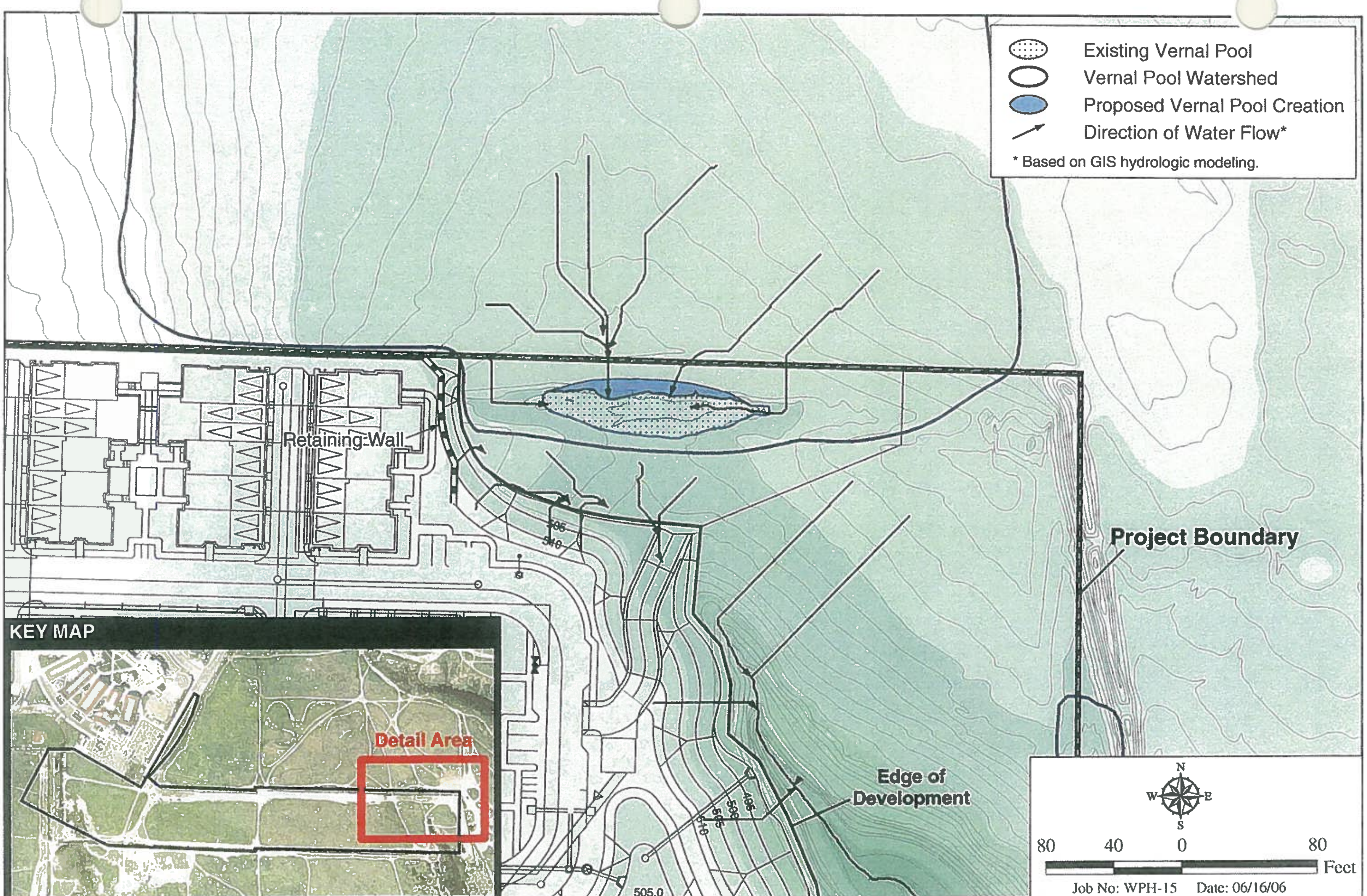
On-site Vernal Pool Preservation/Enhancement Area

ON-SITE VERNAL POOL RESTORATION PLAN FOR CANDLELIGHT VILLAS EAST

HELIX

Figure 5



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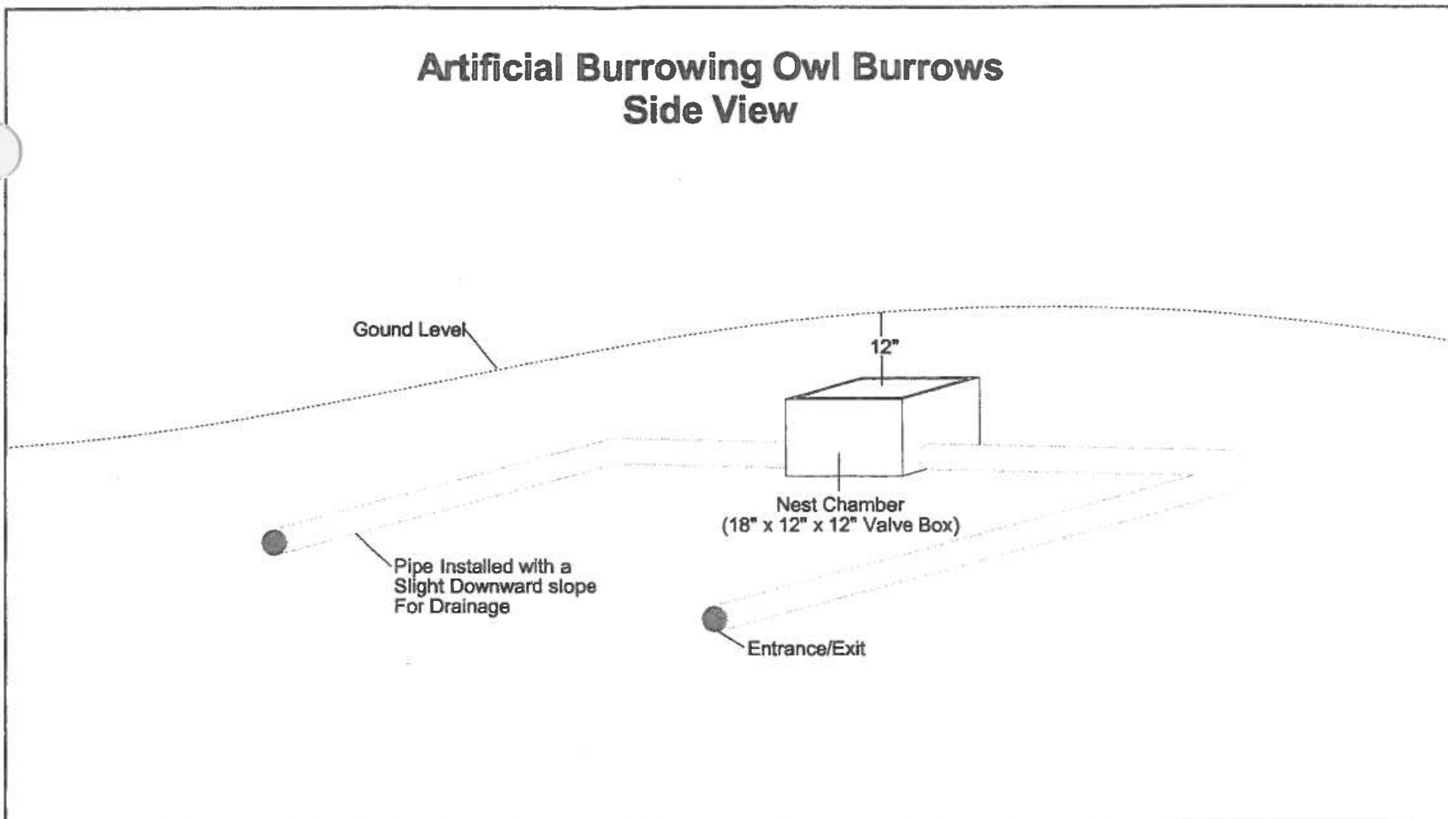
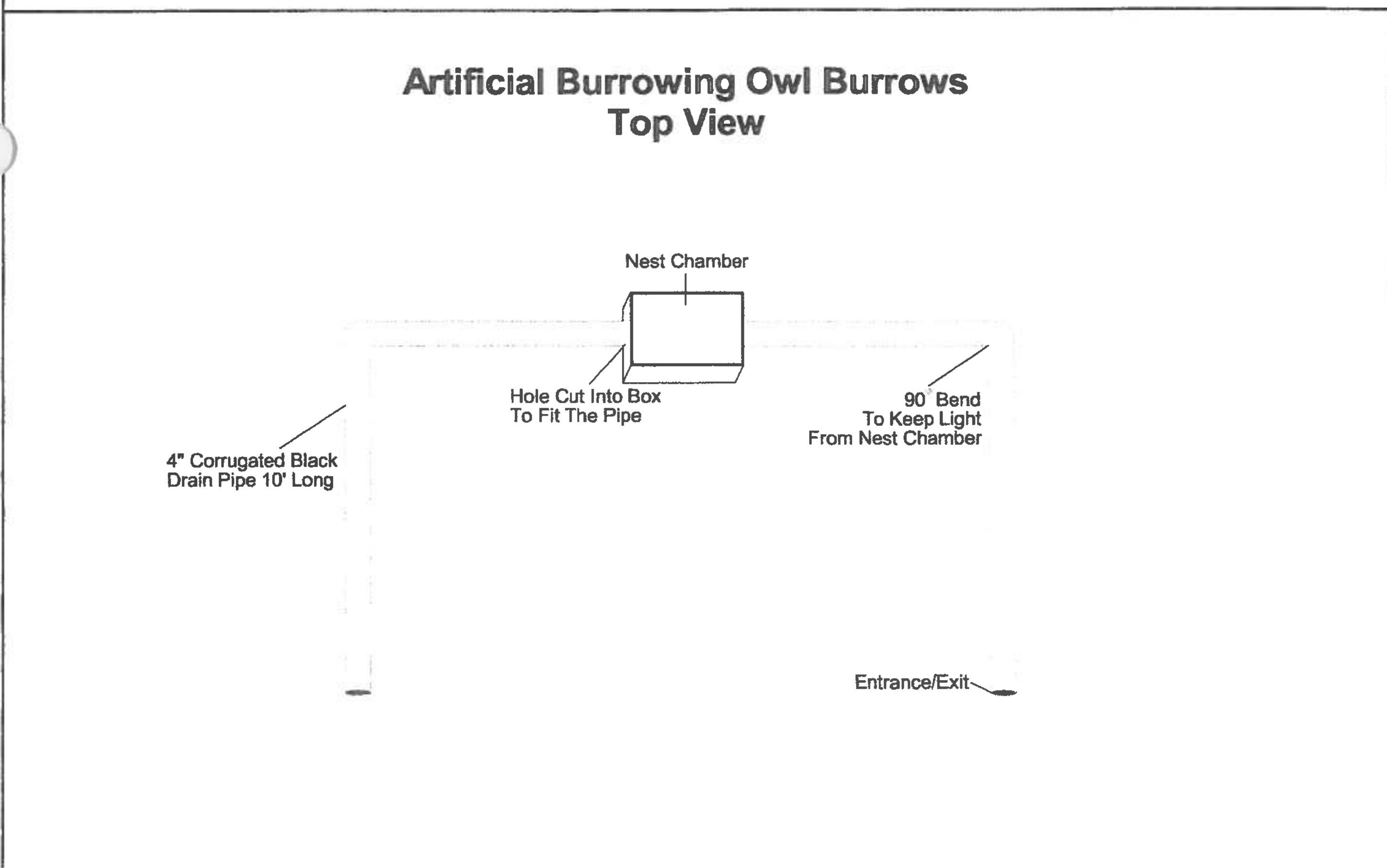
Post-construction Hydrologic Analysis

ON-SITE VERNAL POOL RESTORATION PLAN FOR CANDLELIGHT VILLAS EAST

HELIX

Figure 8





I:\ArcGIS\W\WPH-15 Candlelight\Data\wph-15.apr\VP Rest On-site - Fig 6

Artificial Burrowing Owl Burrows

B. LOCATION OF ARTIFICIAL BURROWING OWL BURROWS

The on-site artificial burrow creation would occur within the berm located at the eastern property boundary (Figure 5). According to the CDFG (1995) memorandum, two artificial burrows should be constructed for each active burrow impacted. Therefore, two artificial burrows shall be constructed for impacts resulting from the proposed project. The siting of these burrows takes into consideration factors that may affect burrow site suitability (for example, vegetative cover, relative elevation to surrounding landscape, distance from present/future development, and nearby human activity), spacing between burrows, availability of nearby foraging habitat, and threat of very localized events such as pets, fire, or vandalism.

C. OWNERSHIP STATUS

The on-site vernal pool mitigation area in the eastern portion of the site is adjacent to the MHPA while the on-site vernal pool mitigation area in the western portion of the site is near the MHPA and adjacent to an existing vernal pool restoration area. These on-site mitigation areas are owned by Western Pacific Housing, whose contact information follows:

Kevin Curtin, Project Manager
Western Pacific Housing
5790 Fleet Street, Suite 210
Carlsbad, California 92008
(760) 929-1600; Fax (760) 431-7842
kmcurtin@drhorton.com

Burrowing owl mitigation will be implemented by Western Pacific Housing to benefit the burrowing owl present on site. The artificial burrowing owl burrows will be located within the MHPA, which may be dedicated to the City, but will be managed by a non-profit land management organization.

D. EXISTING FUNCTIONS AND VALUES OF VERNAL POOL MITIGATION AREAS

The on-site vernal pool creation and preservation areas have been disturbed by agriculture, berm construction, OHV activity, and illegal dumping. The approximately 2.20 acre creation area is located in a fallow agricultural field that now supports non-native grassland habitat. Agricultural furrows are still evident and the site supports no vernal pools. Despite the previous agricultural activities, the creation area still exhibits some natural mounded topography, suggesting that the tilling was not very deep and that the underlying clay soils are still intact. The adjacent vernal pool restoration site was in the same condition prior to restoration and now, five years after installation, it supports successful restored vernal pool habitat. High quality maritime succulent scrub habitat also occurs immediately to the west of the vernal pool creation area.

The on-site preserved vernal pool (VP No. 1) is located east of the proposed development along the berm that marks the northern project boundary. This vernal pool is highly disturbed and is subject to regular dumping of trash. This vernal pool has a low native species diversity and supports several non-native weed species. The area surrounding the vernal pool has been heavily impacted by OHV use and supports either bare ground or non-native grassland habitat. A pre-construction hydrologic analysis was prepared for VP No. 1 (Figure 7). This analysis depicts the vernal pool, its watershed, and the general direction of water flow into the vernal pool.

V. SUCCESS CRITERIA

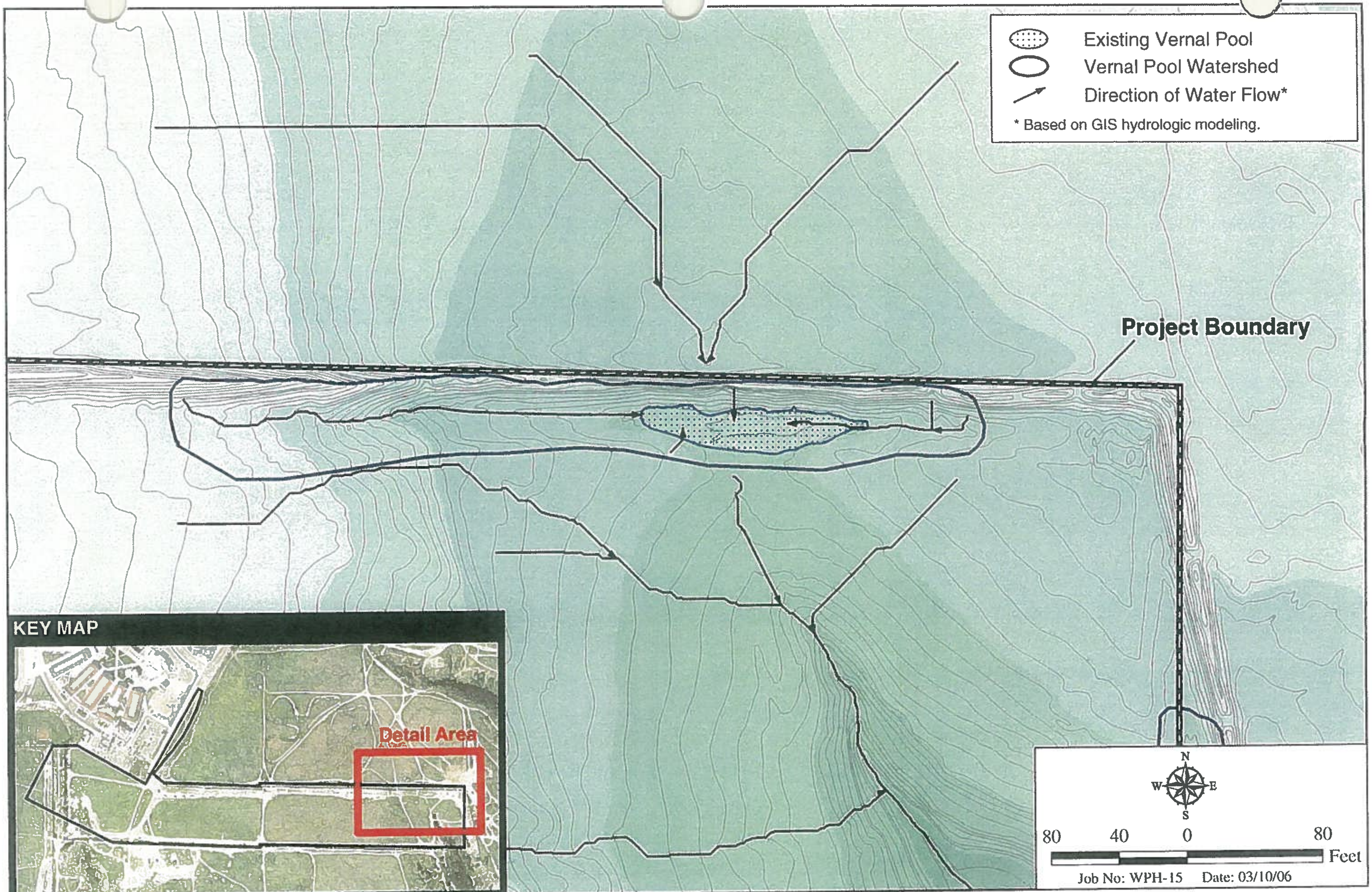
As discussed in Section III.A, mitigation for wetland impacts will consist of a minimum of 0.36 acre of created vernal pool habitat on site (0.34 acre in the creation area in the western portion of the site and 0.02 acre within VP No. 1 in the eastern portion of the site. The following sections provide standards to determine the successful completion of the five-year mitigation and monitoring program. Attainment of these standards indicates the mitigation areas are progressing toward the habitat functions and values specified for this plan. Methods used to measure these success criteria are described in the following text.

The CDFG, Corps, USFWS, and City may terminate monitoring earlier than five years if success criteria are met and it is recommended by the restoration specialist in a year-end report. Likewise, if the restored areas fail to meet the Year 5 standards after the full monitoring term, a specific set of remedial measures (approved by the CDFG, Corps, USFWS, and City) will be implemented, and the monitoring and maintenance period will be extended until all Year 5 standards are met or as otherwise provided in this document. Only areas failing to meet the success standards will require additional work (i.e., not all of the areas originally restored).

A. CONTROL POOLS

In order to measure the success of the restored and created vernal pools, 10 off-site preserved pools in Otay Mesa will serve as control pools. Eight of the control pools are located in the eastern portion of Otay Mesa on the Upham parcel. This parcel was previously being managed as a habitat preserve by the Environmental Trust (TET). The pools on this site are within the J-26 complex (Bauder 1986). While not being actively managed, the J-26 pools are protected from cattle and OHV impacts by a barbed wire fence, making it a reliable control site. HELIX has been collecting data from the pools in this complex each year since 2000. The remaining two control pools are located on the Robinhood Ridge vernal pool preserve. HELIX is currently monitoring these control pools for several other vernal pool restoration projects in the area. These same control pools will be used for the current restoration effort. The control pools are of similar depth and vegetative makeup as those proposed for the mitigation site.

A total of 11 native vernal pool plant indicator species and 2 native wetland associated species occur in the control pools (Table 3). The mean vernal pool indicator richness for 2005 was 3.6 species per pool. This richness is typical of what has been observed in the control pools over the last five years. In 2003, the average total vernal pool plant cover in the control pools ranged from 1_to 95 percent with a combined average of approximately 20 percent. In 2004, native cover varied from 1 to 60 percent, with an average of 13.5 percent. In the exceptionally wet 2005 rainy season, the mean vernal pool plant cover in the control pools ranged from 2to 47 percent, with an average of 20 percent.



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Pre-construction Hydrologic Analysis

ON-SITE VERNAL POOL RESTORATION PLAN FOR CANDLELIGHT VILLAS EAST

HELIX

Figure 7

Table 3 CONTROL VERNAL POOL PLANT SPECIES	
COMMON NAME	**SCIENTIFIC NAME**
Vernal Pool Indicators[1]	
Annual hairgrass	*Deschampsia danthonoides*
Chaffweed	*Centunculus minimus*
Crassula	*Crassula aquatica*
Flowering quillwort	*Lilaea scilloides*
Long-stalk water-starwort	*Callitriche marginata*
Otay mesa mint	*Pogogyne nudiuscula*
Plantago	*Plantago elongata*
San Diego button-celery	*Eryngium aristulatum* var. *parishii*
Smooth boisduvalia	*Epilobium pygmaeum*
Spreading navarretia	*Navarretia fossalis*
Woolly marbles	*Psilocarphus brevissimus*
Other Native Wetland Species	
Common toad-rush	*Juncus bufonius*
Pale spike-sedge	*Eleocharis macrostachya*

[1]Based on Corps Vernal Pool Plant Indicator List (Corps 1997)

Success of the created vernal pools will be determined by comparing species richness and vegetative cover with the control pools. A transect/quadrat sampling method has been proposed to monitor the created pools (described in Section VIII.A). Permanent transects and decimeter quadrats have been established within the control pools and also will be established in the created pools. Each year species richness and vegetative cover within the quadrats will be measured and recorded. This data will be used to determine if the created pools have met the success criteria described below.

B. VERNAL POOL INDICATOR SPECIES RICHNESS

Only native vernal pool indicator species (Corps 1997) will be included in the measurement of species richness in any of the monitored vernal pool quadrats. Species richness refers to the number of species in a given area. Within the vernal pool quadrats, species richness is determined by counting individual plants. For some difficult to count species (i.e., American pillwort [*Pilularia Americana*]) the species count is visually estimated. Annual performance goals, expressed as a percent of vernal pool indicator species in control pools, are 35, 50, 65, and 80, respectively, for Years 1 through 4 (Table 4). Acceptable species richness within each of the restored/created pools at the end of the five-year monitoring period will be 100 percent of the average control pool vernal pool species richness. Meeting the 100 percent criterion by Year 5 will show that the pools are functioning and that they would be expected to continue functioning. If the species richness goal for a given year is not met, corrective measures (e.g., reseeding, excavation of a portion of a basin, introducing new inoculum, berming of a pool edge, etc.) would be taken to ensure eventual achievement of the long-term goals.

Table 4 VERNAL POOL SPECIES RICHNESS SUCCESS CRITERIA	
YEAR	RESTORED AND CREATED VERNAL POOLS[1,2]
1	35
2	50
3	65
4	80
5	100

[1]Percent of relative indicator cover in control pools
[2]Greater than or equal to amount shown

C. VEGETATIVE COVER OF VERNAL POOL INDICATOR SPECIES

In addition to species richness, cover of vernal pool plant indicator species within the pools will be used to determine project success. Cover is defined as the percentage of an area covered by a given species or group of species. Two types of cover, total and relative, are measured in the vernal pool quadrats during the annual monitoring. Total cover is the sum of cover values for each plant in the quadrat. Total cover may exceed 100 percent, especially for multiple species in a multi-strata system. For example, in a quadrat with two species having individual cover values of 75 and 90 percent, respectively, the total cover would be 165 percent. During the annual monitoring, the total cover is measured for each quadrat, but is not used to determine project success.

Relative cover is the cover of one species as a percent of total plant cover; relative cover sums to 100 percent. Relative cover of vernal pool indicator species is used to evaluate the success of the restoration effort. During the annual monitoring event the cover of each plant species (indicator and non-indicator) within the quadrat is visually estimated. From this the relative vernal pool indicator cover is determined. At the end of the five-year monitoring period, the relative cover of vernal pool plant species in each restored vernal pool should be 100 percent of the average relative cover value for the control pools. Yearly performance goals have been set to track the progress of the mitigation effort (Table 5). After the first year, the relative cover in each of the restored vernal pools should be at least 25 percent of the average relative cover measured in the control pools for the same year. This percentage is expected to increase annually relative to the control pools. For Years 2 through 5, the percentage should be 35, 50, 70, and 100 percent, respectively. If the annual goals for relative cover are not being met, additional measures will be taken as necessary to ensure final success.

Table 5 VERNAL POOL RELATIVE COVER SUCCESS CRITERIA	
YEAR	RESTORED AND CREATED VERNAL POOLS[1,2]
1	25
2	35
3	50
4	70
5	100

[1]Percent of relative indicator cover in control pools
[2]Greater than or equal to amount shown

D. WEED COVER

Non-native weed species anticipated to encroach upon the vernal pools include African brass buttons (*Cotula coronopifolia*), grass poly (*Lythrum hyssopifolium*), curly dock (*Rumex crispus*), rabbitsfoot grass (*Polypogon monspeliensis*), filaree (*Erodium* spp.), and Italian ryegrass. Of these weed species, only Italian ryegrass is considered to be a significant competitor to native vernal pool indicator species. Elimination of this species will be the main focus of the vernal pool weed control effort. Relative cover of Italian ryegrass shall not exceed one percent during the five-year monitoring period. Control of other weed species shall be conducted such that at the end of the five-year monitoring period the relative cover of weed species in each restored vernal pool does not exceed five percent.

E. FAIRY SHRIMP

The created vernal pools are intended to support San Diego and Riverside fairy shrimp. Of the 33 created pools, 5 would be deep enough to support Riverside fairy shrimp. The combined surface area of the Riverside fairy shrimp pools is approximately 0.10 acre. The remaining 28 created vernal pools (0.24) would be shallower and support San Diego fairy shrimp. At the end of the five-year monitoring period these pools will support reproducing populations of San Diego and Riverside fairy shrimp.

F. OTHER TARGET SPECIES

This plan includes restoration and creation of vernal pool habitat on site. Floral and faunal species composition within the restored/created pools is expected to be similar to that of existing pools in the Otay Mesa area. Table 6 presents a list of plant and animal species anticipated to occur in the created pools. The presence and abundance of these species is dependent upon the location of suitable seed/inoculum.

Table 6
TARGET VERNAL POOL PLANT SPECIES[1]

COMMON NAME	SCIENTIFIC NAME
Vernal Pool Indicators[2]	
American pillwort	*Pilularia americana*
Annual hairgrass	*Deschampsia danthonoides*
California orcutt's grass	*Orcuttia californica*
Flowering quillwort	*Lilaea scilloides*
Hairy water clover	*Marsilea vsetita*
Little mousetail	*Myosurus minimus*
Long-stalk water-starwort	*Callitriche marginata*
Otay mesa mint	*Pogogyne nudiuscula*
Plantago	*Plantago elongata*
Popcorn flower	*Plagiobothrys acanthocarpus*
Pygmy weed	*Crassula aquatica*
Quillwort	*Isoetes orcuttii*

Table 6 (cont.) TARGET VERNAL POOL PLANT SPECIES[1]	
COMMON NAME	**SCIENTIFIC NAME**
Vernal Pool Indicators[2] (cont.)	
San Diego button-celery	*Eryngium aristulatum* var. *parishii*
Spreading navarretia	*Navarretia fossalis*
Waterwort	*Elatine brachysperma*
Woolly marbles	*Psilocarphus brevissimus*
Other Wetland Species	
Common toad-rush	*Juncus bufonius*
Pale spike-sedge	*Eleocharis macrostachya*
Fauna List	
Copepods	*Acanthocyclops* sp.
San Diego fairy shrimp	*Branchinecta sandiegonensis*
Riverside fairy shrimp	*Streptocephalus woottoni*
Seed shrimp	Ostracod species
Water fleas	*Daphnia* sp.

[1]Additional inoculum is required to achieve presence of all target species
[2]Based on Corps Vernal Pool Plant Indicator List (Corps 1997)

G. TARGET HYDROLOGICAL REGIME

Pools restored by the mitigation program are primarily designed to emulate the conditions found in existing vernal pools on Otay Mesa. The created pools will be excavated and situated to capture rainfall and runoff from the preserve surface area. Restoration of the natural topography and de-compaction of the roads in the preserve area will restore the normal hydrological functions within the created vernal pool complex. A post-construction hydrologic analysis (Figure 8) depicts VP No. 1 and its watershed following project implementation and vernal pool creation and enhancement.

During the five-year monitoring period, water depth in the control pools and the created vernal pools on site will be measured. Measurements will be taken every two weeks during each rainy season throughout the monitoring period. The depth and extent of ponding (surface area) will be recorded at each site visit. This data will be used to create graphs showing depth and duration of ponding. At the end of the five-year monitoring period the monitored pools will demonstrate hydrologic patterns similar to those of the control pools. The monitoring period may have to be extended if a drought period prevents the pools from demonstrating the desired hydrologic patterns.

H. SUCCESS CRITERIA FOR MARITIME SUCCULENT SCRUB RESTORATION AREA

During annual monitoring, species richness in the maritime succulent scrub restoration area will be determined only by visual assessment in Years 1 and 2 and by visual assessment and transect data in Years 3, 4, and 5. No specific richness criteria are established for Years 1 or 2, but annual success criteria for species richness in Years 3, 4, and 5 are provided in Table 7. If the species richness goal for a given year is not met, corrective measures (including reseeding and planting) must be implemented to ensure achievement of long-term restoration goals.

Table 7 MARITIME SUCCULENT SCRUB RESTORATION AREA SPECIES RICHNESS SUCCESS CRITERIA	
YEAR*	NUMBER OF SPECIES
3	6
4	8
5	10

*No success criteria for Years 1 and 2

In addition to species richness, project success will be determined based on native and non-native (weed) plant cover. Table 8 presents, vegetative cover success criteria for Years 3, 4, and 5 in the maritime succulent scrub restoration area. No specific richness criteria are established for Years 1 or 2 in the maritime succulent scrub restoration area. If annual goals for vegetative cover are not met, remedial measures, including reseeding, planting, and weeding may be implemented to ensure final success.

Table 8 MARITIME SUCCULENT SCRUB RESTORATION AREA VEGETATIVE COVER SUCCESS CRITERIA (percent)		
YEAR*	NATIVE SPECIES	WEEDS†
3	50	10
4	60	5
5	75	5

*No success criteria for Years 1 and 2

†Includes species listed as High or Moderate in the California Invasive Plant Council (Cal-IPC) ~~List A species~~2006 Invasive Plant Inventory; numbers shall be less than or equal to that shown

I. SUCCESS CRITERIA FOR ARTIFICIAL BURROWS

The degree to which burrowing owls utilize artificial burrows and foraging habitat shall be documented through the monitoring program. If this burrowing owl mitigation plan is implemented correctly, and burrowing owls are not found to be utilizing the artificial burrows or preserved foraging habitat, there shall be no consequences for Western Pacific Homes. Implementation of this burrowing owl mitigation plan is considered successful mitigation.

VI. IMPLEMENTATION PLAN

A. RATIONALE FOR EXPECTING IMPLEMENTATION SUCCESS

The area selected for vernal pool creation currently supports non-native grassland habitat. This plan would enhance the area with maritime succulent scrub, create vernal pool surface area, and create two artificial burrowing owl burrows.

A watershed analysis of several mound and basin vernal complex maps from Kearny Mesa and Otay Mesa found watershed to pool surface area ratios as low as 4:1, and commonly 6:1 or 7:1 (RECON 1997). Studies have shown that direct precipitation plays a more important role in pool filling than watershed contributions in more porous soils (Hanes and Stromberg 1998) while subsurface flow may have an effect on the duration of ponding.

It is anticipated that the planned watershed to pool ratio will be sufficient to support the created pools. The planned watershed to pool ratio of the creation area is 6.5:1. This ratio is similar to, or larger than other vernal pool complexes in the Otay Mesa area. Additionally, the project team is comprised of a number of individuals who have been involved in the successful implementation of several vernal pool restoration efforts in San Diego and Riverside counties.

B. RESPONSIBLE PARTIES

1. Project Proponent

The permittee, Western Pacific Housing, will be responsible for financing the installation, maintenance, and monitoring of the vernal pool mitigation measure (see Section III.A) as well as installation and monitoring of the burrowing owl mitigation measure (Section III.B).

2. Habitat Restoration Specialist and Burrowing Owl Translocation Specialist

Overall supervision of the installation, maintenance, and monitoring of this mitigation project will be the responsibility of a habitat restoration specialist with vernal pool restoration experience and a burrowing owl translocation specialist with appropriate experience. The habitat restoration specialist specialist will educate all participants with regard to mitigation goals and requirements, and directly oversee grading, excavation and placement of salvaged topsoil for vernal pool creation/enhancement. The burrowing owl translocation specialist also will educate all participants with regard to mitigation goals and requirements, and directly oversee installation of artificial owl burrows and translocation of owls. If necessary, the habitat restoration specialist and burrowing owl translocation specialist will provide the permittee and contractor with a brief report, including a written list of items in need of attention following each monitoring visit. The contractor will be responsible for carrying out all required measures in a timely manner. The habitat restoration specialist and burrowing owl translocation specialist will notify the contractor and responsible party if any requested remediation is not addressed.

The habitat restoration specialist and burrowing owl translocation specialist will be a permitted biologist who will directly supervise all vernal pool creation, restoration, and maintenance as well as burrowing owl installation. The specialist for this project will be:

Greg Mason, Restoration Specialist (TE778195)
HELIX Environmental Planning, Inc.
7578 El Cajon Blvd., Suite 200La Mesa, California 91941
(619) 462-1515; Fax (619) 462-6552
gregm@helixepi.com

Mr. Mason has several years of experience conducting vernal pool and fairy shrimp restoration projects in San Diego and Riverside Counties. HELIX Senior Biologist W. Larry Sward, and Biologist Dale Ritenour also are permitted (TE778195) to work with fairy shrimp and related restoration projects and may directly supervise restoration and maintenance activities in the absence of Mr. Mason. Mr. Mason also has several years of experience conducting burrowing owl burrow restoration projects in San Diego and Riverside Counties.

3. Installation/Maintenance Contractor

HELIX in-house construction and maintenance personnel will serve as the installation and maintenance contractor for this mitigation plan. The construction personnel will, under the direction of the restoration and burrowing owl translocation specialist, be responsible for completion of grading, weed control, planting, seeding, and maintenance of the created and enhanced vernal pools and creation and installation of the artificial burrows. The restoration and burrowing owl translocation specialist will educate the contractor(s) on the installation and maintenance of vernal pool plant species and artificial burrows.

After the creation of vernal pools and installation of vernal pool plant species is complete, HELIX maintenance personnel will initiate the five-year maintenance program under the direction of the restoration specialist. Maintenance crews will service the entire restoration area at least once per month. Service will include but not be limited to weed control, trash removal, watering, fence repair, dead plant replacement, and re-seeding. All activities conducted will be seasonally appropriate and approved by the restoration specialist. The maintenance crew will meet the restoration specialist at the site when requested and will perform all checklist items in a timely manner as directed by the project proponent. The restoration specialist will ensure that maintenance personnel are capable of discerning between native plant species and non-native weed species.

C. VERNAL POOL IMPLEMENTATION SCHEDULE

Implementation of the vernal pool mitigation program is expected to begin in the fall of 2006, provided that weather and soil conditions are dry enough to conduct the restoration without causing irreparable damage to the surrounding habitat. No activities will be conducted within the vernal pools unless approved by the Corps, CDFG, and USFWS. In order to obtain this approval, the following conditions must be met:

1. Grading will occur only when the soil is dry to the touch both at the surface and one inch below, and a visual check for color differences (i.e., darker soil indicating moisture) in the soil between the surface and one inch below indicates the soil is dry.

2. After a rain of greater than 0.2 inch, grading will occur only after the soil surface has dried sufficiently as described above and no sooner than two days (48 hours) after the rain event ends.

3. Grading will commence only when no rain is forecast during the anticipated grading period.

4. To prevent erosion and siltation from stormwater runoff due to unexpected rains, Best Management Practices (i.e., silt fences and fiber rolls) will be implemented as needed during grading.

5. If rain occurs during grading, work will stop and only resume after soils are dry as described above.

Initial activities will include marking of all restoration areas, impacted pool inoculum salvage, weed and trash removal and pool grading. Grading of the created vernal pools will start once the site has been cleared of all trash and debris. Seeding of upland/inter-pool areas will begin when pool grading is complete. The entire restoration is anticipated to be complete within four weeks of starting. Monitoring of the restoration effort will begin immediately following installation. The monitoring program will continue for a five-year period. Field surveys will be completed on a bi-weekly basis during the rainy season and monthly during the dry season each year with an annual report being prepared and distributed by September. The results of the annual reports will be used to determine the success of the restoration effort and to determine any remedial actions necessary. At the end of the five-year period, a final report will be produced.

D. ARTIFICIAL BURROW IMPLEMENTATION SCHEDULE

Implementation of the burrowing owl mitigation program also is expected to begin in fall 2006, provided that weather and soil conditions are dry enough to conduct the artificial burrow installation without causing irreparable damage to the berm. No activities will be conducted unless approved by the Corps, CDFG, and USFWS. In order to obtain this approval, the following condition must be met:

1. Implementation of passive translocation with the use of one-way doors and excavation shall not occur during the burrowing owl breeding season (April 15 through July 15) unless it is believed that the owls have vacated the burrows.

E. HABITAT RESTORATION SITE PREPARATION

The intent of this plan is to enhance and create vernal pool habitat in the on-site mitigation areas. Compacted roads and upland areas will be de-compacted to increase soil permeability and the potential for establishment of native maritime succulent scrub habitat. All weeds, refuse, debris, and deleterious soil will be removed and disposed of in a licensed landfill.

1. Topography/Hydrology

The created/enhanced pools (Figures 4 and 5) will be formed to replicate hydrologic conditions of existing vernal pool habitat in Otay Mesa. Enhancement of the preserved vernal pool (VP No. 1) will include berm removal, minor recontouring (of the berm location), trash removal, and incorporation in the overall vernal pool weeding program. A post-construction hydrologic analysis (Figure 8) depicts VP No. 1 and its watershed following project implementation and vernal pool creation. Material removed during pool excavation will be used to construct the mima mounds on site forming pool boundaries. Existing roads and disturbed upland areas will be re-graded to restore natural hydrologic conditions of the preserve areas.

2. Grading

Grading of the proposed restoration areas will begin in fall 2006 provided conditions are favorable and approved by CDFG, Corps, and USFWS (refer to Section VI.C). The revegetation specialist will mark all areas to be graded. Existing sensitive habitats and plants also will be marked as avoidance areas. An on-site meeting will be held with the restoration specialist and all installation personnel to identify sensitive areas and devise a strategy for avoidance prior to initiation of restoration activities. Sensitive areas to be avoided will be clearly marked with stakes and flagging. A staging area will be established outside of the on-site vernal pool restoration area. Grading shall be implemented using small rubber-tired loaders and tracked dozers with ripping tines and slope boards. All vehicles and construction equipment will be restricted to the staging areas when not required for restoration activities.

3. Road De-compaction

All dirt roads and trails within the western creation area will be ripped to a depth of six to eight inches prior to seeding with maritime succulent scrub seed. Following road de-compaction, the upland seed (Section VI.F.2) mix will be applied at the beginning of the rainy season to maximize the potential for germination.

4. Fencing

Prior to and during construction, a temporary orange construction fence will restrict access to the pool creation and preservation areas. A permanent view fence will be constructed along the boundary of the adjacent development (Figure 3) preventing OHV and pedestrian use of the preserve area. The permanent fence will be constructed as part of the Candlelight Villas East project and is not a component of this restoration plan. Steel signs attached to the fence at regular intervals will provide notice in both Spanish and English that the area is an ecological preserve and that trespassing is prohibited.

F. HABITAT RESTORATION PLANTING PLAN

1. Vernal Pools

Restoration of the native vernal pool habitat on site requires the reintroduction of plants and animals in addition to the physical construction described above. Partly because vernal pools recur reliably in the same location year after year, many vernal pool species are adapted for a strategy of non-dispersal (Zedler 1990). As a result, the restoration of vernal pool habitat can be greatly accelerated by the active transport of propagules from donor sites into the restored pools (Scheidlinger et al. 1985). While only a small amount of vernal pool vegetation was observed in the existing pools on site, it is likely that vernal pool plant seed, spores, bulbs, cysts and other propagules are present in the soil. Prior to construction, vernal pool topsoil will be collected and stored. The collected inoculum from each pool will be labeled and kept separate from inoculum collected from other pools. Hand tools (i.e., shovels and trowels) will be used to remove the first two inches of soil from the existing pools.

Each of the restored/created pools will receive a share of the total collected pool material proportionate to its surface area. The collected soils will be spread out and raked into the bottoms of the restored/created pools. The soil from the basin that support Riverside fairy shrimp will only be transferred to the deepest creation pools, where the habitat is appropriate for the species.

Because of the low quality of the on-site pools, off-site inoculum will be required to supplement the on-site salvaged soils. Potential sources of inoculum include other vernal pool restoration projects being conduced by HELIX in Otay Mesa. Care will be taken to minimize the introduction of weed seeds into the restored vernal pools. Prior to the use of off-site inoculum, the restoration specialist will contact the appropriate resource agencies (CDFG, Corps, and USFWS) for approval. None of the collected inoculum (on- and off-site) will be mixed between pools. In addition, the inoculum placed in any created pool will come from a single pool and will not be mixed with any other inoculum collected elsewhere.

2. Upland Restoration

Native plants salvaged from portions of the project site affected by construction will be transplanted to upland areas around the created pools. Upland seeding also will take place in all graded and re-contoured areas (excluding basins) within the vernal pool creation area (Figures 4 and 5). This area has been disturbed and may be further disturbed by restoration activities. Restoration of this habitat is critical to the overall success of this vernal pool mitigation plan. Without vegetative cover to control erosion, the pools may fill with materials washed in from the adjacent upland areas. Within the upland area the target vegetation habitat will be maritime succulent scrub. A seed mix of maritime succulent scrub plant species from the project vicinity will be applied by hand and container stock of maritime succulent scrub from the project vicinity will be installed. Specifications for the container stock and seed mix are included in Tables 9 and 10, respectively. The amount of container stock or seed for each species is dependent upon the location of a suitable seed source in the project vicinity. It may be necessary to complement the collected seed with sources outside of the immediate project vicinity. Additional transplants of cactus (cholla) would be included in upland restoration.

Table 9
MARITIME SUCCULENT SCRUB CONTAINER STOCK PLANT PALETTE

Scientific Name	Common Name	Spacing On Center (ft.)	Grouping Size	Number Per Acre	Number To Be Ordered**
Euphorbia misera	Cliff spurge	4	8	10	19
Isomeris arborea	Bladderpod	5	3	10	19
Malosma laurina	Laurel sumac	6	4	5	10
Opuntia littoralis	Coastal prickly pear	4	4	10	19
Opuntia prolifera	Cholla	4	4	10	19
Rhus integrifolia	Lemonadeberry	6	4	5	10
Simmondsia chinensis	Jojoba	6	4	20	37
Yucca schidigera	Mojave yucca	5	3	5	10
Artemisia californica	California sage brush	5	3	20	37
Eriogonum fasciculatum	Flat-top buckwheat	5	3	20	37
			TOTAL	115	217

*All container stock will be 1 gallon
**Based on 1.86 acres

Table 10~~9~~
MARITIME SUCCULENT SCRUB SEED MIX[1]

SPECIES	POUNDS/ACRE[2]
Bladderpod (*Isomeris arborea*)	1
California encelia (*Encelia californica*)	3
California sage brush (*Artemisia californica*)	2
Chia (*Salvia columbariae*)	1
Cholla (*Opuntia prolifera*)	0.5
Cliff spurge (*Euphorbia misera*)	0.5
Deerweed (*Lotus scoparius*)	3
Fascicled tarweed (*Deinandra fasciculata*)	5
Flat-top buckwheat (*Eriogonum fasciculatum*)	2
Golden yarrow (*Eriophyllum confertiflorum*)	2
Goldfields (*Lasthenia californica*)	1
Jojoba (*Simmondsia chinensis*)	4
Lemonadeberry (*Rhus integrifolia*)	2.5
Purple needlegrass (*Nassella pulchra*)	3
San Diego barrel cactus (*Ferocactus viridescens*)	0.5
San Diego bur sage (*Ambrosia chenopodifolia*)	3
San Diego sunflower (*Viguiera laciniata*)	3
White sage (*Salvia apiana*)	1
Black sage (*Salvia mellifera*)	2
TOTAL	40

[1]Maritime succulent scrub species collected adjacent to site
[2]Seeding rates are dependent on availability of seed material

G. IRRIGATION PLAN

No irrigation is planned or considered necessary for this project.

H. ARTIFICIAL BURROWING OWL INSTALLATION

The artificial burrows will be constructed based on CDFG staff recommendations (CDFG 1995) or other more currently accepted burrow designs. As previously stated, the artificial burrows will be installed within the berm along the eastern property boundary. Above-ground mounds of soil will be topped with rocks to prevent erosion of the soil beneath and growth of vegetation on top of the burrow. A stake/post will be provided adjacent to each artificial burrow to provide a perch. To prevent extensive growth of vegetation around each artificial burrow, gravel will be placed on the soil surface for a 10-foot radius around each artificial burrow. Then, the soil in a 50-foot radius (including the 10-foot radius) around each burrow will be compacted. The 40-foot radius beyond the area with gravel will be seeded with low-growing species such as California poppy (*Eschscholzia californica*), purple needle-grass (*Nassella pulchra*), golden yarrow (*Eriophyllum confertiflorum*), and plantain (*Plantago erecta*).

I. HABITAT AND ARTIFICIAL BURROW AS-BUILT CONDITIONS

The revegetation specialist shall submit to the City, Corps, CDFG, and USFWS, within six weeks of completion of site preparation and planting, a topographic map showing the as-built conditions of the vernal pool mitigation areas. Areas of grading and seeding shall be shown on the map. The revegetation specialist shall submit to the City, USFWS, and CDFG within six weeks of completion of installation of artificial burrows and planting, a topographic map showing the as-built conditions of the artificial burrows.

VII. MAINTENANCE DURING MONITORING PERIOD

A. HABITAT MAINTENANCE ACTIVITIES

A five-year maintenance program is proposed to ensure the successful establishment and persistence of the restored/created vernal pool habitat. The maintenance program will involve removal of trash, weed control, fence repair, and any remedial measures deemed necessary for the success of the restoration program (e.g., re-seeding, re-contouring).

Particular emphasis will be placed on pro-active weed control. All weeding within and immediately adjacent to the vernal pools will be by hand. Weeds in the upland areas will be removed by hand whenever possible. Focused herbicide application also will be used to control weeds in the upland area. Herbicides should not be used during wet or windy conditions. Care should be taken not to saturate the soils with herbicide. No herbicide will be used within or adjacent to the restored and preserved vernal pools. Mechanical removal of weed species with a line trimmer or other such device in the upland areas also may be necessary. All exotic species in the vernal pool and upland areas will be targeted for removal. Weed species of major concern on site include but are not limited to filaree, star thistle, Italian ryegrass, rabbitsfoot grass, fennel, and curly dock. Success criteria for weeds is presented in Section V.D. Hydrologic conditions will be modified if necessary to assure prolonged periods of inundation to help control exotic species. Pools that hold water longer generally have fewer invasive species.

B. HABITAT MAINTENANCE SCHEDULE

Regular maintenance, trash removal, and weed control will be conducted during the first five years following implementation of the mitigation program or until the mitigation program is deemed successful. Maintenance personnel will visit the site at least monthly for the five-year maintenance and monitoring period. Additional visits will be conducted as directed by the restoration specialist during the rainy season (generally December through May) each year to keep weeds under control.

C. ARTIFICIAL BURROW MAINTENANCE

Maintenance personnel shall be educated as to the sensitivity of burrowing owls and the goals of the artificial burrow maintenance program. Maintenance tasks shall be performed only at the direction of the specialist for a five-year period following burrow construction. Sites have been selected and designed to ensure that the need for maintenance will decrease each year of the five years. The specialist may direct maintenance personnel to avoid burrows by providing a minimum 50-meter, non-maintenance buffer should owls occupy burrows.

Maintenance tasks could include vegetation management around each burrow, repair of burrows damaged by vandalism, and installation of signs prohibiting trespassing in sensitive habitat areas (that is, where burrows are located).

Vegetation management could include mowing or weed whacking a 50-foot radius around each burrow, although the burrow locations have been designed with gravel placement, soil compaction, and seeding with low-growing plant species to limit the need for this type of maintenance. Vegetation management could also include reseeding around the burrows with the low-growing plant species listed earlier in this document, or other species, if deemed necessary by the specialist.

Damage to burrows could be caused accidentally (such as by maintenance equipment or humans trespassing) or by vandalism. Damage could include collapse or blockage of burrow entrances or vegetation alteration around burrows. Damaged burrows and vegetation surrounding the burrows should be repaired to their pre-damaged condition within one week of the damage being observed. In a worst-case scenario, damage repair could include reconstructing part of a burrow, recompacting soil, and reseeding. The burrows will be designed and installed to limit the potential risk of collapse by making use of heavy materials and extending the burrow entrances well beyond the soil horizon.

During the periods February 1 through April 14 and July 16 through November 30 in years 2 through 5, maintenance personnel shall inspect burrow locations once per month with binoculars from a distance of no less than 50 meters for possible maintenance concerns. If maintenance is necessary, maintenance personnel shall first contact the specialist for direction. The specialist shall determine whether or not burrows to be maintained are occupied by owls prior to initiation of maintenance activities and the relative risks of disturbance.

VIII. MONITORING PLAN

A. MONITORING METHODS

Monitoring will be carried out under the direction of the restoration specialist to assess the progress of the restoration effort and determine any appropriate remedial measures. Quantitative success criteria presented above (Section V) will be used to measure the success of the mitigation. Final and yearly success criteria are included to measure interim and ultimate habitat development. If the annual goals are not being met, corrective measures will be implemented. Corrective measures may include but are not limited to importing new soil inoculum from an off-site source, recontouring of non-functioning pools, and re-seeding with collected or commercially available seeds from the immediate area. Prior to conducting any remedial measures outside the scope of this plan, the regulatory agencies will be notified.

1. Vernal Pools

Monthly inspections of the restoration and maintenance efforts will be performed during Year 1, every other month during Year 2, and every three months during the remainder of the monitoring period.

In addition, bi-monthly monitoring visits will be conducted during the rainy season of each year to monitor pool hydrology and conduct wet season fairy shrimp surveys. During each of these visits depth, extent, and duration of inundation of all pools (mitigation and control) will be measured. Depth measurements will be taken following the onset of winter rains and will continue until May 15th or until all pools are dry. Plant and animal species observed in each pool during the monitoring visits also will be recorded.

The purpose of the fairy shrimp surveys is to determine the presence/absence of the San Diego and Riverside fairy shrimp in the mitigation pools. The presence of other faunal species occupying the pools also will be noted during the surveys. The results of the fairy shrimp surveys will be included in the annual monitoring reports.

An annual monitoring visit will be conducted each year near the end of the rainy season when most vernal pool species are visible. The exact timing of annual monitoring will be dependent upon the time and amount of rainfall received each year. Monitoring will use standard techniques and be based on transect/quadrat sampling. Permanent transects will be established from pool edge to pool edge through the deepest portion of each pool. Each transect will be marked with rebar stakes at both ends and labeled with caps indicating the pool number. Decimeter quadrats will be measured at regular intervals along each transect. All plant species present within each quadrat will be noted and an abundance/density index will be assigned to each species. This index assigns values from 1 to 4, based on the number of quarters of the quadrat in which the plant species occurs. Frequency will be determined by the number of quarters a species occurs in relative to the number of quarters for all quadrats along the transect.

A point-frame sampler with a double thread layer forming a grid will be used to determine cover in each quadrat. At each of the 25 nodes of the grid underlying cover type will be recorded: plant species, plant litter, rock, or bare ground (multiple species can be recorded at a single point if they occupy different levels under a given node). Each plant will be identified as being either native or non-native. The plants will be further classified into vernal pool indicators, wetland associated plants, and upland plants. The collected data will be used to determine species richness, and total and relative vegetative cover (refer to Sections V.B and V.C) within each quadrat.

Photo documentation points shall be established for the preserve area, and photographs will be taken of each pool during the annual monitoring event. Representative photos will be provided in the annual monitoring report.

2. Upland Habitat

The status of the upland revegetation area will be noted during each monitoring visit throughout the year. Overall health and vigor of the upland habitat will be qualitatively recorded as well as the amount of weeds present. Species cover and richness will be visually estimated. All plants observed will be categorized by origin (native/non-native) and stratum (herb, shrub, tree). Photographs will be taken each year from the same location to monitor change over time.

3. Artificial Burrows

Monitoring of the artificial burrows shall be carried out by a qualified biologist and shall include the following observations: presence of owls and other burrowing animals, burrow use, general available prey base, vegetation condition (in particular height) around burrows, other predatory animal species that could prey on burrowing owls and/or compete with them for food, and any maintenance concerns as described above.

Monitoring shall occur for five years according to the schedule below. The majority of visits occur during the breeding (April 15 through July 15) and wintering seasons (December 1 through January 31) of burrowing owls. This schedule is designed under the assumption that monitoring will begin following artificial burrow construction and prior to initiation of grading on site. The specialist shall have reasonable flexibility to alter the exact timing of monitoring events in response to on-site observations/conditions.

Monitoring will occur according to the following schedule:

- Year 1 (12 monitoring events; one monitoring event per month).
- Years 2 through 5 (8 monitoring events per year as follows: December 1 through January 31 – three, logically spaced monitoring events; February 1 through April 14 – one monitoring event; April 15 through July 15 – three, logically spaced monitoring events; and July 16 through November 30 – one monitoring event.

B. ANNUAL REPORTS

As part of the monitoring program, annual reports prepared by HELIX will be submitted to the City, Corps, CDFG, and USFWS evaluating the success of the vernal pool mitigation effort to date, along with any recommendations for future work that may be deemed necessary. Annual reports prepared by HELIX will be submitted to the City, USFWS, and CDFG evaluating the success of the burrowing owl translocation effort to date. Each annual monitoring report will include data collected throughout the year in addition to the annual monitoring visit. Annual monitoring reports will provide comparisons of the annual monitoring data to the control site for that year. To detect the overall trend of the site, the annual monitoring report will contain comparisons of the monitoring data for the years that data are collected.

C. REMEDIAL MEASURES

If the annual goals are not being met, corrective measures will be implemented. Corrective measures may include, but are not limited to, importing new inoculum from an off-site source, recontouring of non-functioning pools and re-seeding with collected or commercially available seed. For example, if a pool does not pond water sufficiently it will be deepened, recontoured and recompacted during the dry season. Pools exhibiting appropriate hydrological characteristics but low species cover and richness will be re-seeded with vernal pool plant species. Prior to conducting any significant remedial measures, the regulating agencies will be notified.

D. SCHEDULE

As described above, monthly inspections of the restoration and maintenance effort will be performed during Year 1, every other month during Year 2, and every three months for the remainder of the monitoring period. Monitoring events that focus on botanical data collection (i.e., percent cover, density, phenology, etc.) will occur annually for five years. Reports will be prepared and submitted to the City, Corps, CDFG, and USFWS by September of each year to ensure adequate time remaining in the dry season to make any necessary alterations to the preserve areas.

IX. COMPLETION OF MITIGATION

A. NOTIFICATION OF COMPLETION

The permittee shall notify the USFWS, Corps, CDFG, and City of completion of the mitigation effort through the submittal of the final (Year 5) monitoring report. The final monitoring report will include a jurisdictional delineation of the mitigation areas. This delineation must show that the goals of the mitigation program (as described in Section III) have been met.

B. AGENCY CONFIRMATION

After receipt of the final monitoring report, the USFWS, Corps, CDFG, and City may inspect the mitigation site to determine the success of the project. After evaluating the final report the agencies shall determine if the restoration effort is acceptable.

C. LONG-TERM MANAGEMENT

The vernal pool mitigation areas will be turned over in fee-title to a non-profit organization dedicated to the preservation of sensitive lands. Long-term management of the vernal pool mitigation areas will be the responsibility of the organization accepting the fee-title. As of the writing of this report no entity has been chosen to accept long-term responsibility of the restoration areas.

X. CONTINGENCY MEASURES

A. INITIATING PROCEDURES

If the Corps, CDFG, USFWS, and City determine upon receipt of any of the annual monitoring reports that the restoration effort is not meeting success standards for the project, the Corps, CDFG, USFWS, and City shall notify the permittee in writing that the restoration effort may require augmentation for successful implementation. The permittee shall have 30 days to respond to the notification. During this period, the permittee may discuss alternatives to the suggestions of the regulating agencies.

B. FUNDING MECHANISM

The permittee (Section IV.B) shall be responsible for all costs associated with any remedial measures.

C. RESPONSIBLE PARTIES

The permittee shall be the responsible party for any remedial measures.

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Phone (619) 220-4969 Fax (619) 220-7029
www.schwerin-assoc.com

June 8, 2015

To Whom it May Concern:

The City of San Diego's Transportation Department during its review of the EIR, discovered that the traffic calculations for the Traffic Impact Analysis used "greater than 20 dwelling units per acre" as a basis its calculations; while the Tentative Map used 19.93 (rounded up to 20) dwelling units per acre.

In order for the traffic calculations in the Traffic Impact Analysis report to be accurate and match the EIR, the dwelling units per acre must be "greater than" 20.

Therefore, the Tentative Map was updated to reflect a decrease of .09 acres for the developable acres (Lot 1 was decreased by .09 acres and Lot 4 (MHPA) increased). This increased the dwelling units per acre to 20.008 and required the following changes to the Tentative Map:

Area affected	Previous Tentative Map acres/units	Updated Tentative Map acres/units
Lot 1 acres	7.81 acres	7.72 acres
Dwelling unit per acre	19.93 dwelling units per acre	20.008 dwelling units per acre
Developable acres	23.83 acres	23.74 acres
Lot 4 acres	15.76 acres	15.85 acres
Total open space acres	17.86 acres	17.95 acres
Total open space rounded	17.9 acres	18 acres
Total developable acres rounded	23.8 acres	23.7 acres

This update to the Tentative Map made the environmental impact LESS than previously stated. Therefore, it was determined that the reports for this EIR would not need to be re-written/updated to reflect this negligible change of .09 acres on the Tentative Map.

Also note, some reports state that 476 dwelling units would be built and others studied impacts of 475 units. Therefore, 475 dwelling units will be used to be consistent. Some reports may show 476 units. The lower dwelling unit number would cause LESS of an environmental impact.

The attached report may have acres/units which do not reflect the latest Tentative Map updates described above. However, please note the current impact is less that the report may state and therefore, not considered a significant change requiring a report re-write.

Sincerely,

Kathy C

Kathy Corvin
Schwerin & Assoc.
(619) 220 4969

Appendix Q

On-Site Habitat Management Plan
Alden Environmental, July 2013
HELIX Environmental Planning, Inc., August 2008
~~May 2006~~

ALDEN ENVIRONMENTAL, INC
3245 University Ave, #1188 | San Diego, CA 92104 | Phone/Fax: 619.284.3815

Candlelight Project (LDR 40329)
Habitat Management Plan Changes
July 2, 2013

The attached On-Site Habitat Management Plan (HMP), dated August 5, 2008, was written for the Candlelight Villas East and West project (LDR 40329). The project applicant at the time was Western Pacific Housing-D.R. Horton. The project name and applicant have since changed. In addition, the project currently being processed through the City is smaller than that covered by the restoration plan and the Biological Opinion (BO) issued for the project by the U.S. Fish & Wildlife Service. The previous project included impacts associated with the “panhandle” parcel (APN 645-061-0500) that extends to the south. While the current project is smaller than the previous submittal, the vernal pool plan and the BO still assess impacts and provide required mitigation for the larger area, including the panhandle. A future application may be submitted for this parcel, the impacts of which also would be mitigated as described in the vernal pool plan.

While there have been changes in the project design and applicant, the essential components of the on-site vernal pool restoration plan remain unchanged. The following text provides updates to the text in the HMP as necessary to reflect the current project being processed through the City.

Project Applicant/Responsible Party (HMP Section 3.2.1)

Project Title: Candlelight Project

Report Title: On-Site Habitat Management Plan

Applicant: Candlelight, LLC

City Number: 40329

Burrowing Owls (HMP Section 5.0)

Section 5 of the HMP identified impacts to burrowing owl habitat resulting from the Candlelight project. Additional surveys have been conducted since the HMP was written and, based on the results of the new fieldwork and the current CDFW Staff Report on Burrowing Owl Mitigation (March 7, 2012), impacts to burrowing owls are not being assessed for the project. This is discussed in more detail in Sections 2.2.4, 4.3.1, and 5.1.6 of the Candlelight Biological Technical Report. References to burrowing owl impacts and associated mitigation measures in the HMP are no longer valid. However, the project will still install the artificial burrows and carry out the long term management identified in the HMP.

The remainder of the HMP accurately reflects the long term management measures to be carried out.

Greg Mason
Principal/Senior Biologist

Candlelight Villas East and West

ON-SITE HABITAT MANAGEMENT PLAN
LDR No. 40329

~~February 2, 2007~~
August 5, 2008

Prepared for:

Western Pacific Housing-D.R. Horton
5790 Fleet Street, Suite 210
Carlsbad, California 92008

Prepared by:

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard, Suite 200
La Mesa, California 91941

Greg Mason
Project Manager and
Vice President

Candlelight Villas East and West
On-site Habitat Management Plan

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1.0 INTRODUCTION

This Habitat Management Plan (HMP) has been prepared for the preserved open space areas (preserve areas) on the Candlelight Villas East project site for the Candlelight Villas East and potential future Candlelight Villas West projects in accordance with requirements identified in their respective Environmental Impact Reports (T&B Planning [T&B] 2006 and T&B in progress, respectively).

This HMP addresses applicable management guidelines for the City of San Diego's (City) Multi-Habitat Planning Area (MHPA) and adjacent sites (City 1997a and 1997b). This HMP details the mitigation and management measures necessary to comply with federal and state Endangered Species acts (ESAs), Natural Communities Conservation Planning Act (NCCP), and permits and agreements with the U.S. Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (Corps), California Department of Fish and Game (CDFG), and State Water Resources Control Board, San Diego Region (SWRCB; collectively, the resource agencies).

The main purpose of this HMP is to identify methods and means necessary to maintain and enhance habitat (and related wildlife) values of the preserve areas in perpetuity. The HMP provides framework for long-term management of the preserve areas. It defines methods and schedules to sustain habitat function and value following restoration, determines the parties responsible for management, and identifies associated costs and source of funding. The ultimate goal of this HMP is to preserve long-term viability and function and value of native habitats on site along with the listed and sensitive species they support. Achieving this goal also would benefit and improve the quality of life for local residents through preservation and enhancement of a more diverse and balanced environment.

For information on biological conditions existing prior to development, please refer to the biological technical reports for Candlelight Villas East (HELIX 2007) and Candlelight Villas West (HELIX 2004).

2.0 PRESERVE AREA DESCRIPTION

The project sites are located in the City's Otay Mesa community 1.1 miles east of Interstate 805, 1.4 miles north of the U.S./Mexico border, and south of Otay Mesa Road (Figures 1 and 2). The preserve areas consist of a western preserve and an eastern preserve located on each end of the project site (Figure 3).

Combined, the preserve areas encompass approximately 17.56 acres and would be deeded to a habitat management entity approved by the wildlife agencies, placed under open space easements with the wildlife agencies named as third party beneficiaries. The 15.48-acre western preserve area is bounded on the north by the Sweetwater Union High School District vernal pool restoration site and San Ysidro High School (Figures 3 and 4). The 2.08-acre eastern preserve is located at the east end of the Candlelight Villas East site (Figure 4). The 15.48-acre western preserve consists of vernal pool mitigation for both the Candlelight Villas East and Candlelight Villas West projects (Figure 5).

SENSITIVE RESOURCES WITHIN THE PRESERVE AREAS

Vegetation

Three sensitive vegetation communities occur within the preserve areas: vernal pools, maritime succulent scrub, and non-native grassland (Table 1; Figures 4 and 5). Disturbed habitat also occurs within the preserve areas.

Table 1
VEGETATION COMMUNITIES WITHIN THE PRESERVE AREAS (acre[s])*

Vegetation Community	Western Preserve†	Eastern Preserve	Total
Vernal pool‡	1.28	0.08	1.36
Maritime succulent scrub**	13.93	0.60	14.53
Non-native grassland	-	1.10	1.10
Disturbed habitat	0.27	0.30	0.57
TOTAL	**15.48**	**2.08**	**17.56**

*Upland habitats are rounded to the nearest 0.1 acre, while wetland habitats are rounded to the nearest 0.01; thus, totals reflect rounding
†Includes vernal pool restoration for Candlelight Villas East and West projects
‡Restored, preserved, and enhanced vernal pool basins
**Maritime succulent scrub preservation of 1.1 acres MHPA and restoration

Plant Species

A total of 121 plant species were observed within the project sites prior to development (Appendix A). Five sensitive plant species occur within the preserve areas: San Diego bur-sage (*Ambrosia chenopodiifolia*), San Diego barrel cactus (*Ferocactus viridescens*), southcoast saltscale (*Atriplex pacifica*), cliff spurge (*Euphorbia misera*), and San Diego sunflower (*Viguiera laciniata*). None of these plant species is federally listed or City Narrow Endemic; however, all are considered sensitive by the California Native Plant Society (CNPS; 2006). The following text provides brief descriptions of each species, its status within the preserve areas, and (if applicable) Multiple Species Conservation Program (MSCP) management requirements (see Appendix C for a listing and explanation of status and sensitivity codes).

San Diego bur-sage (*Ambrosia chenopodiifolia*)
Listing: --/--; CNPS List 2.1
Distribution: Southwestern San Diego County, Arizona, and Mexico below 600 feet in elevation
Habitat: Dry, sunny hillsides in coastal sage scrub and maritime succulent scrub
Project site/open space status: Scattered individuals were observed in maritime succulent scrub
MSCP management requirements: No management directives for this species

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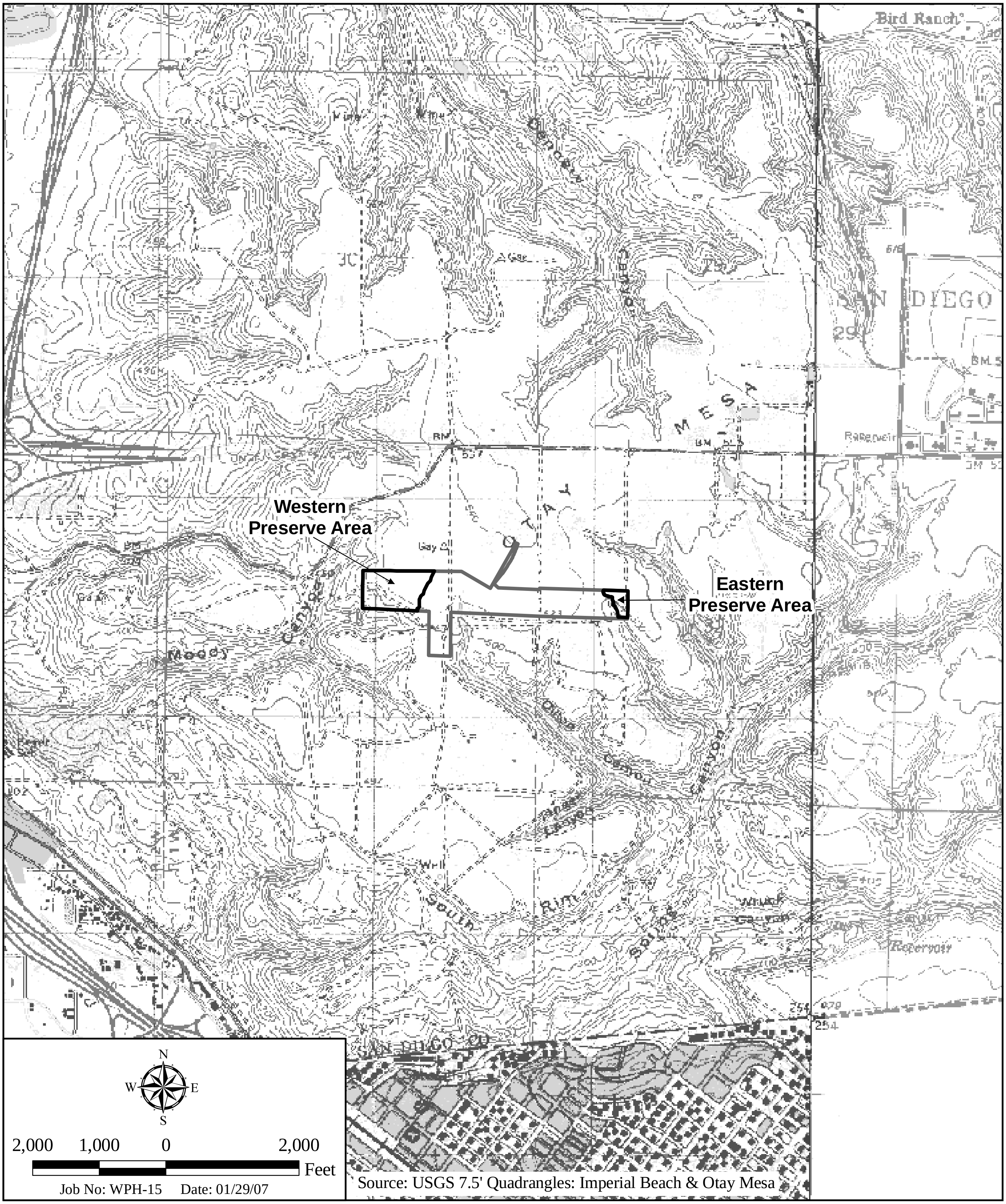
Regional Location Map

HABITAT MANAGEMENT PLAN FOR CANDLELIGHT VILLAS EAST AND WEST

HELIX

Figure 1



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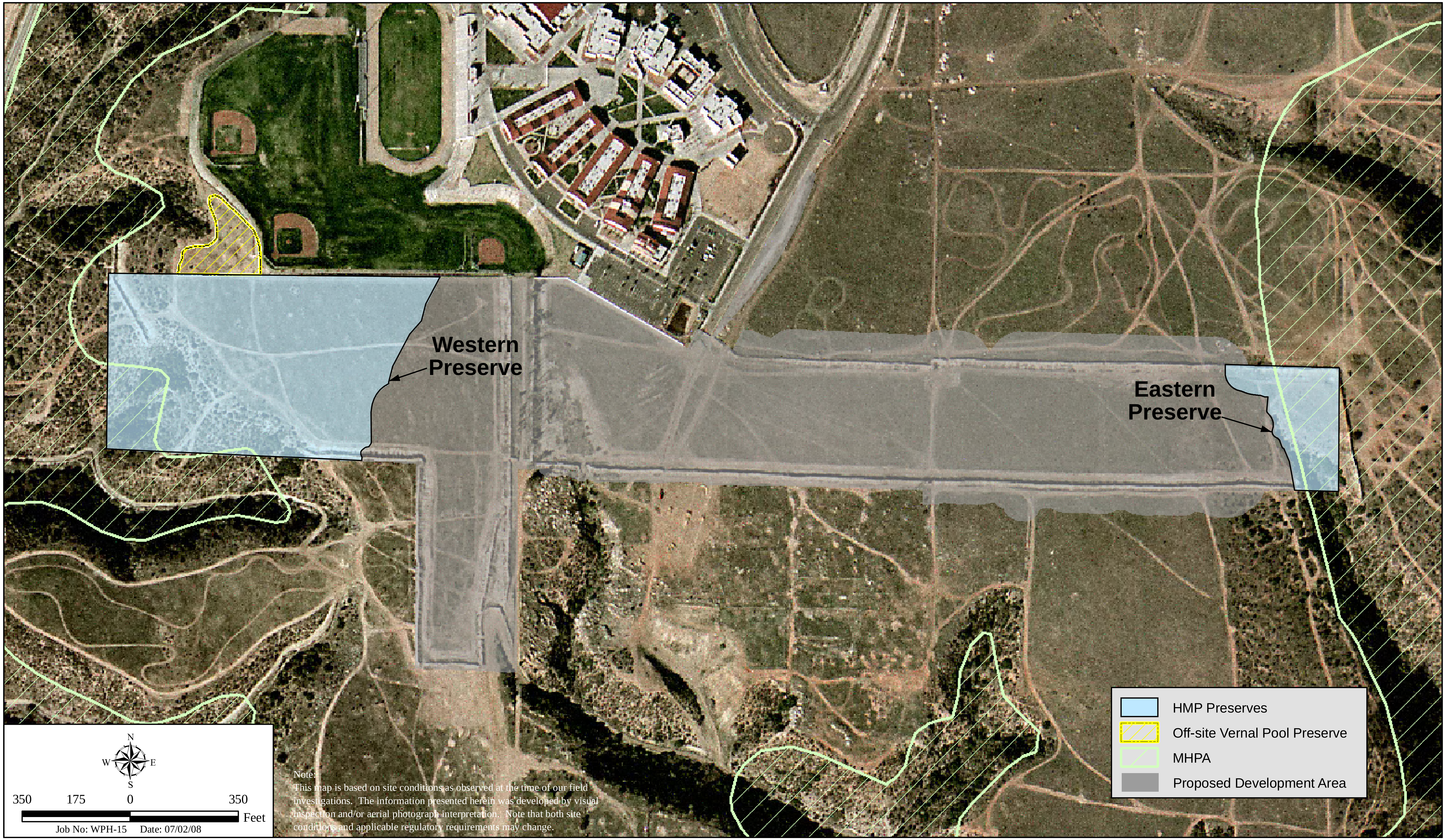
Project Location Map

HABITAT MANAGEMENT PLAN FOR CANDLELIGHT VILLAS EAST AND WEST

HELIX

Figure 2



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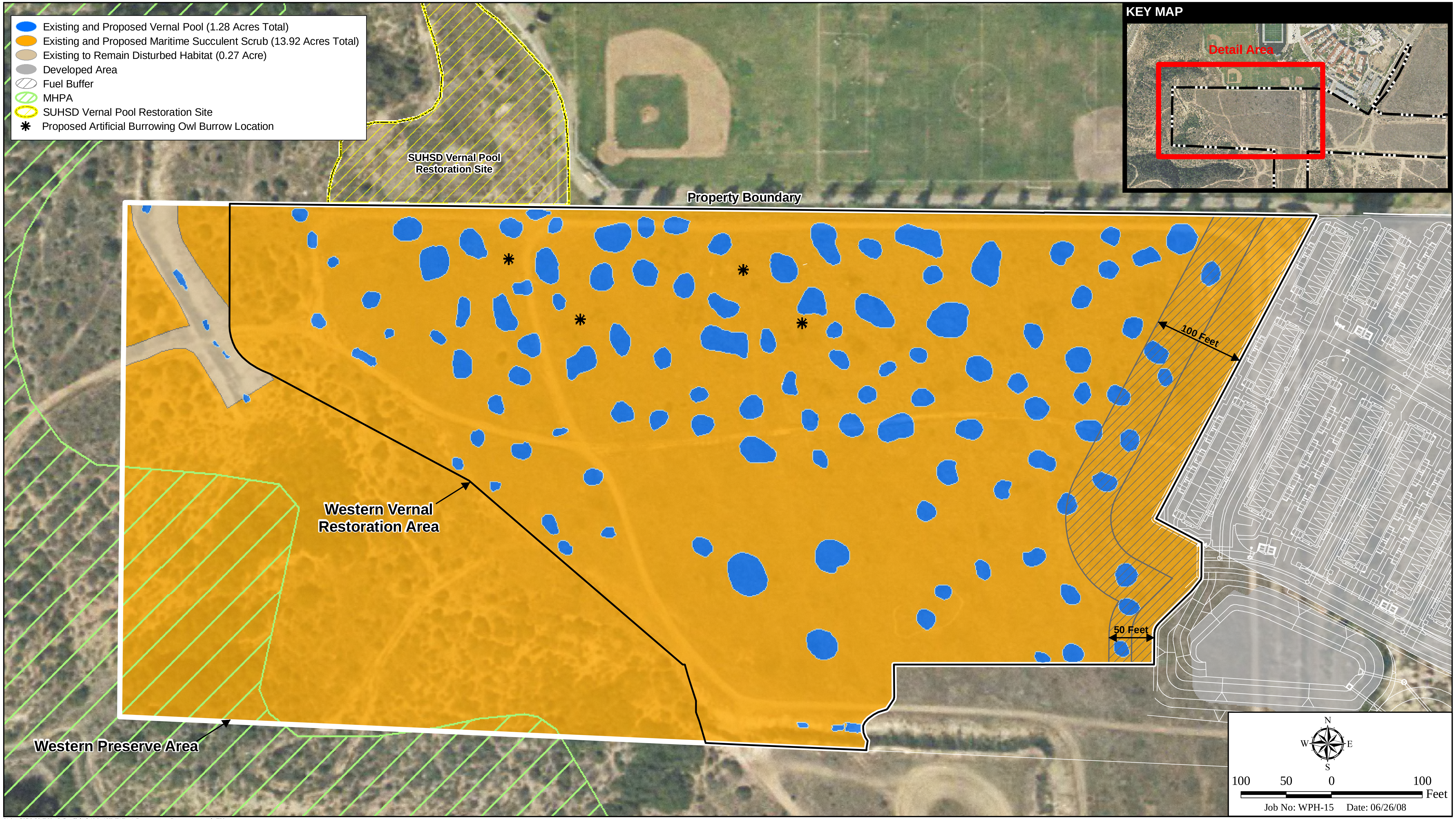
Candlelight Preserves Project Elements

HABITAT MANAGEMENT PLAN FOR CANDLELIGHT VILLAS EAST AND WEST

Figure 3

HELIX



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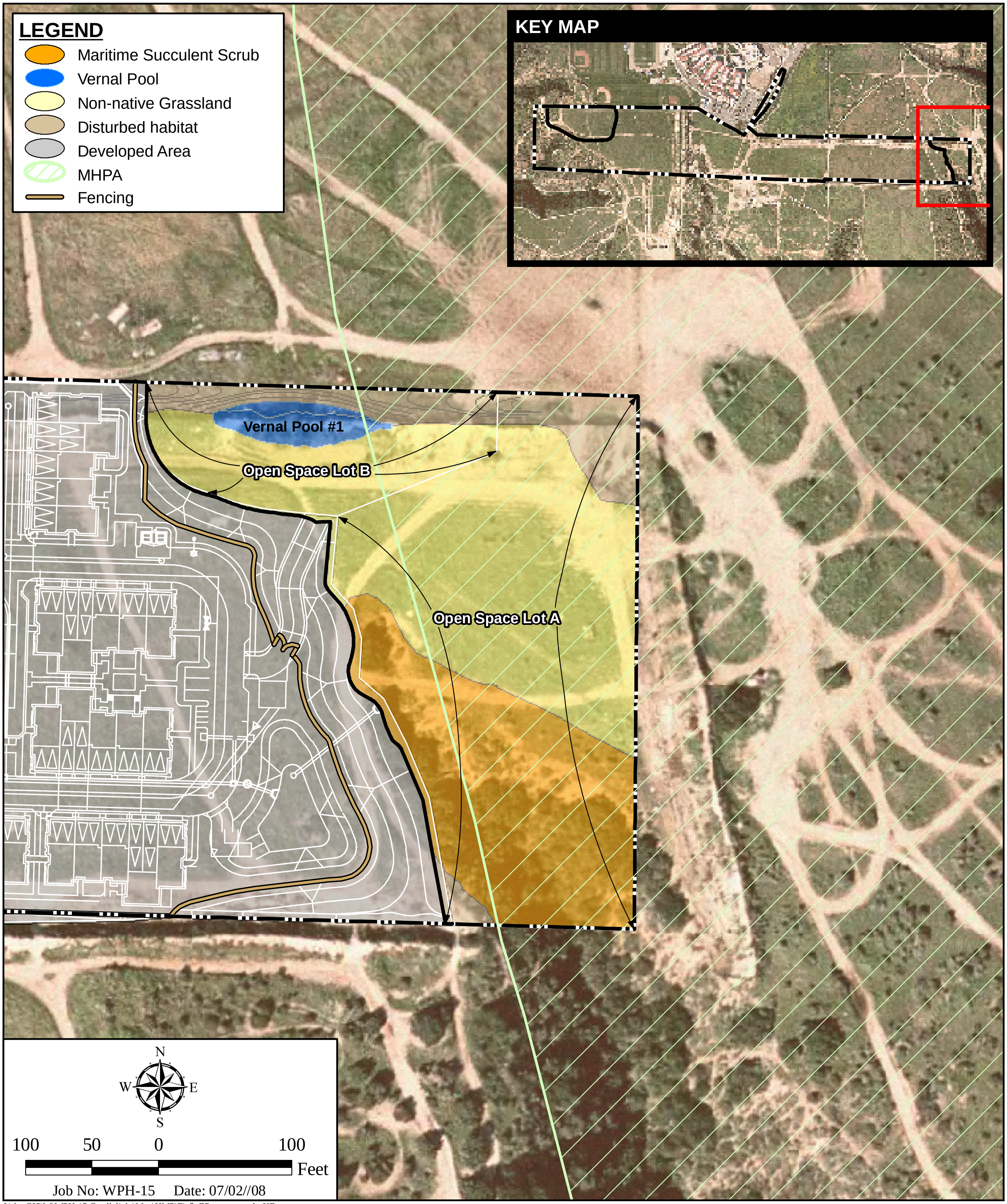
Western Preserve

HABITAT MANAGEMENT PLAN FOR CANDLELIGHT VILLAS EAST AND WEST

HELIX

Figure 4



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Eastern Preserve

HABITAT MANAGEMENT PLAN FOR CANDLELIGHT VILLAS EAST AND WEST

HELIX

Figure 5

Southcoast saltscale (*Atriplex pacifica*)
Listing: --/--; CNPS List 1B.2
Distribution: San Diego, Orange, Los Angeles, and Ventura counties; Channel Islands; Baja California (Baja) and Sonora, Mexico
Habitat: Grows in xeric and often mildly disturbed locales and Diegan coastal sage scrub
Project site/open space status: Individuals were observed within the maritime succulent scrub in Moody Canyon within the MHPA in the southwestern corner of the open space
MSCP management requirements: No management directives for this species

Cliff spurge (*Euphorbia misera*)
Listing: --/--; CNPS List 2.2
Distribution: Coastal range extends from Corona Del Mar to Baja. In San Diego County, known from Carlsbad, Point Loma, San Diego, Sweetwater Valley, and Otay Mesa. Also occurs across the border in the Tijuana Hills (Beauchamp 1986).
Habitat: Occurs on rocky soils in maritime succulent scrub, coastal sage scrub, and coastal bluff scrub
Project site/open space status: Found in maritime succulent scrub
MSCP management requirements: No management directives for this species

San Diego barrel cactus (*Ferocactus viridescens*)
Listing: --/--; CNPS List 2.1
Distribution: San Diego County and Baja
Habitat: Dry slopes in sage scrub
Project site/open space status: Individuals scattered in maritime succulent scrub at westernmost end of the open space.
MSCP management requirements: Management directive must include measures to protect this species from edge effects, unauthorized collection, and appropriate fire management/control practices to protect against a too frequent fire cycle

San Diego sunflower (*Viguiera laciniata*)
Listing: --/--; CNPS List 4.2
Distribution: Shrub known from southern coastal and foothill San Diego County and Baja. Reported localities in San Diego County include San Onofre, Bonsall, Mission Hills, Mission Valley, Spring Valley, La Mesa, and Otay Lake (Beauchamp 1986).
Habitat: Open coastal sage scrub and maritime succulent scrub on a variety of soil types
Project site/open space status: Subdominant species found in maritime succulent scrub
MSCP management requirements: No management directives for this species

Animal Species

A total of 61 animal species were observed or detected within the project sites prior to development (Appendix B), of which 13 are considered sensitive animal species and 8 that occur (or may occur following mitigation) within the preserve areas: federally listed endangered San Diego fairy shrimp (*Branchinecta sandiegonensis*) and Riverside fairy shrimp (*Streptocephalus woottoni*); federally listed threatened coastal California gnatcatcher (*Polioptila californica californica*); and California species of special concern western spadefoot (*Spea hammondii*), orange-throated whiptail (*Cnemidophorus hyperythrus beldingi*), southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), burrowing owl (*Athene cunicularia*), and San Diego black-tailed jackrabbit (*Lepus californicus bennettii*). The following text provides brief descriptions of each species, its status within the preserve areas, and (if applicable) MSCP management requirements.

San Diego fairy shrimp (*Branchinecta sandiegonensis*)
Listing: FE/--
Distribution: San Diego County
Habitat: Seasonally astatic pools that occur in tectonic swales or earth slump basins and other areas of shallow, standing water, often in patches of grassland and agriculture interspersed in coastal sage scrub and chaparral
Project site/open space status: Occurs within Vernal Pool 1 in the eastern portion of the open space and within 1 vernal pool in the western portion of the open space
MSCP management requirements: Area-specific management directives must include specific measures to protect against detrimental edge effects to this species from surrounding development

Riverside fairy shrimp (*Streptocephalus woottoni*)
Listing: FE/--
Distribution: Riverside, Orange, and San Diego counties; northern Baja
Habitat: Vernal pools and other ephemeral pools of at least 6 to 12 inches deep
Project site/open space status: Occurs within Road Pool 12, which is not located within the open space. The vernal pools in the northwestern potion of the preserve were created to support this species.
MSCP management requirements: Area-specific management directives must include specific measures to protect against detrimental edge effects to this species from surrounding development

Western spadefoot (*Spea hammondii*)
Listing: --/SSC
Distribution: Northern California into northern Baja
Habitat: Breeds in vernal pools and may be found within burrows within coastal sage scrub or maritime succulent scrub habitats
Project site/open space status: Found in many of the water-holding basins
MSCP management requirements: No management directives for this species

Orange-throated whiptail (*Cnemidophorus hyperythrus beldingi*)
Listing: --/SSC
Distribution: Southern Orange and southern San Bernardino (Colton) counties south to the cape of Baja
Habitat: Coastal sage scrub, chaparral, edges of riparian woodlands, and washes. Also found in weedy, disturbed areas adjacent to these habitats. Important habitat requirements include open, sunny, and shaded areas with abundant invertebrate prey base, particularly termites (*Reticulitermes* sp.).
Project site/open space status: Present in the canyon area in the eastern portion of the open space and within maritime succulent scrub in the western portion of the open space
MSCP management requirements: Area-specific management directives must address edge effects

Coastal California gnatcatcher (*Polioptila californica californica*)
Listing: FT/SSC
Distribution: Southern Los Angeles, Orange, western Riverside, and San Diego counties south into Baja
Habitat: Coastal sage scrub
Project site/open space status: One individual heard during second protocol survey in eastern maritime succulent scrub canyon approximately 100 feet off site; 2 individuals observed within Moody Canyon
MSCP management requirements: Area-specific management directives must include measures to reduce edge effects and minimize disturbance during the nesting period; fire protection measures to reduce potential for habitat degradation due to unplanned fire; and management measures to maintain or improve habitat quality, including vegetation structure. No clearing of occupied habitat within the MHPA may occur between March 1 and August 15.

Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)
Listing: --/WL
Distribution: Ventura County southeast through Los Angeles, Orange, Riverside, and San Diego counties to northwestern Baja
Habitat: Coastal sage scrub, where it occurs on rocky hillsides and in canyons but may be found in open sage scrub/grassy areas of successional growth (e.g., after a fire)
Project site/open space status: A single bird observed within maritime succulent scrub understory in Moody Canyon within the MHPA in the southwestern corner of the open space
MSCP management requirements: Management directive must include maintenance of dynamic process (such as fire) to perpetuate some open space phases of coastal sage scrub (or maritime succulent scrub) with herbaceous components

Burrowing owl (*Athene cunicularia*)
Listing: --/SSC
Distribution: Lower British Columbia to Manitoba, Canada; central and western U.S. south to northern Mexico and Baja
Habitat: Generally restricted to grasslands and agricultural lands. It uses burrows of California ground squirrel (*Spermophilus beecheyi*) for nest sites.
Project site/open space status: Owl pellet and evidence of occupied burrow found at the northeastern edge of the site during the 2004 summer rare plant survey. Owl observed during an on-site meeting in October 2004.
MSCP management requirements: Include enhancement of known, historical, and potential burrowing owl habitat and management of ground squirrels. Enhancement measures may include creation of artificial burrows and vegetation management to enhance foraging habitat. Management shall include monitoring burrowing owl nest sites to determine use and nesting success, predator control, and establishing a 300-foot-wide impact avoidance area (within the preserve) around occupied burrows.

San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)
Listing: --/SSC
Distribution: Southern Santa Barbara County south (on coastal slope) to vicinity of San Quintin, Baja. Localities on eastern edge of its range include Jacumba and San Felipe Valley in San Diego County.
Habitat: Occurs primarily in open habitats, including coastal sage scrub, chaparral, grasslands, croplands, and open disturbed areas if there is at least some scrub cover present
Project site/open space status: Observed in maritime succulent scrub
MSCP management requirements: No management directives for this species

3.0 RESPONSIBLE PARTIES

3.1 ADMINISTRATION

An individual or organization acceptable to the project proponent and resource agencies shall be contracted to serve as Habitat Manager. If the entity hired is an organization, the person(s) actively managing the open space must satisfy criteria for a Habitat Manager (as described below), and a Project Manager must be designated.

The City shall designate one of its staff members as the HMP Administrator. The Habitat Manager (or Project Manager, if applicable) shall report directly to the HMP Administrator on all issues, concerns, and questions, unless otherwise directed in writing by the HMP Administrator. The USFWS and CDFG will serve in an advisory capacity to the City regarding resource values and issues within the preserve areas.

3.2 RESPONSIBILITY

3.2.1 Project Proponent

Project proponent Western Pacific Housing is 100 percent responsible for funding the implementation of this HMP, including management/maintenance of the preserve areas in perpetuity via a one-time endowment to fund long-term HMP implementation. No start-up tasks will be required, given that information used to finalize the restoration plan can be used as start-up information. Long-term HMP tasks involve activities associated with the management and maintenance of the preserve areas in perpetuity, including habitat monitoring/mapping, exotic species control, public awareness programs, and general monitoring and reporting. Additional descriptions of all these long-term efforts are provided below in Section 6.0. The endowment would be non-wasting (i.e., annual interest would be sufficient to cover yearly management needs) and would fund management activities in perpetuity. In addition, the proposed endowment amount would require approval by the City and/or entity accepting title/management responsibilities for the HMP lands.

The project proponent shall complete the following requirements under direction of the City and/or Habitat Manager, as appropriate:

- Contract with a Habitat Manager approved by the City and resource agencies.

- Supply the Habitat Manager with digital and hard copies of all reports prepared for the project area, as appropriate (i.e., reports containing sensitive resource data, such as this HMP).

- Convey all open space areas (as previously described) to the City or other designated entity via fee title and/or open space easement.

3.2.2 Habitat Manager

As previously stated, the City and project proponent shall jointly approve the selection of a Habitat Manager. The Habitat Manager shall posses the following qualifications:

- A B.S. or B.A. degree in wildlife management, natural resources, ecology, zoology, botany, biology, or similar degree.

- A minimum of 2 years experience in field biology in southern California (preferably San Diego County).

- Demonstrated experience in similar projects, or in projects requiring similar skills.

- Experience in working with community groups.

The Habitat Manager (1) will be responsible for the implementation of this HMP; and (2) will carry out the HMP's requirements and objectives. The Habitat Manager's primary responsibility will be to maintain the integrity of all preserved and restored habitats. In order to fulfill that responsibility, the Habitat Manager shall:

- Be an advocate of the preserved open space and its protection.
- Be familiar with this HMP, its appendices, and supporting documentation.
- Be responsible for all points noted in this HMP as being within his/her responsibility or judgment, as discussed in applicable sections of this document.
- Maintain all documents transferred by the project proponent (as previously noted), and be knowledgeable about the resources addressed in these reports.
- Educate the surrounding community about the presence and need for the open space and be responsive to any community concerns or problems regarding the open space.
- Provide direction to the community on the importance and maintenance of open space.
- Document all field visits, and notify the City in a timely manner of all concerns, problems, and suggested solutions. Forward all applicable monitoring and management data to the City for incorporation into the MSCP database.
- Coordinate with the manager(s) of adjacent preserves (i.e., MHPA) on management practices and tasks related to preservation and maintenance of the subregional open space system and apply pertinent adaptive management recommendations received from the regional monitoring source. Specifically, this will include activities such as the removal of exotic and pest species, and ensuring compatibility with the overall open space management plan proposed as part of the MSCP Subarea Plan.

4.0 FUNDING MECHANISM

The project applicant will be responsible for all HMP funding requirements. Specifically, this would include a one-time endowment to fund long-term HMP implementation. The estimated cost for implementation of the HMP is provided in the Property Analysis Record (PAR) prepared for this project (Appendix D). Long-term HMP tasks involve activities associated with the management and maintenance of the preserve in perpetuity, as funding permits, including habitat monitoring/mapping, exotic species control, public involvement programs, and general monitoring and reporting (See Section 6.0). The PAR includes funding necessary to ensure long-term management in perpetuity, including contingency funds to address restoration efforts that may be required after a catastrophic fire. The endowment amount would be required to meet the estimated costs identified in the PAR. In addition, the proposed endowment amount would require approval by the chosen Habitat Manager.

5.0 VERNAL POOL RESTORATION/ ARTIFICIAL BURROWING OWL BURROW CREATION

Prior to implementation of this HMP, the project proponent will implement restoration activities for vernal pools and their associated watersheds to mitigate for impacts to vernal pools, road pools supporting listed fairy shrimp, disturbed wetlands, and non-wetland Waters of the U.S./Streambed. The On-site Vernal Pool Restoration Plan (HELIX 2008) for the project includes vernal pool and maritime succulent scrub habitat restoration in the western preserve and vernal pool preservation and enhancement in the eastern preserve. In addition, the On-site Vernal Pool Restoration Plan includes a component to mitigate for impacts to burrowing owl, which consist of installation of 6 artificial burrows. This HMP will not take effect within the vernal pool restoration areas until the five-year maintenance and monitoring period for the vernal pool restoration and burrowing owl burrow installation has been successfully completed. Habitat management for areas outside the restoration areas within the preserve, however, will take effect following approval of this HMP. The Habitat Manager is not responsible for carrying out the restoration activities identified in the On-site Vernal Pool Restoration Plan.

6.0 MANAGEMENT SPECIFICATIONS

The preserve areas are intended to serve as a habitat preserve, and as such, are not compatible with many uses. Activities specifically prohibited include grazing, hunting, off-road vehicle use, dumping, construction activities and staging, vegetation clearing, and removal of natural resources. Exceptions to these prohibitions include selective hand-clearing of vegetation to the extent required by written order of the fire authorities for the express purpose of reducing an identified fire hazard. A number of individual open space management tasks are described below and in Table 2, with these efforts to be conducted at appropriate time intervals, depending on their specific characteristics.

Table 2
LONG-TERM MANAGEMENT TASKS

Task Description	Approximate Implementation Date/Frequency
Baseline inventory	First year of active management
Spring habitat mapping	Map update every 5 years in spring
General monitoring	Monthly during regular maintenance and monitoring visits
Vernal pool monitoring	Twice each year (generally February through April) for a period of 10 years. Each year thereafter, one visit (generally February).
Upland habitat monitoring	In conjunction with the vernal pool monitoring
Fairy shrimp monitoring	In conjunction with the vernal pool/upland habitat monitoring
Burrowing owl monitoring	In conjunction with the vernal pool/upland habitat monitoring
Exotic plant control	Minimum of twice annually (January/February and again in April/May) beginning with the first year of active management
Exotic animal control	As needed
Fire response planning	As needed
Annual reports	Annually/January 15
Barrier and sign inspection/repair	In conjunction with monthly monitoring visits and a thorough inspection annually (October)/repair to occur as needed
Educational brochure	Once – within 3 months of active management
Trash removal	In conjunction with monthly monitoring visits

6.1 HABITAT MONITORING

Improving and maintaining the health and diversity of habitat contained within the preserve areas are the basis for successful management. To assist the Habitat Manager in prioritizing management tasks and to provide information to the general public, City, and researchers regarding the overall state of the open space areas, the Habitat Manager will monitor and document habitat types and conditions on a regular basis. These activities will include the ongoing surveys and tasks described below.

6.1.1 Baseline Inventory

Upon completion of the five-year maintenance and monitoring program associated with the On-site Vernal Pool Restoration Plan, the Habitat Manager will be provided with the final vernal pool monitoring report and associated maps in digital format. The Habitat Manager will conduct a site visit to verify the mapping and make any changes based on site conditions. This information will incorporate the resource data contained in this HMP (Figures 4 and 5) as well as the resource data following completion of the On-site Vernal Pool Restoration Plan and will be updated, as appropriate, to provide a preserve database and accurate vegetation/sensitive resources map. Specifically, this information will be used to measure vegetation community changes resulting from both natural and man-made causes as well as to evaluate the success of management efforts in subsequent years.

The baseline inventory will be conducted once during the first year of active management.

6.1.2 Long-term Habitat Monitoring and Documentation

Vegetation communities and boundaries may change over time due to natural processes such as fire, flood, and succession. In addition, the preserve areas could be susceptible to indirect impacts from adjacent development, particularly along the development/preserve margins. Any changes within the preserve areas may affect the functions and values provided by the existing vegetation communities, with monitoring and documentation of such changes in both existing and restored habitats therefore important to successful long-term management. Specifically, information obtained from regularly monitoring and documenting changes in open space habitats will assist the Habitat Manager in determining and prioritizing future management tasks.

Methods

Spring Habitat Mapping

The Habitat Manager will conduct spring habitat mapping to note changes in vegetation communities. Updated vegetation maps should be submitted to the USFWS, CDFG, and City every 5 years.

General Monitoring

The preserve areas will be visually inspected for changes during monthly maintenance and monitoring visits, and all observations will be documented. Any substantial changes will be monitored more closely to determine the necessity of additional measures. Recommendations from such activities will be submitted to the City for review and information prior to implementation. Vegetation and sensitive species mapping should be conducted during regular site monitoring, and updated maps

should be submitted to the USFWS, CDFG, and City every 5 years.
In addition, the Habitat Manager will conduct monthly site visits to assess the condition of the preserve areas visually and note any problems in need of attention. Such visits shall include the monitoring of the spread of exotic plant species and accumulation of trash/debris. The preserve area fences and signs (discussed in Section 6.6 below) will be inspected and any necessary repairs noted. All applicable monitoring data will be forwarded to the City for incorporation into the MSCP database.

If substantial changes are noted, the areas in question will be monitored more closely to determine if additional measures are appropriate. Any recommendations resulting from such activities will be submitted to the USFWS, CDFG, and City for review and approval prior to implementation.

Vernal Pool Monitoring

The restored and preserved vernal pools within the preserve areas will be visited to assess their condition. Each pool will be visually monitored and a species list created. The list will note the presence of exotic species and estimate cover for each species present.

Upland Habitat Monitoring

The condition of the upland habitats on site will be visually assessed. A general species list will be created for each habitat type and the vegetation map will be updated to reflect site conditions.

Schedule

Spring Habitat Mapping

The Habitat Manager will update spring habitat mapping every 5 years following completion of the On-site Vernal Pool Restoration Plan using a current aerial photograph.

General Monitoring

The condition and extent of existing and restored habitats within the preserve will be monitored and documented during monthly site visits.

Vernal Pool Monitoring

The restored and preserved vernal pools within the preserve areas will be visited twice during the rainy season (generally February and April) each year for a period of 10 years. Each year thereafter, the restored and preserved vernal pools within the preserve areas will be visited once during the rainy season (generally February). The exact timing of the visits will depend on seasonal rainfall. The visits should be timed to best identify vernal pool plant and animal species. These visits are in addition to the general monitoring visits described above.

Upland Habitat Monitoring

Monitoring of the upland vegetation communities within the preserve areas will occur in conjunction with the vernal pool monitoring.

6.2 SENSITIVE SPECIES MONITORING

Preservation of sensitive plant and animal populations within the preserve areas is one step in achieving the overall long-term conservation of these species. Monitoring of sensitive species located within open space has 2 purposes: (1) to identify short-term threats to species persistence; and (2) to identify longer-term trends that may suggest that a population is in decline. Adaptive management measures may be required to intervene when either natural or man-made disturbances or effects appear to be adversely influencing a sensitive species.

6.2.1 Methods

It is the responsibility of the Habitat Manager to evaluate the status of the preserved species within preserve areas and to institute protective measures if any individual species becomes threatened. Monitoring of sensitive species populations will vary based on the target species but will include the use of specific survey protocols and methodologies, established monitoring locations, and specific data collection and analysis techniques. Not all monitoring parameters can be identified within the context of this plan because some parameters will be dependent on a detailed assessment of field conditions. In each assessment, however, the Habitat Manager will observe and document sensitive species locations and conditions. Monitoring/reporting efforts will include all previously documented sensitive species (Appendices A and B and Sections 2.1.2 and 2.1.3 of this report), particularly San Diego and Riverside fairy shrimp monitoring as well as any additional sensitive species observed.

Fairy Shrimp Monitoring

A USFWS permitted biologist will conduct non-protocol wet season fairy shrimp surveys in the preserved and restored vernal pools within the preserve areas. Only pools holding water during scheduled site visits will be surveyed.

Coastal California Gnatcatcher Monitoring

Gnatcatchers observed during site visits will be noted. No focused surveys will occur.

Burrowing Owl Monitoring

A qualified biologist will conduct non-protocol burrowing owl surveys in appropriate preserved areas on site. Owls observed during other site visits also will be noted.

Monitoring for Other Sensitive Species

All sensitive species observed during site visits will be noted and recorded on updated maps.

6.2.2 Schedule

Fairy Shrimp Monitoring

Monitoring for fairy shrimp will occur in conjunction with the vernal pool monitoring described above.

Coastal California Gnatcatcher Monitoring

Monitoring for coastal California gnatcatchers will occur in conjunction with the upland habitat monitoring as well as opportunistically during all site visits.

Burrowing Owl Monitoring

Monitoring for burrowing owls will occur in conjunction with the upland habitat monitoring as well as opportunistically during all site visits.

Monitoring for Other Sensitive Species

Monitoring for other sensitive plant and animal species populations will be conducted opportunistically during all site visits.

6.3 CONTROL OF EXOTIC SPECIES

Exotic plant and animal species through urban edge effects could result in degradation of both native habitats and associated wildlife populations. The Habitat Manager will implement the following measures to control introduction of exotic plants and animals in the preserve areas.

6.3.1 Exotic Plant Control

There are numerous exotic plant species known to occur within vernal pool and upland habitats in the Otay Mesa area. The control of exotic plant species will include coordination with land developers/ owners both within and adjacent to the project sites as well as habitat managers in the adjacent MHPA. The intent of such interaction will be to provide information/education to local land developers/owners regarding exotic plant species as well as to increase the efficiency of exotic plant control programs in adjacent areas. A list of exotic pest plant species of local concern is provided in Table 3 below. Species to be controlled are not limited to those listed below. The Habitat Manager will be responsible for identifying other exotic species in need of control.

Exotic plant species removal will commence when Zero Tolerance Species are identified such that no Zero Tolerance Species occur on site and/or the percent cover of the other exotic species (Moderate Tolerance Species) has increased 5 percent over the baseline established during the first year of monitoring. Zero Tolerance Species include species ranked High by Cal-IPC. Species that receive a high ranking:

> "have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically." (Cal-IPC 2006)

Zero Tolerance Species will be identified and mapped during initial site visits to the preserve areas. They will be removed within 2 weeks after their discovery.

Table 3 EXOTIC PEST PLANT SPECIES OF CONCERN	
Scientific Name	**Common Name**
Atriplex semibaccata	Australian salt bush
Brassica nigra	black mustard
Cotula coronopifolia	African brass buttons
Erodium sp.*	filaree
Eucalyptus sp.	eucalyptus
Lolium multiflorum	Italian ryegrass
Lythrum hyssopifolium	grass poly
Malva parviflora	cheeseweed
Marrubium vulgare	horehound
Mesembryanthemum sp.*	iceplant
Nicotiana glauca	tree tobacco
Polypogon monspeliensis	rabbitsfoot grass
Rumex crispus	curly dock
Salsola tragus	Russian thistle
Tamarix sp.*	salt cedar

*All species of this genus should be treated as pest species

Moderate Tolerance Species include species that:

> "have substantial and apparent – but generally not severe – ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread." (Cal-IPC 2006)

Methods

Control of exotic plant species will include 3 principal steps:

1) Removal of Existing Exotic Plants – In general, exotic plant (weed) removal will be accomplished by hand or mechanical means. The use of gas-powered line trimmers and herbicide in the preserve areas will be restricted to site-specific applications that receive prior approval by the Habitat Manager. No herbicide will be used within or adjacent to the vernal pools on site.

2) Prevention/Reduction of Exotic Plant Introduction – A prohibition against the use of invasive species (Table 3 and any additional species identified by the Habitat Manager) for landscaping within applicable portions of the project site have been included in the codes, covenants, and restrictions documents for development. The Habitat Manager will provide a list of exotic pest

plant species to all Homeowner Associations (HOAs) and commercial tenants within the site, with these groups to provide copies of the table to their landscape contractors.

3) Removal of Introduced Exotic Plants – The Habitat Manager will be responsible for removing populations of all species listed in Table 3 and all Zero Tolerance Cal-IPC Invasive Plant Inventory species from the preserve areas within 2 weeks after their discovery. These activities will be conducted so as to remove exotic species to the maximum extent practicable, although it is acknowledged that complete removal of all exotic plant species may be infeasible.

Schedule

Removal of exotic plant species will be a focus of the Habitat Manager's duties, with 2 focused annual weeding events to be conducted in January/February and again in April/May. Additional weeding can occur on an as-needed basis during the remainder of the year. The Habitat Manager may modify this schedule as necessary to accommodate annual fluctuations in weed growth. Prevention/reduction of exotic species introduction will be an on-going process.

6.3.2 Exotic Animal Control

Several exotic animal species may be present now or in the future (either in the preserve or adjacent areas), including Argentinean ant (*Iridomyrmax humilis*) and European starling (*Sturnus vulgaris*). The Argentinean ant displaces native ants that comprise the principal food source for horned lizards, while European starlings compete with native species for food sources.

Methods/Schedule

Exotic animal species will be noted during all site visits. If a population of an exotic animal species poses a threat to the preserve areas, a control/eradication program will be coordinated with the USFWS, CDFG, and/or City, if appropriate. Control and eradication efforts will be implemented at the most appropriate time(s) of year and will reflect current field conditions and observations regarding the target species. No exotic animal species control is expected to be necessary and will be implemented only under extreme conditions.

6.4 FIRE MANAGEMENT

Fire is an important element in the ecology of southern California and presents a potential hazard to buildings located adjacent to open space areas.

6.4.1 Project Design Features

The design of the proposed development projects have incorporated a number of measures to minimize impacts from fire, including structural design, sprinklers, and provision of appropriate brush management zones. By minimizing fire potential in open space to affect local development, these measures would reduce potential requirements for fire suppression activities within the preserve areas.

6.4.2 Brush Management

The authorized brush management area would be clearly marked with flagging, signs and/or fencing, and no vehicle/equipment access; disturbance or brush management related activities would be allowed in the preserve areas. Brush management activities adjacent to the preserve would be conducted by a contractor approved by the Habitat Manager and would be monitored by the Habitat Manager and/or a City-approved biologist. As part of this process, the Habitat Manager may require additional protection measures, such as supplemental fencing/signing, monitoring, restriction of equipment access, use of selective vegetation removal, and minimizing irrigation (e.g., with drip systems). Funding for these additional measures would be the responsibility of the adjacent landowner wishing to conduct brush management activities within the preserve areas.

6.4.3 Fire Response Planning

Access would be provided from the project site to open space areas in the event of fire. When requested, the Habitat Manager will coordinate with the local fire marshal to discuss appropriate access locations and measures to minimize impacts to sensitive biological resources in the event of a fire.

6.5 ANNUAL REPORT

An annual report summarizing the status of the preserve areas (including restored areas), results of the annual surveys, and all major actions taken since the last assessment will be provided to the USFWS, CDFG, and City each year. This annual report will include: (1) information on the extent and overall health of the various habitats present within the preserve areas; (2) any changes to the health or distribution of sensitive plant and animal species observed (provided on a map); (3) any observed changes resulting from natural or man-made causes; (4) summary of any management issues/tasks addressed during the last year; and (5) tasks or recommendations for changes in management identified for the next year. In addition, the annual report will include: (1) results of floral and faunal surveys; (2) photographs of the site from fixed photo points; (3) summary of the endowment; (4) funds generated, expenses incurred in performing site management, and year-end balance; (5) locations of sensitive species plotted on a site map; and (6) site maps providing information on the cumulative areas of exotic species, trespass, dumping, and other concerns. This report also will compare the most recent data with that collected in previous years, and will outline appropriate remedial measures if habitat or sensitive species issues are noted.

6.6 OPEN SPACE BARRIERS

Development barriers will be constructed as part of project development to discourage unauthorized access and protect sensitive resources within the preserve areas. The barriers would consist of a 6-foot tall chain link fence (treated to minimize appearance) or a block wall installed along the entire length of boundary dividing development and preserve areas. Barrier installation is not a component of this HMP nor is it the responsibility of the Habitat Manager. As part of the development project, the project proponent will construct the fences.

Methods/Schedule

Following completion of the five-year On-site Vernal Pool Restoration Plan maintenance and monitoring program, the Habitat Manager will assume barrier inspection and replacement responsibilities. Inspection of the barriers will occur during monthly patrols, with a thorough barrier inspection conducted annually (in October). Ongoing barrier inspection and maintenance costs would be included in the HMP annual budget estimate. In the event that the barrier/fence is damaged or removed, the Habitat Manager would immediately replace it. If appropriate, the Habitat Manager also would inform the Code Enforcement and/or Police Department of the City of the damage.

6.7 PUBLIC AWARENESS

Acceptance of the preserve areas as a valuable amenity by the community is an important consideration for the long-term viability of associated open space resources. To that end, steps will be taken to encourage participation by local residents and community members in the stewardship of the preserve areas. It is also a goal of this plan that community members take pride in the maintenance and protection of the preserves. The community can help police the preserve areas and assist the Habitat Manager, who cannot be present 24 hours a day, in preventing vandalism and unauthorized activities from occurring.

6.7.1 Measures

The following measures will be taken to maximize public awareness and acceptance of the open space:

- A total of twenty 12- by 6-inch steel signs attached to the fences at regular intervals will provide notice in both English and Spanish that the preserve areas are ecological preserve areas and that trespassing is prohibited. Creation, installation, and maintenance of these signs will be the responsibility of the Habitat Manager.

- Two 24- by 24-inch interpretive signs will be installed, one at each preserve area, to help educate the community on local ecology, the purpose and need of the preserve areas, common and/or sensitive species present, and the need for preservation of the area. The interpretive signs will be 24 by 24 inches and include other important information such as rattlesnake warnings, what to do in the case of an emergency, and a number to call for any suspected violations of open space rules. Creation, installation, and maintenance of these signs will be the responsibility of the Habitat Manager.

- The Habitat Manager will inform residents (or other applicable individuals) that any damage to or alteration of barriers would violate the Municipal Code, and be subject to possible action, fine, and/or criminal charges.

- The Habitat Manager will prepare and distribute an educational brochure to inform residents and businesses of the sensitivity of adjacent habitat, and how to minimize impacts to habitat. The brochure will include information regarding responsible pet care, proper landscape maintenance techniques, brush management, water quality, human intrusion, and lighting and noise requirements. It also will inform residents of the importance of not collecting plants or animals within the habitat. In order to help enforce the requirements, contact information for the City Neighborhood Code Compliance will be included in the brochure.

6.7.2 Schedule

The Habitat Manager will schedule and organize work parties or events on an as-needed basis.

Within 3 months of the start of habitat management activities, the Habitat Manager will install all signs and distribute educational brochures to the current residents adjacent to the preserve areas.

6.8 ADDITIONAL MANAGEMENT CONCERNS

6.8.1 Trash Removal

The Habitat Manager will be responsible for the removal of trash from the preserve areas. Trash removal would typically occur on an as-needed basis and would be conducted as an element of monthly open space monitoring and reconnaissance by the Habitat Manager. In cases of excessive trash disposal within the preserve areas, the Habitat Manager may enlist the help of community volunteer groups, as discussed above in Section 6.7.1.

6.8.2 Illegal Occupancy

Illegal occupancy is a common problem in open space areas within San Diego County. The Habitat Manager will regularly survey the site for encampments and report them to the City and applicable law enforcement agencies.

6.8.3 Poaching/Collecting

Removal of any plants, animals, rocks, minerals, or other natural resources will be prohibited within the preserve areas. The Habitat Manager will post signs advising visitors of this policy and warning them of the potential legal consequences. Anyone found removing natural resources would be informed, in a non-confrontational manner, that these activities are illegal. The Habitat Manager should maintain a log of all incidences of collecting within the preserve. Should a situation turn confrontational or if requests to discontinue illegal activities are ignored, the Habitat Manager shall report the offender(s) to the City and applicable law enforcement agencies.

The Habitat Manager may, at his/her discretion, allow seed collection and plant cuttings to be used for revegetation efforts within or outside of the preserve areas. Any such activities will take place under the direct supervision of the Habitat Manager, and the amount of collected plant materials will be limited to ensure protection of on-site resources.

6.8.4 Lighting

Lighting from the developed portions of the projects will not be directed toward the preserve areas. Specifically, project design included a number of features intended to prevent lighting impacts in the preserve areas, such as prohibiting direct lighting (except temporary security lighting) into the MHPA, and minimizing the effects of exterior lighting in other open space areas through proper direction and shielding of light fixtures and/or use of low sodium bulbs. The design of all project lighting features will conform to the guidelines in the City MSCP Subarea Plan Adjacency Guidelines (City 1997a). The Habitat Manager will notify any neighbors who are in violation of these lighting restrictions. If the issue is not resolved, the Habitat Manager shall report the offender(s) to the City and applicable law enforcement agencies.

6.8.5 Fencing

In addition to the open space perimeter barriers described above in Section 6.6, fencing can be used as a short- or long-term tool to protect habitat if encroachment becomes a problem and other means to deter unauthorized access (e.g., signing and notices to local residents) are not effective. Fencing may also be used for the following specific purposes:

- Protection of any revegetated habitat areas (e.g., as required to replace habitat after catastrophic natural events such as fires).
- Prevention of unauthorized vehicle access.
- Prevention of unauthorized trail formation within the preserve areas.

Any proposed use of fencing within the preserve areas (except the barriers described in Section 6.6) will be identified by the Habitat Manager based on observed site conditions and related issues (e.g., unauthorized access). The Habitat Manager would then submit proposed fencing needs and locations to the City for approval prior to installation. Funding for fence installation would be derived from the identified HMP budget, and could (for example) be provided via the previously described contingency fund.

7.0 REFERENCES

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APPENDIX A

PLANT SPECIES OBSERVED

Appendix A
PLANT SPECIES OBSERVED – CANDLELIGHT VILLAS EAST AND WEST

SCIENTIFIC NAME	COMMON NAME	HABITAT‡
LYCOPODIAE		
Selaginellaceae – Moss Family		
Selaginella bigelovii	spike moss	MSS
Selaginella cinerascens	ashy spike-moss	MSS
MONOCOTYLEDONEAE		
Cyperaceae - Sedge Family		
Eleocharis sp.	spike-rush	
Juncaginaceae - Arrow-grass Family		
Lilaea scilloides	flowering-quillwort	VP
Juncaceae – Rush Family		
Juncus bufonius	toad rush	DH
Liliaceae – Lily Family		
Calochortus splendens	splendid mariposa	MSS
Yucca schidigera	Mojave yucca	MSS
Dichelostemma capitatum	blue dicks	MSS
Poaceae – Grass Family		
Avena barbata	slender wild oat	MSS, DH
Bromus diandrus	ripgut grass	NNG
Bromus hordeaceus	soft chess	MSS, DH
Bromus madritensis ssp. *rubens*	red broom	MSS, DH
Cynodon dactylon	Bermuda grass	DH
Gastridium ventricosum	nit grass	DH
Hordeum intercedens	wild barley	DH
Hordeum jubatum	foxtail barley	DH
Hordeum murinum	hare barley	DH
Lamarckia aurea	golden top	DH
Lolium perenne	perennial ryegrass	DH
Muhlenbergia microsperma	littleseed muhly	DH
Phalaris lemmonii	Lemmon's canary grass	DH
Poa annua	annual bluegrass	DH
Polypogon monspeliensis	annual beardgrass	DH
Schismus barbatus	Mediterranean schismus	DH
Bromus madritensis ssp. *rubens*	foxtail chess	DH
Nassella lepida	foothill needlegrass	MSS
Nasella pulchra	purple needlegrass	MSS
Vulpia myuros	foxtail fescue	MSS, DH

Appendix A (cont.)
PLANT SPECIES OBSERVED – CANDLELIGHT VILLAS EAST AND WEST

SCIENTIFIC NAME	COMMON NAME	HABITAT‡
DICOTYLEDONEAE		
Aizoaceae – Carpet-Weed Family		
Mesembryanthemum nodiflorum	slender-leaved iceplant	DH
Mesembryanthemum crystallinum	iceplant	DH
Amaranthaceae – Amaranth Family		
Amaranthus blitoides	prostrate amaranthus	DH
Anacardiaceae – Sumac Family		
Malosma laurina	laurel sumac	MSS
Rhus integrifolia	lemonadeberry	MSS
Schinus molle	Peruvian pepper tree	
Apiaceae - Carrot Family		
Foeniculum vulgare	fennel	
Asteraceae – Sunflower Family		
Ambrosia chenopodiifolia	San Diego bur-sage	MSS
Artemisia californica	California sagebrush	MSS
Baccharis pilularis	coyote brush	
Baccharis salicifolia	mule fat	MSS
Baccharis sarathroides	broom baccharis	DH
Carduus pycnocephalus	Italian thistle	MSS, DH
Centaurea melitensis	tocalote	MSS, DH
Chamomilla suaveolens	pineapple weed	DH
Chrysanthemum coronarium	garland daisy	MSS, DH
Conyza canadensis	horseweed	DH
Conyza coulteri	Coulter's fleabane	DH
Deinandra fasciculata	fascicled tarplant	MSS, DH
Encelia californica	common encelia	MSS
Eriophyllum confertiflorum	golden yarrow	MSS
Filago californica	California filago	MSS, DH
Gnaphalium californicum	California everlasting	MSS
Gnaphalium canescens	white everlasting	MSS
Heterotheca grandiflora	telegraph weed	DH
Hypochaeris glabra	smooth cat's-ear	DH
Lactuca serriola	wild lettuce	DH
Lasthenia californica	goldfields	MSS
Lessingia filaginifolia	cudweed aster	MSS
Osmodenia tenella	osmadenia	MSS
Psilocarphus brevissimus	dwarf wooly heads	VP
Sonchus asper	prickly sow thistle	DH
Sonchus oleraceus	sow thistle	DH
Stephanomeria diegensis	San Diego wreath plant	MSS, DH
Stylocline gnaphaloides	everlasting nest straw	MSS
Viguiera laciniata	San Diego County sunflower	MSS

Appendix A (cont.)
PLANT SPECIES OBSERVED – CANDLELIGHT VILLAS EAST AND WEST

SCIENTIFIC NAME	COMMON NAME	HABITAT‡
DICOTYLEDONEAE (cont.)		
Boraginaceae – Borage Family		
Amsinckia intermedia	fiddleneck	
Amsinckia menziesii	rancher's fireweed	MSS
Heliotropium curvassavicum	salt heliotrope	DH
Cryptantha intermedia	popcorn flower	MSS
Plagiobothrys acanthacarpus	adobe popcorn flower	VP, MSS
Brassicaceae – Mustard Family		
Brassica nigra	black mustard	DH
Hirschfeldia incana	short-pod mustard	DH
Lepidium lasiocarpum	sand peppergrass	MSS
Raphanus sativus	radish	
Sisymbrium irio	London rocket	DH
Cactaceae – Cactus Family		
Opuntia prolifera	coastal cholla	MSS
Opuntia littoralis	coast prickly-pear	MSS
Capparaceae – Caper Family		
Isomeris arborea	bladderpod	MSS
Caprifoliaceae - Honeysuckle Family		
Sambucus mexicana	blue elderberry	
Caryophyllaceae – Pink Family		
Cardionema ramosissimum	sand mat	MSS
Spergularia bocconii	Buccone's sand-spurry	DH
Chenopodiaceae – Goosefoot Family		
Atriplex pacifica	southcoast saltscale	MSS, DH
Atriplex semiboccata	Australian saltbush	DH
Chenopodium murale	goosefoot	MSS
Salsola tragus	Russian-thistle, tumbleweed	DH
Convolvulaceae – Morning-Glory Family		
Calystegia macrostegia.	morning glory	MSS
Crassulaceae – Stonecrop Family		
Dudleya pulverulenta	chalk lettuce	MSS
Cuscutaceae – Dodder Family		
Cuscuta californica	witch's hair	MSS
Euphorbiaceae – Spurge Family		
Chamaesyce polycarpa	prostate spurge	
Eremocarpus setigerus	doveweed	
Euphorbia misera	cliff spurge	MSS

Appendix A (cont.)

PLANT SPECIES OBSERVED – CANDLELIGHT VILLAS EAST AND WEST

SCIENTIFIC NAME	**COMMON NAME**	**HABITAT‡**
DICOTYLEDONEAE (cont.)		
Fabaceae – Pea Family		
Astragalus trichopodus var. *lonchus*	ocean locoweed	
Lotus scoparius var. *scoparius*	California broom, deerweed	MSS
Medicago polymorpha	California burclover	DH
Melilotus albus	white sweetclover	DH
Melilotus indicas	sourclover	DH
Gentianaceae – Gentian Family		
Centaurium venustum	canchalagua	
Geraniaceae – Geranium Family		
Erodium brachycarpum	short-beak filaree	DH
Erodium botrys	storksbill	DH
Erodium cicutarium	red-stem filaree	DH
Lamiaceae – Mint Family		
Marrubium vulgare	horehound	DH
Salvia apiana	white sage	MSS
Salvia columbariae	chia	
Lythraceae - Loosestrife Family		
Lythrum hyssopifolium	grass poly	DH
Malvaceae – Mallow Family		
Malocothamnus fasciculatus	chaparral mallow	MSS
Malva parviflora	cheeseweed	DH
Sidalcea malvaeflora ssp. *sparsifolia*	wand checker-bloom	MSS
Myrtaceae – Myrtle Family		
Eucalyptus sp.	eucalyptus	EW
Nyctaginaceae – Four O'Clock Family		
Mirabilis californica	wishbone bush	MSS
Onagraceae – Evening Primrose Family		
Camissonia bistorta	California sun cup	MSS
Phytolaccaceae – Pokeweed Family		
Phytolacca americana	pokeweed	DH
Plantaginaceae – Plantain Family		
Plantago erecta	dwarf plantain	MSS
Polemoniaceae – Phlox Family		
Eriastrum filifolium	thread-leaf wooly-star	MSS
Eriastrum sapphirinum	wool-star	
Linanthus dianthiflorus	ground pink	
Navarretia hamata	skunkweed	MSS

Appendix A (cont.)
PLANT SPECIES OBSERVED – CANDLELIGHT VILLAS EAST AND WEST

SCIENTIFIC NAME	COMMON NAME	HABITAT‡
DICOTYLEDONEAE (cont.)		
Polygonaceae – Buckwheat Family		
Centrostegia thurberi	Thurber's spineflower	MSS
Chorizanthe brevicornu	brittle spineflower	MSS
Chorizanthe fimbriata	fringed spineflower	MSS
Chorizanthe procumbens	prostrate spineflower	MSS
Eriogonum fasciculatum ssp. *fasciculatum*	California buckwheat	MSS
Polygonum arenastrum	common knotweed	DH
Rumex crispus	curly dock	DH
Primulaceae – Primrose Family		
Anagallis arvensis	scarlet pimpernel	DH
Rhamnaceae – Buckthorn Family		
Rhamnus crocea	spiny redberry	MSS
Rosaceae – Rose Family		
Heteromeles arbutifolium	toyon	MSS
Rubiaceae – Madder Family		
Galium angustifolium	narrow-leaf bedstraw	MSS
Salicaceae – Willow Family		
Salix lasiolepis	arroyo willow	DH
Scrophulariaceae – Figwort Family		
Antirrhinum kelloggii	climbing snapdragon	
Cordylanthus rigidus	dark-tip bird's beak	MSS
Mimulus aurantiacus	San Diego monkeyflower	MSS
Simmondsiaceae – Jojoba Family		
Simmondsia chinensis	jojoba, goat-nut, pignut	MSS
Solanaceae – Nightshade Family		
Nicotiana glauca	tree tobacco	NNG, DH
Tamaricaceae		
Tamarix sp.	tamarisk	DH
PTERIDOPHYTE		
Marsileaceae - Waterclover Family		
Marsilea vestita ssp. *vestita*	water fern	VP

‡Habitat acronyms: DH=disturbed habitat/agricultural field; E=eucalyptus; MSS=maritime succulent scrub; VP=Vernal pool
†Sensitive species

Appendix B

ANIMAL SPECIES OBSERVED

Appendix B
ANIMAL SPECIES OBSERVED OR DETECTED – CANDLELIGHT VILLAS EAST AND WEST

SCIENTIFIC NAME	COMMON NAME	HABITAT‡
INVERTEBRATES		
Crustaceans		
Branchinecta sandiegonensis†	San Diego fairy shrimp	VP
Podura aquatica	aquatic springtail	VP
Streptocephalus wootoni†	Riverside fairy shrimp	VP
Cladocera		
Copepod		
Ostracod		
Insects		
Odonata	dragonfly	NNG
Coccinellidae sp.	ladybug	NNG
Butterflies		
Anthocharis sara	Sara orangetip	NNG
Apodemia mormo virgulti	Behr's metalmark	MSS
Brephidium exilis	pygmy blue	MSS
Coenonympha californica	California ringlet	DH
Cupido amyntula	western tailed-blue	
Erynnis funeralis	duskywing skipper	MSS
Junonia coenia	buckeye	
Paplio rutulus	western tiger swallowtail	NNG
Paplio zelicaon	anise swallowtail	NNG
Pontia protodice	common white	DH
Vanessa atalanta	red admiral	MSS
Vannessa annabella	west coast lady	MSS
Vannessa cardui	painted lady	MSS
VERTEBRATES		
Reptiles		
Uta stansburiana	side-blotched lizard	MSS
Sceloporus occidentali	western fence lizard	MSS
Cnemidophorus hyperythrus†	orange-throated whiptail	MSS
Spea hammondii†	western spadefoot	VP
Hyla regilla	Pacific treefrog	VP

Appendix B (cont)

ANIMAL SPECIES OBSERVED OR DETECTED – CANDLELIGHT VILLAS EAST AND WEST

<u>**SCIENTIFIC NAME**</u>	<u>**COMMON NAME**</u>	<u>**HABITAT‡**</u>
VERTEBRATES (cont)		
<u>**Birds**</u>		
Aphelocoma coerulescens	scrub jay	MSS
Athene cunicularia†	burrowing owl	DH
Buteo jamaicensis	red-tailed hawk	flyover
Cathartes aura	turkey vulture	flyover
Callipepla californica	California quail	MSS
Calypte anna	Anna's hummingbird	E, DH
Calypte costae	Costa's hummingbird	
Tyrannus vociferans	Cassin's kingbird	DH, E
Carduelis psaltria	lesser goldfinch	E
Carpodacus mexicanus	house finch	E, DH
Chamaea fasciata	wrentit	MSS
Charadrius vociferus	killdeer	DH
Circus cyaneus†	northern harrier	flyover
Chordeiles acutipennis	lesser nighthawk	MSS
Sturnus vulgaris	European starling	E
Corvus corax	common raven	flyover
Falco sparverius	American kestrel	DH
Hirundo pyrrhonota	cliff swallow	
Lanius ludovicianus†	loggerhead shrike	DH
Pipilo fuscus	California towhee	MSS
Pipilo maculatus	spotted towhee	
Polioptila californica californica†	Coastal California gnatcatcher	MSS
Psaltriparus minimus	bushtit	MSS
Melospiza melodia	song sparrow	MSS, E
Sturnella neglecta	western meadowlark	DH
Columba livia	rock dove	flyover
Zenaida macroura	mourning dove	DH, E
Stelgidopteryx serripennis	rough-winged swallow	NNG
Accipiter cooperii†	Cooper's hawk	NNG
Aimophila ruficeps canescens	rufous-crowned sparrow	MSS
Elanus leucurus†	white-tailed kite	NNG

Appendix B (cont.)

ANIMAL SPECIES OBSERVED OR DETECTED – CANDLELIGHT VILLAS EAST AND WEST

SCIENTIFIC NAME	COMMON NAME	HABITAT‡
Mammals		
Felis concolor	mountain lion	MSS
Canis latrans	coyote	MSS
Urocyon cinereoargenteus	grey fox	MSS
Spermophilus beecheyi	California ground squirrel	DH
Dipodomys agilis	Pacific kangaroo rat	MSS
Sylvilagus audubonii	desert cottontail	MSS, DH
Thomomys bottae	Botta's pocket gopher	MSS, DH
Chaetodipus fallax fallax†	San Diego pocket mouse	NNG
Neotoma lepida intermedia	San Diego desert woodrat	MSS
Lepus californicus bennettii†	San Diego black-tailed jackrabbit	

‡Habitat acronyms: DH=disturbed habitat/agricultural field; E=eucalyptus; MSS=maritime succulent scrub; NNG=non-native grassland; VP=vernal pool

†Sensitive species

APPENDIX C

EXPLANATION OF STATUS CODES FOR PLANT AND ANIMAL SPECIES

Appendix C
EXPLANATION OF STATUS CODES FOR PLANT AND ANIMAL SPECIES

U.S. Fish and Wildlife Service (USFWS)

FE	Federally listed endangered
FT	Federally listed threatened

California Department of Fish and Game (CDFG)

SE	State listed endangered
ST	State listed threatened
SSC	State species of special concern
Fully Protected and Protected	Fully Protected and Protected species may not be taken or possessed without a permit from the Fish and Game Commission and/or CDFG.

California Native Plant Society (CNPS) Codes

Lists

1A = Presumed extinct.

1B = Rare, threatened, or endangered in California and elsewhere. Eligible for state listing.

2 = Rare, threatened, or endangered in California but more common elsewhere. Eligible for state listing.

3 = Distribution, endangerment, ecology, and/or taxonomic information needed. Some eligible for state listing.

4 = A watch list for species of limited distribution. Needs monitoring for changes in population status. Few (if any) eligible for state listing.

Threat Code Extensions

.1 = Seriously endangered in California (over 80 percent of occurrences threatened/high degree and immediacy of threat)

.2 = Fairly endangered in California (20 to 80 percent occurrences threatened)

.3 = Not very endangered in California (less than 20 percent of occurrences threatened or no current threats known)

Note that all List 1A (presumed extinct in California) and some List 3 (need more information- a review list) plants lacking any threat information receive no threat code extension. Also, these Threat Code guidelines represent a starting point in the assessment of threat level. Other factors, such as habitat vulnerability and specificity, distribution, and condition of occurrences, are also considered in setting the Threat Code.

Appendix D

PROPERTY ANALYSIS RECORD (PAR)

PAR

Habitat Planning In Perpetuity

The Property Analysis Record

Title	Candlelight Open Space Preserve
Dataset	CA005
ID	WPH15
Prepared by	Stephen Neudecker, Ph.D.
Date	02/02/2007

U.S.G.S.Quad 1:	Imperial Beach	U.S.G.S.Quad 2:	
U.S.G.S.Quad 3:		U.S.G.S.Quad 4:	

Management type:	Easement
Prepared by	Stephen Neudecker, Ph.D.
Date	02/02/2007
Address	7578 El Cajon Blvd., Suite
City, State, Zip	La Mesa, CA 91941
Phone	619-462-1515
Location/Jurisdiction	San Diego
County	San Diego
Acres	27

Project Status	Start Date	Completion	Status/Notes
Construction	/ /	/ /	
Restoration	/ /	/ /	
Stewardship	/ /	/ /	

	Owner	Proponent
Name	West Pacific Housing	D.R. Horton, Inc.
Organization	West Pacific Housing	D.R. Horton, Inc.
Address	5790 Fleet Street, Suite 210	5790 Fleet Street, Suite 210
City, State, Zip	Carlsbad, CA 92008	Carlsbad, CA 92008
Phone	760-929-1600	760-929-1600
Fax	760-929-9476	760-929-9476
E-Mail address	jchirsch@drhorton.com	jchirsch@drhorton.com

	Consultant #1	Consultant #2
Name	Dr. Stephen Neudecker	
Organization	HELIX Environmental	
Address	7578 El Cajon Blvd., Suite	
City, State, Zip	La Mesa, CA 91941	
Phone	619-462-1515	
Fax	619-462-0552	
E-Mail address	steveN@helixepi.com	
Specialty	Permits & Endangered	

Cost Year	0	
Date of site visit:	/ /	
Development Project		
Name	Candlelight Open Space Preserve	
Acres	15	
Stage of planning		
Conserved acres	0...	
Mitigation Bank		
Log	No	MBCR: 0
Credit basis		
Stage of planning		

Notes

Relation	Client	Phone	760-929-1600
Name	Mr. James Hirsch	Fax	760-929-9476
Street	5790 Fleet Street, Suite 210	E-mail	kcurtin@drhorton.com
Organization	D.R. Horton		
City, State & Zip	Carlsbad, CA 92008		

Purposes for Preservation	Goals and Objectives
Open Space	Permanent conservation of 14.6-acre, on-site Open Space preserve as required by permits and Biological Opinion.
Endangered Species	Peserve contains San Dieg and Riverside fairy shrimps, coastal sage scrub and coastal California gnatcatcher.
Wetlands	Restore and preserve 0.99 acre of vernal pools.

Section 4 - Documents and References

Property Title: Candlelight Open Space Preserve   Dataset: CA005   PAR ID: WPH15   02/05/2007

	Document & Reference	Contact	Phone/Fax/Email	Date Rcv'd
0	ACOE 404	Corps - IP #20050004-SMJ	858-674-5387	/ /
0	Biotic Assessments and Maps	Greg Mason @ HELIX	619-462-1515	02/05/1907
0	CDFG 1601/1603	Kelly Fisher @ CDFG	858-467-4210	06/12/2006
0	Conservation Easement Document	Dr. Stephen Neudecker @ HELIX	619-462-1515	/ /
0	EIR/EIS	Jeramey Harding, T&B Planning	619-325-0290	/ /
0	General Development Plan	Hunsaker	858-558-4500	/ /
0	Improvement Maps	Hunsaker	858-558-4500	/ /
0	Mitigation and Monitoring Plan	Greg Mason @ HELIX	619-462-1515	02/05/2007
0	Photographs	Greg Mason @ HELIX	619-462-1515	02/05/2007
0	Revegetation/Restoration Plan	Greg Mason @ HELIX	619-462-1515	02/05/2007
0	USFWS 7/10a/4d	Ayoola Florian	760-431-9440,ext 251	/ /

Permits

Agency Permit	Army Corp of Engineers 404		
Permit Purpose	IP #20050004-SMJ		
Date	/ /		
Issued	No	Reporting	No
Standards	No	Restoration	No
PAR	No	Monitoring	No
When Scheduled			
Monitoring Schedule			
Standards for Success			
Comments			

Agency Permit	State Dept. of Fish and Game		
Permit Purpose	SAA #160020060141R5		
Date	07/06/1906		
Issued	No	Reporting	No
Standards	No	Restoration	No
PAR	No	Monitoring	No
When Scheduled			
Monitoring Schedule			
Standards for Success			
Comments	Issued 6/12/06		

Agency Permit	City Requirement		
Permit Purpose	Open Space Preserve		
Date	/ /		
Issued	No	Reporting	No
Standards	No	Restoration	No
PAR	No	Monitoring	No
When Scheduled			
Monitoring Schedule			
Standards for Success			
Comments	Permanently preserve and provide for management or on-site 14.6 Open Space Preserve		

Agency Permit	US Fish and Wildlife Section 7		
Permit Purpose	Biological Opinion		
Date	/ /		
Issued	No	Reporting	No
Standards	No	Restoration	No
PAR	No	Monitoring	No
When Scheduled			
Monitoring Schedule			
Standards for Success			
Comments			

Permits

Agency Permit	Other		
Permit Purpose	18-2006036.02:MEANC		
Date	/ /		
Issued	No	Reporting	No
Standards	No	Restoration	No
PAR	No	Monitoring	No
When Scheduled			
Monitoring Schedule			
Standards for Success			
Comments	410 Water Quality Certification		

Contract Requirements

Item	Requirement	Requirement
Conservation Easements		To be recorded over 14.6-acre Open Space Preserve

Special Districts & Fees

Item	Measure	Fee Rate	Service
Other Districts		0.0000	NONE
Other		0.0000	NONE

Division of Responsibilities

Item	Type	Notes
Debris Removal		In conjunction with monthly monitoring visits
Monitoring, Plant		Vegetation map update every 5 years in spring, monthly during regular maint.
Monitoring, Wildlife		Fairy shrimps, Coastal California gnatcatcher, burrowing owl
Signs, Access Control		Barrier and sign inspection and repair in conjunction with monitoring visits
Trash Collection, Ongoing		Trash removal in conjunction with monitoring visits

Property Uses

Item	Permitted/ Legal	Problem	Notes
Access Points	N		Controlled access, no public access
Agricultural	N		
Equestrian	N		
Fishing	N		
Hiking Trails	N		
Livestock Grazing	N		
Mountain Bikes	N		
Oil/Mineral Extract.	N		
ORV	N		
Passive Recreation	N		
Roads	N		
Shooting/Hunting	N		
Snowmobiles	N		
Timber Harvest	N		

Adjacent Land Use

Item	Permitted/ Legal	Problem	Notes
Dedicated Preserve	Y	None	The preserve is protected by 50-ft. biological buffer plus fuel management zone
Minor Roads	N	None	
Open Space	Y	None	No public access
Residential - High Density	Y	None	Controlled access should minimize incursions
Other	Y	None	Public school

Hydrological Features

Item	Notes
Vernal Pool	0.99 acre in the western and eastern preserves

Degraded Features

Item	Notes
Trails	Dirt roads resulting from off-road vehicles and itinerant dumping
Other Degraded Features	Earthern berms and water-holding basins in depressions

Invasive Exotics

Item	Notes
Starling, European	Within upland habitats
Ant, Argentine Fire	Within upland habitats
Eucalyptus, Red	Within vernal pools and upland habitats
Iceplant, Sea	Within vernal pools and upland habitats
Thistle, Russian	Within vernal pools and upland habitats
Other Plants	Salt cedar, curly dock, rabbitsfoot grass, tree tobacco, horehound, cheeseweed, grass poly, Italian ryegrass, filaree, African brass buttons, black mustard, Australian salt brush within vernal pools and upland habitats

Natural Communities	Acres	Notes (Location condition & Rec.)
-CALIFORNIA		
Other (Other Natural Communities)	2.00	Non-native grassland
Other (Other Natural Communities)	10.80	Maritime succulent scrub
Other (Other Natural Communities)	0.99	Vernal pool

Animal Survey Species Name				Notes (Location condition & Rec.)
-BIRDS				
Gnatcatcher, Coastal Californi (Polioptila californica californica) Status: R	State: None	Federal: LT	Global: G3T2	One individual heard during second protocol survey in eastern maritime succulent scrub canyon approximately 100 feet off site; two individuals observed within Moody Canyon
Owl (Micrathene whitneyi) Status: R	State: CSC	Federal:	Global:	Burrowing owl pellet and evidence of occupation at the northeastern edge of the site and one owl observed in 2004
Other Birds (Other) Status: R	State:	Federal: CSC	Global:	Orange-throated whiptail within canyon area in the eastern portion of open space and maritime succulent scrub in western portion of open space; Southern California rufous-crowned sparrow (one) observed within maritime succulent scrub
-MAMMALS				
Other Mammals (Other) Status: R	State:	Federal: CSC	Global:	San Diego black-tailed jackrabbit observed in maritime succulent scrub
-OTHER CRUSTACEANS				
Shrimp, California Freshwater (Syncaris pacifica) Status: R	State: Endang	Federal: LE	Global: G1	San Diego fairy shrimp occurs within VP1 in the eastern portion of open space and one vernal pool in western portion; Vernal pools in the northwestern portion of preserve created to support Riverside fairy shrimp

Animal Survey Species Name	Notes (Location condition & Rec.)
-REPTILES	
Other Reptiles (Other) Status: R State: Federal: CSC Global:	Western spadefoot found in many of the water-holding basins

Plant Species Name				Acres	Notes (Location condition & Rec.)

LANTS

Other Plants (Other)				0.00	San Diego bur-sage located in maritime succulent scrub
Status:	State:	Global:	Federal:	CNPS	
Other Plants (Other)				0.00	Southcoast saltscale located within the maritime succulent scrub within Moody Canyon within the MHPA in the southwestern corner of the open space
Status:	State:	Global:	Federal:	CNPS	
Other Plants (Other)				0.00	Cliff spurge found in maritime succulent scrub
Status:	State:	Global:	Federal:	CNPS	
Other Plants (Other)				0.00	San Diego barrel cactus found in maritime succulent scrub at westernmost end of the open space; San Diego sunflower found in maritime succulent scrub
Status:	State:	Global:	Federal:	CNPS	

Section 8 - Initial & Capital Tasks and Costs

Property Title: Candlelight Open Space Preserve Dataset: CA005 PAR ID: WPH15 02/05/2007

Budget: PAR

Task list	Specificaton	Unit	Number of Units	Cost / Unit	Annual Cost	Times Years	Total Cost
SITE CONSTRUCTION/MAINT.							
Project Management	Supervise/coordinate	L. Hours	8.00	45.00	360.00	1.0	360.00
Organic Debris Removal	Dump fee	Unit	1.00	150.00	150.00	1.0	150.00
Non-organic Debris Removal	Dump fee	Unit	1.00	150.00	150.00	1.0	150.00
Sub-Total							660.00
BIOTIC SURVEYS							
Project Management	Supervise/coordinate	L. Hours	8.00	45.00	360.00	1.0	360.00
Plant Ecologist	Field Svy. & Reports	L. Hours	16.00	45.00	720.00	1.0	720.00
Wildlife Biologist	Field Svy. & Reports	L. Hours	16.00	45.00	720.00	1.0	720.00
Sub-Total							1,800.00
HABITAT MAINTENANCE							
Seed Collection	Native seeds	Lb.	1.00	80.00	80.00	1.0	80.00
Seed Procurement	Native grasses, 85%	Lb	1.00	85.00	85.00	1.0	85.00
Seeding	Hand seeding	Acre	0.50	700.00	350.00	1.0	350.00
Plant Procurement	Shrubs	1 Gal.	25.00	3.00	75.00	1.0	75.00
Plant Maintenance	Maintenance	L. Hours	20.00	15.00	300.00	12.0	3,600.00
Exotic Plant Control	Hand Removal, Labor	L. Hours	40.00	15.00	600.00	1.0	600.00
Sub-Total							4,790.00
PUBLIC SERVICES							
Patrolling	Patrol	L. Hours	24.00	15.00	360.00	1.0	360.00
Sign, Aluminum	Aluminum 14" X 20"	Item	20.00	20.00	400.00	1.0	400.00
Sign	Access	Item	2.00	202.00	404.00	1.0	404.00
Community Outreach	Meetings	L. Hours	8.00	45.00	360.00	1.0	360.00
Sub-Total							1,524.00
GENERAL MAINTENANCE							
Project Management	Supervise/coordinate	L. Hours	12.00	45.00	540.00	1.0	540.00
Sub-Total							540.00
REPORTING							
Database Management	Data Input	L. Hours	8.00	45.00	360.00	1.0	360.00
GIS/CAD Management	Data Management	L. Hours	8.00	45.00	360.00	1.0	360.00
Photodocumentation	Field Survey	L. Hours	8.00	45.00	360.00	1.0	360.00
Annual Reports	Summary	L. Hours	24.00	45.00	1,080.00	1.0	1,080.00
Annual Work Plan	Plan and PAR Budget	L. Hours	4.00	45.00	180.00	1.0	180.00
Agency Report	Annual Report	L. Hours	8.00	45.00	360.00	1.0	360.00
Report Production	Labor	L. Hours	8.00	20.00	160.00	1.0	160.00
Sub-Total							2,860.00

Task list	Specificaton	Unit	Number of Units	Cost / Unit	Annual Cost	Times Years	Total Cost
OFFICE MAINTENANCE							
Administrative	Operations	L. Hours	16.00	45.00	720.00	1.0	720.00
Utilities, Annual	Elec., Gas, Water	Sq. Ft.	200.00	1.00	200.00	1.0	200.00
Telephone Charges, Annual	Phone Charges	Person	0.50	1,200.00	600.00	1.0	600.00
Taxes and Fees	Property or District	Year	1.00	100.00	100.00	1.0	100.00
Office Supplies, Year	Stationery/envelopes	Person	1.00	125.00	125.00	1.0	125.00
Office Supplies, Year	Supplies	Person	1.00	192.00	192.00	1.0	192.00
Furniture	Desk	Item	1.00	250.00	250.00	1.0	250.00
Furniture	Chair	Item	1.00	150.00	150.00	1.0	150.00
Furniture	Bookcase, 3'x5'	Item	1.00	150.00	150.00	1.0	150.00
Furniture	File cabinet	Item	1.00	400.00	400.00	1.0	400.00
Telephone	Touch-tone	Item	1.00	95.00	95.00	1.0	95.00
E-Mail	Services	Year	0.50	360.00	180.00	1.0	180.00
Computer, PC & Monitor	133 MHz Pentium	Item	0.50	2,100.00	1,050.00	1.0	1,050.00
Sub-Total							4,212.00
FIELD EQUIPMENT							
Vehicle	Mileage	Mile	500.00	0.50	250.00	1.0	250.00
Cellular Phone 3 watt	Phone unit	Item	0.50	150.00	75.00	1.0	75.00
Cellular Phone	Phone,Monthly charge	Item	0.50	30.00	15.00	1.0	15.00
Sub-Total							340.00
OPERATIONS							
Endowment	Process endowment	L. Hours	4.00	30.00	120.00	1.0	120.00
Insurance	General	L. Hours	8.00	30.00	240.00	1.0	240.00
Budgeting	Budget & reconcile	L. Hours	4.00	30.00	120.00	1.0	120.00
Property Tax Exemption	File	L. Hours	4.00	30.00	120.00	1.0	120.00
Supervisor Site Visit	Site visits	L. Hours	8.00	45.00	360.00	1.0	360.00
Project Accounting	Setup and maintain	L. Hours	8.00	30.00	240.00	1.0	240.00
Travel	Mileage	Miles	250.00	0.27	67.50	1.0	67.50
Sub-Total							1,267.50
CONTINGENCY & ADMINISTRATION							
Contingency							1,799.35
Administration							4,354.43
Sub-Total							6,153.78
Total							24,147.28

Section 9 - Ongoing Tasks and Costs

Property Title: Candlelight Open Space Preserve | Dataset: CA005 | PAR ID: WPH15 | 02/05/2007

Budget: PAR

Task list	Specificaton	Unit	Number of Units	Cost / Unit	Annual Cost	Divide Years	Total Cost
SITE CONSTRUCTION/MAINT.							
Project Management	Supervise/coordinate	L. Hours	8.00	45.00	360.00	1	360.00
Organic Debris Removal	Dump fee	Unit	1.00	150.00	150.00	1	150.00
Non-organic Debris Removal	Dump fee	Unit	1.00	150.00	150.00	1	150.00
Sub-Total							660.00
BIOTIC SURVEYS							
Project Management	Supervise/coordinate	L. Hours	8.00	45.00	360.00	1	360.00
Plant Ecologist	Field Svy. & Reports	L. Hours	16.00	45.00	720.00	1	720.00
Wildlife Biologist	Field Svy. & Reports	L. Hours	16.00	45.00	720.00	1	720.00
Sub-Total							1,800.00
HABITAT MAINTENANCE							
Seed Collection	Native seeds	Lb.	1.00	80.00	80.00	5	16.00
Seed Procurement	Native grasses, 85%	Lb	1.00	85.00	85.00	5	17.00
Seeding	Hand seeding	Acre	0.50	700.00	350.00	5	70.00
Plant Procurement	Shrubs	1 Gal.	25.00	3.00	75.00	5	15.00
Plant Maintenance	Maintenance	L. Hours	20.00	15.00	300.00	1	300.00
Supplemental Planting	Plant Replacement	L. Hours	40.00	15.00	600.00	1	600.00
Exotic Plant Control	Hand Removal, Labor	L. Hours	40.00	15.00	600.00	1	600.00
Sub-Total							1,618.00
PUBLIC SERVICES							
Patrolling	Patrol	L. Hours	24.00	15.00	360.00	1	360.00
Sign, Aluminum	Aluminum 14" X 20"	Item	20.00	20.00	400.00	7	57.14
Sign	Access	Item	2.00	202.00	404.00	7	57.71
Community Outreach	Meetings	L. Hours	8.00	45.00	360.00	1	360.00
Sub-Total							834.85
GENERAL MAINTENANCE							
Project Management	Supervise/coordinate	L. Hours	12.00	45.00	540.00	1	540.00
Sub-Total							540.00
REPORTING							
Database Management	Data Input	L. Hours	8.00	45.00	360.00	1	360.00
GIS/CAD Management	Data Management	L. Hours	8.00	45.00	360.00	1	360.00
Photodocumentation	Field Survey	L. Hours	8.00	45.00	360.00	1	360.00
Annual Reports	Summary	L. Hours	24.00	45.00	1,080.00	1	1,080.00
Annual Work Plan	Plan and PAR Budget	L. Hours	4.00	45.00	180.00	1	180.00
Agency Report	Annual Report	L. Hours	8.00	45.00	360.00	1	360.00
Report Production	Labor	L. Hours	8.00	20.00	160.00	1	160.00

Task list	Specificaton	Unit	Number of Units	Cost / Unit	Annual Cost	Divide Years	Total Cost
Sub-Total							2,860.00
OFFICE MAINTENANCE							
Administrative	Operations	L. Hours	16.00	45.00	720.00	1	720.00
Utilities, Annual	Elec., Gas, Water	Sq. Ft.	200.00	1.00	200.00	1	200.00
Telephone Charges, Annual	Phone Charges	Person	0.50	1,200.00	600.00	1	600.00
Taxes and Fees	Property or District	Year	1.00	100.00	100.00	1	100.00
Office Supplies, Year	Stationery/envelopes	Person	1.00	125.00	125.00	1	125.00
Office Supplies, Year	Supplies	Person	1.00	192.00	192.00	1	192.00
Furniture	Desk	Item	1.00	250.00	250.00	10	25.00
Furniture	Chair	Item	1.00	150.00	150.00	5	30.00
Furniture	Bookcase, 3'x5'	Item	1.00	150.00	150.00	8	18.75
Furniture	File cabinet	Item	1.00	400.00	400.00	10	40.00
Telephone	Touch-tone	Item	1.00	95.00	95.00	5	19.00
E-Mail	Services	Year	0.50	360.00	180.00	1	180.00
Computer, PC & Monitor	133 MHz Pentium	Item	0.50	2,100.00	1,050.00	4	262.50
Sub-Total							2,512.25
FIELD EQUIPMENT							
Vehicle	Mileage	Mile	500.00	0.50	250.00	1	250.00
Cellular Phone 3 watt	Phone unit	Item	0.50	150.00	75.00	5	15.00
Cellular Phone	Phone,Monthly charge	Item	0.50	30.00	15.00	5	3.00
Sub-Total							268.00
OPERATIONS							
Endowment	Process endowment	L. Hours	4.00	30.00	120.00	1	120.00
Insurance	General	L. Hours	8.00	30.00	240.00	1	240.00
Budgeting	Budget & reconcile	L. Hours	4.00	30.00	120.00	1	120.00
Property Tax Exemption	File	L. Hours	4.00	30.00	120.00	1	120.00
Supervisor Site Visit	Site visits	L. Hours	8.00	45.00	360.00	1	360.00
Project Accounting	Setup and maintain	L. Hours	8.00	30.00	240.00	1	240.00
Travel	Mileage	Miles	250.00	0.27	67.50	1	67.50
Sub-Total							1,267.50
CONTINGENCY & ADMINISTRATION							
Contingency							1,236.06
Administration							2,991.27
Sub-Total							4,227.33
Total							16,587.93

PAR(27 ac.)

	Rate %	Total $
INITIAL FINANCIAL REQUIREMENTS		
I & C Revenue		0
I & C Management Costs		17,993
I & C Contingency Expense	10.00	1,799
Total I & C Management Costs		19,792
I & C Administrative Costs of Total I & C Management Costs	22.00	4,354
Total I & C Costs		24,147
Net I & C Management and Administrative Costs		24,147
ANNUAL ONGOING FINANCIAL REQUIREMENTS		
Ongoing Costs		12,360
Ongoing Contingency Expense	10.00	1,236
Total Ongoing Management Costs		13,597
Ongoing Administrative Costs of Total Ongoing Management costs	22.00	2,991
Total Ongoing Costs		16,588
ENDOWMENT REQUIREMENTS FOR ONGOING STEWARDSHIP		
Endowment to Provide Income of $ 16,588		331,760

Endowment per Acre is $ 12,242.

Ongoing Management Costs Based on 5.00% of Endowment per Year.

Ongoing Management Funding is $ 16,588 per Year Resulting in $612 per Acre per Year.

TOTAL CONTRIBUTION	355,907

Appendix R

Climate Action Plan Consistency Checklist
Baranek Consulting Group, Inc., May 2017
~~Greenhouse Gas Analyses~~
~~Scientific Resources Associated, April 2016~~
~~HELIX Environmental, April 2013~~

CLIMATE ACTION PLAN CONSISTENCY CHECKLIST INTRODUCTION

In December 2015, the City adopted a Climate Action Plan (CAP) that outlines the actions that City will undertake to achieve its proportional share of State greenhouse gas (GHG) emission reductions. The purpose of the Climate Action Plan Consistency Checklist (Checklist) is to, in conjunction with the CAP, provide a streamlined review process for proposed new development projects that are subject to discretionary review and trigger environmental review pursuant to the California Environmental Quality Act (CEQA).[1]

Analysis of GHG emissions and potential climate change impacts from new development is required under CEQA. The CAP is a plan for the reduction of GHG emissions in accordance with CEQA Guidelines Section 15183.5. Pursuant to CEQA Guidelines Sections 15064(h)(3), 15130(d), and 15183(b), a project's incremental contribution to a cumulative GHG emissions effect may be determined not to be cumulatively considerable if it complies with the requirements of the CAP.

This Checklist is part of the CAP and contains measures that are required to be implemented on a project-by-project basis to ensure that the specified emissions targets identified in the CAP are achieved. Implementation of these measures would ensure that new development is consistent with the CAP's assumptions for relevant CAP strategies toward achieving the identified GHG reduction targets. Projects that are consistent with the CAP as determined through the use of this Checklist may rely on the CAP for the cumulative impacts analysis of GHG emissions. Projects that are not consistent with the CAP must prepare a comprehensive project-specific analysis of GHG emissions, including quantification of existing and projected GHG emissions and incorporation of the measures in this Checklist to the extent feasible. Cumulative GHG impacts would be significant for any project that is not consistent with the CAP.

The Checklist may be updated to incorporate new GHG reduction techniques or to comply with later amendments to the CAP or local, State, or federal law.

[1] Certain projects seeking ministerial approval may be required to complete the Checklist. For example, projects in a Community Plan Implementation Overlay Zone may be required to use the Checklist to qualify for ministerial level review. See Supplemental Development Regulations in the project's community plan to determine applicability.

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CAP CONSISTENCY CHECKLIST SUBMITTAL APPLICATION

- The Checklist is required only for projects subject to CEQA review.[2]
- If required, the Checklist must be included in the project submittal package. Application submittal procedures can be found in [Chapter 11: Land Development Procedures] of the City's Municipal Code.
- The requirements in the Checklist will be included in the project's conditions of approval.
- The applicant must provide an explanation of how the proposed project will implement the requirements described herein to the satisfaction of the Planning Department.

Application Information

Contact Information

Project No./Name: 319435/Candlelight

Property Address: South of SR-905 along Caliente Avenue

Applicant Name/Co.: Clem Abrams

Contact Phone: (858) 455-5005 Contact Email: N/A

Was a consultant retained to complete this checklist? ☐ Yes ☐ No If Yes, complete the following

Consultant Name: Kim Baranek Contact Phone: 858-922-8604

Company Name: Baranek Consulting Group, Inc. Contact Email: kim@baranekconsulting.com

Project Information

1. What is the size of the project (acres)? 44.19 acres
2. Identify all applicable proposed land uses:
   - ☐ Residential (indicate # of single-family units):
   - ☑ Residential (indicate # of multi-family units): 475 dus
   - ☐ Commercial (total square footage):
   - ☐ Industrial (total square footage):
   - ☐ Other (describe):
3. Is the project or a portion of the project located in a Transit Priority Area? ☐ Yes ☐ No
4. Provide a brief description of the project proposed:

The project involves approval of a PDP, SDP and TM to build multi-family residential dwelling units and recreation areas on three lots covering 23.74 acres of site. Project proposes right-of-way and extension of Caliente Avenue, dedicated open space (including vernal pool restoration) and trails and trail access improvements. Public and private sewer and water infrastructure are proposed. The project proposes 475 units on a 23.74-acre portion of the 44.19-acre project site, with the remaining project site area consisting of open space (17.95 acres) and public roads (2.5 acres).

[2] Certain projects seeking ministerial approval may be required to complete the Checklist. For example, projects in a Community Plan Implementation Overlay Zone may be required to use the Checklist to qualify for ministerial level review. See Supplemental Development Regulations in the project's community plan to determine applicability.

CAP CONSISTENCY CHECKLIST QUESTIONS

Step 1: Land Use Consistency

The first step in determining CAP consistency for discretionary development projects is to assess the project's consistency with the growth projections used in the development of the CAP. This section allows the City to determine a project's consistency with the land use assumptions used in the CAP.

Step 1: Land Use Consistency		
Checklist Item (Check the appropriate box and provide explanation and supporting documentation for your answer)	Yes	No
A. Is the proposed project consistent with the existing General Plan and Community Plan land use and zoning designations?;[3] OR, The project site is designated for Residential under the General Plan, Residential-Medium Density under the Otay Mesa Community Plan and is zoned RM-2-5 and RM-1-1. The 475 units proposed on the 23.74-acre portion of the site results in an overall density of 20 du/ac within the 15-29 du/ac range permitted on site. B. If the proposed project is not consistent with the existing land use plan and zoning designations, and includes a land use plan and/or zoning designation amendment, would the proposed amendment result in an increased density within a Transit Priority Area (TPA) and implement CAP Strategy 3 actions, as determined in Step 3 to the satisfaction of the Development Services Department?; OR, C. If the proposed project is not consistent with the existing land use plan and zoning designations, does the project include a land use plan and/or zoning designation amendment that would result in an equivalent or less GHG-intensive project when compared to the existing designations?	☒	☐
If "***Yes***," proceed to Step 2 of the Checklist. For question B above, complete Step 3. For question C above, provide estimated project emissions under both existing and proposed designation(s) for comparison. Compare the maximum buildout of the existing designation and the maximum buildout of the proposed designation. If "***No***," in accordance with the City's Significance Determination Thresholds, the project's GHG impact is significant. The project must nonetheless incorporate each of the measures identified in Step 2 to mitigate cumulative GHG emissions impacts unless the decision maker finds that a measure is infeasible in accordance with CEQA Guidelines Section 15091. Proceed and complete Step 2 of the Checklist.		

[3] This question may also be answered in the affirmative if the project is consistent with SANDAG Series 12 growth projections, which were used to determine the CAP projections, as determined by the Planning Department.

Step 2: CAP Strategies Consistency

The second step of the CAP consistency review is to review and evaluate a project's consistency with the applicable strategies and actions of the CAP. Step 2 only applies to development projects that involve permits that would require a certificate of occupancy from the Building Official or projects comprised of one and two family dwellings or townhouses as defined in the California Residential Code and their accessory structures.[4] All other development projects that would not require a certificate of occupancy from the Building Official shall implement Best Management Practices for construction activities as set forth in the Greenbook (for public projects).

Step 2: CAP Strategies Consistency			
Checklist Item (Check the appropriate box and provide explanation for your answer)	Yes	No	N/A
Strategy 1: Energy & Water Efficient Buildings			
1. *Cool/Green Roofs*. • Would the project include roofing materials with a minimum 3-year aged solar reflection and thermal emittance or solar reflection index equal to or greater than the values specified in the voluntary measures under California Green Building Standards Code (Attachment A)?; OR • Would the project roof construction have a thermal mass over the roof membrane, including areas of vegetated (green) roofs, weighing at least 25 pounds per square foot as specified in the voluntary measures under California Green Building Standards Code?; OR • Would the project include a combination of the above two options? Check "N/A" only if the project does not include a roof component. The project will include roofing materials with a minimum 3-year aged solar reflection and thermal emittance or solar reflection index equal to or greater than the values specified in the voluntary measures under the California Green Building Standards Code.	☐	☐	☐

4 Actions that are not subject to Step 2 would include, for example: a) discretionary map actions that do not propose specific development, b) permits allowing wireless communication facilities, c) special events permits, d) use permits or other permits that do not result in the expansion or enlargement of a building (e.g., decks, garages, etc.), and e) non-building infrastructure projects such as roads and pipelines. Because such actions would not result in new occupancy buildings from which GHG emissions reductions could be achieved, the items contained in Step 2 would not be applicable.

2. *Plumbing fixtures and fittings* With respect to plumbing fixtures or fittings provided as part of the project, would those low-flow fixtures/appliances be consistent with each of the following: Residential buildings: • Kitchen faucets: maximum flow rate not to exceed 1.5 gallons per minute at 60 psi; • Alternate nonpotable water sources are used for indoor potable water reduction and installed per A4.303.2 of the California Green Building Standards Code and the California Plumbing Code; • At least one qualified ENERGY STAR dischwasher or clothes washer is installed per A4.303.3 of the California Green Building Standards Code; • Nonwater supplied urinals or waterless toilets are installed per A4.303.4 of the California Green Building Standards Code; and • One- and two-family dwellings are be equipped with a demand hot water recirculation system per A4.303.5 of the California Green Building Standards Code? Nonresidential buildings: • Plumbing fixtures and fittings that do not exceed the maximum flow rate specified in Table A5.303.2.3.1 (voluntary measures) of the California Green Building Standards Code (See Attachment A); and • Appliances and fixtures for commercial applications that meet the provisions of Section A5.303.3 (voluntary measures) of the California Green Building Standards Code (See Attachment A)? Check "N/A" only if the project does not include any plumbing fixtures or fittings.	☐	☐	☐
The project will use low-flow fixtures and appliances that are consistent with this strategy.			

Strategy 2: Clean & Renewable Energy			
3. *Energy Performance Standard / Renewable Energy* Is the project designed to have an energy budget that meets the following performance standards when compared to the Title 24, Part 6 Energy Budget for the Standard Design Building as calculated by [Compliance Software certified by the California Energy Commission] (percent improvement over current code): • Low-rise residential – 85% of the Title 24, Part 6 Energy Budget or 15% reduction from the Standard Design Building? • Nonresidential with indoor lighting OR mechanical system, but not both – 95% of the Title 24, Part 6 Energy Budget or 5% reduction from the Standard Design Building? • Nonresidential with both indoor lighting AND mechanical systems – 90% of the Title 24, Part 6 Energy Budget or 10% reduction from the Standard Design Building?[5] The demand reduction may be provided through on-site renewable energy generation, such as solar, or by designing the project to have an energy budget that meets the above-mentioned performance standards, when compared to the Title 24, Part 6 Energy Budget for the Proposed Design Building (percent improvement over current code). Note: For Energy Budget calculations, high-rise residential and hotel/motel buildings are considered non-residential buildings. Check "N/A" only if the project does not contain any residential or non-residential buildings. The project is designed to have an energy budget that shows a 15% improvement when compared to Title 24 (2008), Part 6 Energy Budget for Proposed Design Building, as calculated by Compliance Software certified by the California Energy Commission.	☐	☐	☐

[5] CALGreen defines mechanical systems as equipment, appliances, fixtures, fittings and/or appurtenances, including ventilating, heating, cooling, air-conditioning and refrigeration systems, incinerators and other energy-related systems.

Strategy 3: Bicycling, Walking, Transit & Land Use			
4. *Electric Vehicle Charging* • <u>Multiple-family projects of 17 dwelling units or less</u>: Would 5% of the total parking spaces required, or a minimum of one space, whichever is greater, be provided with a listed cabinet, box or enclosure connected to a conduit linking the parking spaces with the electrical service, in a manner approved by the building and safety official, to allow for the future installation of electric vehicle supply equipment to provide electric vehicle charging stations at such time as it is needed for use by residents? • <u>Multiple-family projects of more than 17 dwelling units</u>: Would 5% of the total parking spaces required, or a minimum of one space, whichever is greater, be provided with a listed cabinet, box or enclosure connected to a conduit linking the parking spaces with the electrical service, in a manner approved by the building and safety official? Of the total listed cabinets, boxes or enclosures provided, would 50% have the necessary electric vehicle supply equipment installed to provide active electric vehicle charging stations ready for use by residents? • <u>Non-residential projects</u>: If the project includes new commercial, industrial, or other uses with the building or land area, capacity, or numbers of employees listed in Attachment A, would 6% of the total parking spaces required, or a minimum of one space, whichever is greater, be provided with a listed cabinet, box or enclosure connected to a conduit linking the parking spaces with the electrical service, in a manner approved by the building and safety official? Of the total listed cabinets, boxes or enclosures provided, would 50% have the necessary electric vehicle supply equipment installed to provide active electric vehicle charging stations ready for use? Check "N/A" only if the project is does not include new commercial, industrial, or other uses with the building or land area, capacity, or numbers of employees listed in Attachment A. A total of 1,171 parking spaces will be provided by the project; the project will provide 36 parking spaces, or 3 percent, of the project's total parking with a listed cabinet, box or enclosure connected to a conduit linking the parking spaces with the electrical service, in a manner approved by the building and safety official. Of the 36 listed cabinets, boxes, or enclosures provided, a minimum of 18 will have the necessary electric vehicle supply equipment installed to provide active electric vehicle charging stations ready for use by residents.	☐	☐	☐

Strategy 3: Bicycling, Walking, Transit & Land Use
(Complete this section if project includes non-residential or mixed uses)

5. *Bicycle Parking Spaces*

Would the project provide more short- and long-term bicycle parking spaces than required in the City's Municipal Code (Chapter 14, Article 2, Division 5)?[6]

Check "N/A" only if the project is a residential project.

N/A

☐ ☐ ☐

6. *Shower facilities*

If the project includes nonresidential development that would accommodate over 10 tenant occupants (employees), would the project include changing/shower facilities in accordance with the voluntary measures under the California Green Building Standards Code as shown in the table below?

Number of Tenant Occupants (Employees)	Shower/Changing Facilities Required	Two-Tier (12" X 15" X 72") Personal Effects Lockers Required
0-10	0	0
11-50	1 shower stall	2
51-100	1 shower stall	3
101-200	2 shower stalls	4
Over 200	2 shower stalls plus 2 additional shower stall for each 200 additional tenant-occupants	1 two-tier locker plus 1 two-tier locker for each 50 additional tenant-occupants

Check "N/A" only if the project is a residential project, or if it does not include nonresidential development that would accommodate over 10 tenant occupants (employees).

N/A

☐ ☐ ☐

[6] Non-portable bicycle corrals within 600 feet of project frontage can be counted towards the project's bicycle parking requirements.

7. *Designated Parking Spaces*

If the project includes nonresidential use, would the project provide designated parking for a combination of low-emitting, fuel-efficient, and carpool/vanpool vehicles in accordance with the following table?

Number of Nonresidential Parking Spaces Required by the Permit	Number of Designated Parking Spaces
0-9	0
10-25	2
26-50	4
51-75	6
76-100	9
101-150	11
151-200	18
201 and over	At least 10% of total

This measure does not cover electric vehicles. See Question 4 for electric vehicle parking requirements.

Note: Vehicles bearing Clean Air Vehicle stickers from expired HOV lane programs may be considered eligible for designated parking spaces. The required designated parking spaces are to be provided within the overall minimum parking requirement, not in addition to it.

Check "N/A" only if the project is a residential project.

N/A

☐ ☐ ☐

8. *Transportation Demand Management Program*

If the project would accommodate over 50 tenant-occupants (employees), would it include a transportation demand management program that would be applicable to existing tenants and future tenants that includes:

At least one of the following components:

- Parking cash out program
- Parking management plan that includes charging employees market-rate for single-occupancy vehicle parking and providing reserved, discounted, or free spaces for registered carpools or vanpools
- Unbundled parking whereby parking spaces would be leased or sold separately from the rental or purchase fees for the development for the life of the development

And at least three of the following components:

- Commitment to maintaining an employer network in the SANDAG iCommute program and promoting its RideMatcher service to tenants/employees
- On-site carsharing vehicle(s) or bikesharing
- Flexible or alternative work hours
- Telework program
- Transit, carpool, and vanpool subsidies
- Pre-tax deduction for transit or vanpool fares and bicycle commute costs
- Access to services that reduce the need to drive, such as cafes, commercial stores, banks, post offices, restaurants, gyms, or childcare, either onsite or within 1,320 feet (1/4 mile) of the structure/use?

Check "N/A" only if the project is a residential project or if it would not accommodate over 50 tenant-occupants (employees).

☐ ☐ ☐

N/A

Step 3: Project CAP Conformance Evaluation (if applicable)

The third step of the CAP consistency review only applies if Step 1 is answered in the affirmative under option B. The purpose of this step is to determine whether a project that is located in a TPA but that includes a land use plan and/or zoning designation amendment is nevertheless consistent with the assumptions in the CAP because it would implement CAP Strategy 3 actions. In general, a project that would result in a reduction in density inside a TPA would not be consistent with Strategy 3. The following questions must each be answered in the affirmative and fully explained.

1. **Would the proposed project implement the General Plan's City of Villages strategy in an identified Transit Priority Area (TPA) that will result in an increase in the capacity for transit-supportive residential and/or employment densities?**

   Considerations for this question:
   - Does the proposed land use and zoning designation associated with the project provide capacity for transit-supportive residential densities within the TPA?
   - Is the project site suitable to accommodate mixed-use village development, as defined in the General Plan, within the TPA?
   - Does the land use and zoning associated with the project increase the capacity for transit-supportive employment intensities within the TPA?

2. **Would the proposed project implement the General Plan's Mobility Element in Transit Priority Areas to increase the use of transit?**

   Considerations for this question:
   - Does the proposed project support/incorporate identified transit routes and stops/stations?
   - Does the project include transit priority measures?

3. **Would the proposed project implement pedestrian improvements in Transit Priority Areas to increase walking opportunities?**

   Considerations for this question:
   - Does the proposed project circulation system provide multiple and direct pedestrian connections and accessibility to local activity centers (such as transit stations, schools, shopping centers, and libraries)?
   - Does the proposed project urban design include features for walkability to promote a transit supportive environment?

4. **Would the proposed project implement the City of San Diego's Bicycle Master Plan to increase bicycling opportunities?**

   Considerations for this question:
   - Does the proposed project circulation system include bicycle improvements consistent with the Bicycle Master Plan?
   - Does the overall project circulation system provide a balanced, multimodal, "complete streets" approach to accommodate mobility needs of all users?

5. **Would the proposed project incorporate implementation mechanisms that support Transit Oriented Development?**

   Considerations for this question:
   - Does the proposed project include new or expanded urban public spaces such as plazas, pocket parks, or urban greens in the TPA?
   - Does the land use and zoning associated with the proposed project increase the potential for jobs within the TPA?
   - Do the zoning/implementing regulations associated with the proposed project support the efficient use of parking through mechanisms such as: shared parking, parking districts, unbundled parking, reduced parking, paid or time-limited parking, etc.?

6. **Would the proposed project implement the Urban Forest Management Plan to increase urban tree canopy coverage?**

   Considerations for this question:
   - Does the proposed project provide at least three different species for the primary, secondary and accent trees in order to accommodate varying parkway widths?
   - Does the proposed project include policies or strategies for preserving existing trees?
   - Does the proposed project incorporate tree planting that will contribute to the City's 20% urban canopy tree coverage goal?

CLIMATE ACTION PLAN CONSISTENCY CHECKLIST
ATTACHMENT A

This attachment provides performance standards for applicable Climate Action Pan (CAP) Consistency Checklist measures.

Table 1 **Roof Design Values for Question 1: Cool/Green Roofs supporting Strategy 1: Energy & Water Efficient Buildings of the Climate Action Plan**

Land Use Type	Roof Slope	Minimum 3-Year Aged Solar Reflectance	Thermal Emittance	Solar Reflective Index
Low-Rise Residential	≤ 2:12	0.63	0.75	75
	> 2:12	0.20	0.75	16
High-Rise Residential Buildings, Hotels and Motels	≤ 2:12	0.55	0.75	64
	> 2:12	0.20	0.75	16
Non-Residential	≤ 2:12	0.63	0.75	75
	> 2:12	0.20	0.75	16

Source: Adapted from the California Green Building Standards Code (CALGreen) Tier 1 residential and non-residential voluntary measures shown in Tables A4.106.5.1 and A5.106.11.2.2, respectively. Roof installation and verification shall occur in accordance with the CALGreen Code.

CALGreen does not include recommended values for low-rise residential buildings with roof slopes of ≤ 2:12 for San Diego's climate zones (7 and 10). Therefore, the values for climate zone 15 that covers Imperial County are adapted here.

Solar Reflectance Index (SRI) equal to or greater than the values specified in this table may be used as an alternative to compliance with the aged solar reflectance values and thermal emittance.

Table 2	Fixture Flow Rates for Non-Residential Buildings related to Question 2: Plumbing Fixtures and Fittings supporting Strategy 1: Energy & Water Efficient Buildings of the Climate Action Plan
Fixture Type	**Maximum Flow Rate**
Showerheads	1.8 gpm @ 80 psi
Lavatory Faucets	0.35 gpm @60 psi
Kitchen Faucets	1.6 gpm @ 60 psi
Wash Fountains	1.6 [rim space(in.)/20 gpm @ 60 psi]
Metering Faucets	0.18 gallons/cycle
Metering Faucets for Wash Fountains	0.18 gallons/cycle 20 [rim space(in.) @ 60 psi]
Gravity Tank-type Water Closets	1.12 gallons/flush
Flushometer Tank Water Closets	1.12 gallons/flush
Flushometer Valve Water Closets	1.12 gallons/flush
Electromechanical Hydraulic Water Closets	1.12 gallons/flush
Floor-mounted Urinals or Wall-mounted Urinals	0.44 or 0.11 gallons/flush

Source: Adapted from the California Green Building Standards Code (CALGreen) Tier 1 non-residential voluntary measures shown in Tables A5.303.2.3.1 and A5.106.11.2.2, respectively. See the California Plumbing Code for definitions of each fixture type.

Where complying faucets are unavailable, aerators rated at 0.35 gpm or other means may be used to achieve reduction.

Acronyms:
gpm = gallons per minute
psi = pounds per square inch (unit of pressure)
in. = inch

Table 3	Standards for Appliances and Fixtures for Commercial Application related to Question 2: Plumbing Fixtures and Fittings supporting Strategy 1: Energy & Water Efficient Buildings of the Climate Action Plan	
Appliance/Fixture Type	**Standard**	
Clothes Washers	Maximum Water Factor (WF) that will reduce the use of water by 10 percent below the California Energy Commissions' WF standards for commercial clothes washers located in Title 20 of the *California Code of Regulations.*	
Single Tank Conveyor Dishwashers	0.70 maximum gallons per rack (2.6 L) (High-Temperature)	0.79 maximum gallons per rack (4.4 L) (Low-Temperature)
Multiple Tank Conveyor Dishwashers	0.54 maximum gallons per rack (2 L) (High-Temperature)	0.54 maximum gallons per rack (2 L) (Low-Temperature)
Stationary Single Tank Door Dishwashers	0.89 maximum gallons per rack (3.4 L) (High-Temperature)	1.18 maximum gallons per rack (4.5 L) (Low-Temperature)
Undercounter-type Dishwashers	0.86 maximum gallons per rack (3.3 L) (High-Temperature)	1.19 maximum gallons per rack (4.5 L) (Low-Temperature)
Pot, Pan, and Utensil Dishwashers	0.58 maximum gallons per square foot of rack	
Single Tank Flight Type Dishwashers	GPH ≤ 2.975x + 55.00	
Multiple Tank Flight Type Dishwashers	GPH ≤ 4.96x + 17.00	
Combination Ovens	Consume no more than 1.5 gallons per hour per pan, including condensate water.	
Commercial Pre-rinse Spray Valves (manufactured on or after January 1, 2006)	Function at equal to or less than 1.6 gallons per minute (0.10 L/s) at 60 psi (414 kPa) and • Be capable of cleaning 60 plates in an average time of not more than 30 seconds per plate. • Be equipped with an integral automatic shutoff. • Operate at static pressure of at least 30 psi (207 kPa) when designed for a flow rate of 1.3 gallons per minute (0.08 L/s) or less.	

Source: Adapted from the California Green Building Standards Code (CALGreen) Tier 1 non-residential voluntary measures shown in Section A5.303.3. See the California Plumbing Code for definitions of each appliance/fixture type.

Acronyms:
L = liter
GPH = gallons per hour
X = square feet of conveyor belt/minute (max conveyor speed sf/min as tested and certified to NSF/ANSI Standard 3)
L/h = liters per hour
L/s = liters per second
psi = pounds per square inch (unit of pressure)
kPa = kilopascal (unit of pressure)

Table 4	**Size-based Trigger Levels for Electric Vehicle Charging Requirements for Non-Residential Buildings related to Question 4: Electric Vehicle Charging supporting Strategy 3: Bicycling, Walking, Transit & Land Use of the Climate Action Plan**
Land Use Type	**Size-based Trigger Level**
Hospital	500 or more beds OR Expansion of a 500+ bed hospital by 20%
College	3,000 or more students OR Expansion of a 3,000+ student college by 20%
Hotels/Motels	500 or more rooms
Industrial, Manufacturing or Processing Plants or Industrial Parks	1,000 or more employees OR 40 acres or more of land area OR 650,000 square feet or more of gross floor area
Office buildings or Office Parks	1,000 or more employees OR 250,000 square feet or more of gross floor area
Shopping centers or Trade Centers	1,000 or more employees OR 500,000 square feet or more of gross floor area
Sports, Entertainment or Recreation Facilities	Accommodate at least 4,000 persons per performance OR Contain 1,500 or more fixed seats
Transit Projects (including, but not limited to, transit stations and park and ride lots).	All

Source: Adapted from the Governor's Office of Planning and Research's (OPR's) Model Building Code for Plug-In Electric Vehicle Charging

Appendix R

Climate Action Plan Consistency Checklist
Baranek Consulting Group, Inc.,
March 2018 ~~Greenhouse Gas Analyses~~
~~Scientific Resources Associated, April 2016~~
~~HELIX Environmental, April 2013~~

CAP CONSISTENCY CHECKLIST SUBMITTAL APPLICATION

- The Checklist is required only for projects subject to CEQA review.[2]
- If required, the Checklist must be included in the project submittal package. Application submittal procedures can be found in Chapter 11: Land Development Procedures of the City's Municipal Code.
- The requirements in the Checklist will be included in the project's conditions of approval.
- The applicant must provide an explanation of how the proposed project will implement the requirements described herein to the satisfaction of the Planning Department.

Application Information

Contact Information

Project No./Name:	319435/Candlelight		
Property Address:	South of SR-905 along Caliente Avenue		
Applicant Name/Co.:	Clem Abrams		
Contact Phone:	(858) 455-5005	Contact Email:	N/A

Was a consultant retained to complete this checklist? ☐ Yes ☐ No If Yes, complete the following

Consultant Name:	Kim Baranek	Contact Phone:	858-922-8604
Company Name:	Baranek Consulting Group, Inc.	Contact Email:	kim@baranekconsulting.com

Project Information

1. What is the size of the project (acres)? 44.19 acres
2. Identify all applicable proposed land uses:
   - ☐ Residential (indicate # of single-family units):
   - ■ Residential (indicate # of multi-family units): 475 dus
   - ☐ Commercial (total square footage):
   - ☐ Industrial (total square footage):
   - ☐ Other (describe):
3. Is the project or a portion of the project located in a Transit Priority Area? ☐ Yes ■ No
4. Provide a brief description of the project proposed:

PDP, SDP and TM to build multi-family residential dwelling units and recreation areas on three lots covering 23.74 acres of site. Project proposes right-of-way and extension of Caliente Avenue, dedicated open space (including vernal pool restoration) and trails and trail access improvements. Public and private sewer and water infrastructure are proposed. The project proposes 475 units on a 23.74-acre portion of the 44.19-acre project site, with the remaining project site area consisting of open space (17.95 acres) and public roads (2.5 acres).

[2] Certain projects seeking ministerial approval may be required to complete the Checklist. For example, projects in a Community Plan Implementation Overlay Zone may be required to use the Checklist to qualify for ministerial level review. See Supplemental Development Regulations in the project's community plan to determine applicability.

CAP CONSISTENCY CHECKLIST QUESTIONS

Step 1: Land Use Consistency

The first step in determining CAP consistency for discretionary development projects is to assess the project's consistency with the growth projections used in the development of the CAP. This section allows the City to determine a project's consistency with the land use assumptions used in the CAP.

Step 1: Land Use Consistency		
Checklist Item (Check the appropriate box and provide explanation and supporting documentation for your answer)	Yes	No
A. Is the proposed project consistent with the existing General Plan and Community Plan land use and zoning designations?;[3] <u>OR</u>, B. If the proposed project is not consistent with the existing land use plan and zoning designations, and includes a land use plan and/or zoning designation amendment, would the proposed amendment result in an increased density within a Transit Priority Area (TPA)[4] and implement CAP Strategy 3 actions, as determined in Step 3 to the satisfaction of the Development Services Department?; <u>OR</u>, C. If the proposed project is not consistent with the existing land use plan and zoning designations, does the project include a land use plan and/or zoning designation amendment that would result in an equivalent or less GHG-intensive project when compared to the existing designations?	☐	☑

If "***Yes***," proceed to Step 2 of the Checklist. For question B above, complete Step 3. For question C above, provide estimated project emissions under both existing and proposed designation(s) for comparison. Compare the maximum buildout of the existing designation and the maximum buildout of the proposed designation.

If "***No***," in accordance with the City's Significance Determination Thresholds, the project's GHG impact is significant. The project must nonetheless incorporate each of the measures identified in Step 2 to mitigate cumulative GHG emissions impacts unless the decision maker finds that a measure is infeasible in accordance with CEQA Guidelines Section 15091. Proceed and complete Step 2 of the Checklist.

The project site is designated for Residential under the General Plan, Residential-Medium Density under the Otay Mesa Community Plan and is zoned RM-2-5 and RM-1-1. The 475 units proposed on the 23.74-acre portion of the site zoned for RM-2-5 results in an overall density of 20 du/ac within the 15-29 du/ac range permitted on site.

[3] This question may also be answered in the affirmative if the project is consistent with SANDAG Series 12 growth projections, which were used to determine the CAP projections, as determined by the Planning Department.

[4] This category applies to all projects that answered in the affirmative to question 3 on the previous page: Is the project or a portion of the project located in a transit priority area.

Step 2: CAP Strategies Consistency

The second step of the CAP consistency review is to review and evaluate a project's consistency with the applicable strategies and actions of the CAP. Step 2 only applies to development projects that involve permits that would require a certificate of occupancy from the Building Official or projects comprised of one and two family dwellings or townhouses as defined in the California Residential Code and their accessory structures.[5] All other development projects that would not require a certificate of occupancy from the Building Official shall implement Best Management Practices for construction activities as set forth in the Greenbook (for public projects).

Step 2: CAP Strategies Consistency			
Checklist Item (Check the appropriate box and provide explanation for your answer)	Yes	No	N/A
Strategy 1: Energy & Water Efficient Buildings			
1. *Cool/Green Roofs*. • Would the project include roofing materials with a minimum 3-year aged solar reflection and thermal emittance or solar reflection index equal to or greater than the values specified in the voluntary measures under California Green Building Standards Code (Attachment A)?; OR • Would the project roof construction have a thermal mass over the roof membrane, including areas of vegetated (green) roofs, weighing at least 25 pounds per square foot as specified in the voluntary measures under California Green Building Standards Code?; OR • Would the project include a combination of the above two options? Check "N/A" only if the project does not include a roof component. The project will include roofing materials with a minimum 3-year aged solar reflection and thermal emittance or solar reflection index equal to or greater than the values specified in the voluntary measures under the California Green Building Standards Code.	☑	☐	☐

[5] Actions that are not subject to Step 2 would include, for example: 1) discretionary map actions that do not propose specific development, 2) permits allowing wireless communication facilities, 3) special events permits, 4) use permits or other permits that do not result in the expansion or enlargement of a building (e.g., decks, garages, etc.), and 5) non-building infrastructure projects such as roads and pipelines. Because such actions would not result in new occupancy buildings from which GHG emissions reductions could be achieved, the items contained in Step 2 would not be applicable.

2. *Plumbing fixtures and fittings* With respect to plumbing fixtures or fittings provided as part of the project, would those low-flow fixtures/appliances be consistent with each of the following: Residential buildings: • Kitchen faucets: maximum flow rate not to exceed 1.5 gallons per minute at 60 psi; • Standard dishwashers: 4.25 gallons per cycle; • Compact dishwashers: 3.5 gallons per cycle; and • Clothes washers: water factor of 6 gallons per cubic feet of drum capacity? Nonresidential buildings: • Plumbing fixtures and fittings that do not exceed the maximum flow rate specified in Table A5.303.2.3.1 (voluntary measures) of the California Green Building Standards Code (See Attachment A); and • Appliances and fixtures for commercial applications that meet the provisions of Section A5.303.3 (voluntary measures) of the California Green Building Standards Code (See Attachment A)? Check "N/A" only if the project does not include any plumbing fixtures or fittings. The project will use low-flow fixtures and appliances that are consistent with this strategy.	☑	☐	☐

Strategy 3: Bicycling, Walking, Transit & Land Use			
3. *Electric Vehicle Charging* • Multiple-family projects of 17 dwelling units or less: Would 3% of the total parking spaces required, or a minimum of one space, whichever is greater, be provided with a listed cabinet, box or enclosure connected to a conduit linking the parking spaces with the electrical service, in a manner approved by the building and safety official, to allow for the future installation of electric vehicle supply equipment to provide electric vehicle charging stations at such time as it is needed for use by residents? • Multiple-family projects of more than 17 dwelling units: Of the total required listed cabinets, boxes or enclosures, would 50% have the necessary electric vehicle supply equipment installed to provide active electric vehicle charging stations ready for use by residents? • Non-residential projects: Of the total required listed cabinets, boxes or enclosures, would 50% have the necessary electric vehicle supply equipment installed to provide active electric vehicle charging stations ready for use? Check "N/A" only if the project is a single-family project or would not require the provision of listed cabinets, boxes, or enclosures connected to a conduit linking the parking spaces with electrical service, e.g., projects requiring fewer than 10 parking spaces. A total of 1,171 parking spaces will be provided by the project; the project will provide 36 parking spaces, or 3 percent, of the project's total parking with a listed cabinet, box or enclosure connected to a conduit linking the parking spaces with the electrical service, in a manner approved by the building and safety official. Of the 36 listed cabinets, boxes, or enclosures provided, a minimum of 18 will have the necessary electric vehicle supply equipment installed to provide active electric vehicle charging stations ready for use by residents.	☑	☐	☐
Strategy 3: Bicycling, Walking, Transit & Land Use (Complete this section if project includes non-residential or mixed uses)			
4. *Bicycle Parking Spaces* Would the project provide more short- and long-term bicycle parking spaces than required in the City's Municipal Code (Chapter 14, Article 2, Division 5)?[6] Check "N/A" only if the project is a residential project. N/A	☐	☑	☐

[6] Non-portable bicycle corrals within 600 feet of project frontage can be counted towards the project's bicycle parking requirements.

5. *Shower facilities*

If the project includes nonresidential development that would accommodate over 10 tenant occupants (employees), would the project include changing/shower facilities in accordance with the voluntary measures under the California Green Building Standards Code as shown in the table below?

Number of Tenant Occupants (Employees)	Shower/Changing Facilities Required	Two-Tier (12" X 15" X 72") Personal Effects Lockers Required
0-10	0	0
11-50	1 shower stall	2
51-100	1 shower stall	3
101-200	1 shower stall	4
Over 200	1 shower stall plus 1 additional shower stall for each 200 additional tenant-occupants	1 two-tier locker plus 1 two-tier locker for each 50 additional tenant-occupants

☐ ☑ ☐

Check "N/A" only if the project is a residential project, or if it does not include nonresidential development that would accommodate over 10 tenant occupants (employees).

N/A

6. *Designated Parking Spaces*

If the project includes a nonresidential use in a TPA, would the project provide designated parking for a combination of low-emitting, fuel-efficient, and carpool/vanpool vehicles in accordance with the following table?

Number of Required Parking Spaces	Number of Designated Parking Spaces
0-9	0
10-25	2
26-50	4
51-75	6
76-100	9
101-150	11
151-200	18
201 and over	At least 10% of total

This measure does not cover electric vehicles. See Question 4 for electric vehicle parking requirements.

Note: Vehicles bearing Clean Air Vehicle stickers from expired HOV lane programs may be considered eligible for designated parking spaces. The required designated parking spaces are to be provided within the overall minimum parking requirement, not in addition to it.

Check "N/A" only if the project is a residential project, or if it does not include nonresidential use in a TPA.

☐ ☑ ☐

N/A

7. *Transportation Demand Management Program*

If the project would accommodate over 50 tenant-occupants (employees), would it include a transportation demand management program that would be applicable to existing tenants and future tenants that includes:

At least one of the following components:

- Parking cash out program
- Parking management plan that includes charging employees market-rate for single-occupancy vehicle parking and providing reserved, discounted, or free spaces for registered carpools or vanpools
- Unbundled parking whereby parking spaces would be leased or sold separately from the rental or purchase fees for the development for the life of the development

And at least three of the following components:

- Commitment to maintaining an employer network in the SANDAG iCommute program and promoting its RideMatcher service to tenants/employees
- On-site carsharing vehicle(s) or bikesharing
- Flexible or alternative work hours
- Telework program
- Transit, carpool, and vanpool subsidies
- Pre-tax deduction for transit or vanpool fares and bicycle commute costs
- Access to services that reduce the need to drive, such as cafes, commercial stores, banks, post offices, restaurants, gyms, or childcare, either onsite or within 1,320 feet (1/4 mile) of the structure/use?

Check "N/A" only if the project is a residential project or if it would not accommodate over 50 tenant-occupants (employees).

☐	☑	☐

N/A

Step 3: Project CAP Conformance Evaluation (if applicable)

The third step of the CAP consistency review only applies if Step 1 is answered in the affirmative under option B. The purpose of this step is to determine whether a project that is located in a TPA but that includes a land use plan and/or zoning designation amendment is nevertheless consistent with the assumptions in the CAP because it would implement CAP Strategy 3 actions. In general, a project that would result in a reduction in density inside a TPA would not be consistent with Strategy 3.The following questions must each be answered in the affirmative and fully explained.

1. **Would the proposed project implement the General Plan's City of Villages strategy in an identified Transit Priority Area (TPA) that will result in an increase in the capacity for transit-supportive residential and/or employment densities?**

   Considerations for this question:
   - Does the proposed land use and zoning designation associated with the project provide capacity for transit-supportive residential densities within the TPA?
   - Is the project site suitable to accommodate mixed-use village development, as defined in the General Plan, within the TPA?
   - Does the land use and zoning associated with the project increase the capacity for transit-supportive employment intensities within the TPA?

2. **Would the proposed project implement the General Plan's Mobility Element in Transit Priority Areas to increase the use of transit?**

   Considerations for this question:
   - Does the proposed project support/incorporate identified transit routes and stops/stations?
   - Does the project include transit priority measures?

3. **Would the proposed project implement pedestrian improvements in Transit Priority Areas to increase walking opportunities?**

   Considerations for this question:
   - Does the proposed project circulation system provide multiple and direct pedestrian connections and accessibility to local activity centers (such as transit stations, schools, shopping centers, and libraries)?
   - Does the proposed project urban design include features for walkability to promote a transit supportive environment?

4. **Would the proposed project implement the City of San Diego's Bicycle Master Plan to increase bicycling opportunities?**

   Considerations for this question:
   - Does the proposed project circulation system include bicycle improvements consistent with the Bicycle Master Plan?
   - Does the overall project circulation system provide a balanced, multimodal, "complete streets" approach to accommodate mobility needs of all users?

5. **Would the proposed project incorporate implementation mechanisms that support Transit Oriented Development?**

   Considerations for this question:
   - Does the proposed project include new or expanded urban public spaces such as plazas, pocket parks, or urban greens in the TPA?
   - Does the land use and zoning associated with the proposed project increase the potential for jobs within the TPA?
   - Do the zoning/implementing regulations associated with the proposed project support the efficient use of parking through mechanisms such as: shared parking, parking districts, unbundled parking, reduced parking, paid or time-limited parking, etc.?

6. **Would the proposed project implement the Urban Forest Management Plan to increase urban tree canopy coverage?**

   Considerations for this question:
   - Does the proposed project provide at least three different species for the primary, secondary and accent trees in order to accommodate varying parkway widths?
   - Does the proposed project include policies or strategies for preserving existing trees?
   - Does the proposed project incorporate tree planting that will contribute to the City's 20% urban canopy tree coverage goal?

CLIMATE ACTION PLAN CONSISTENCY CHECKLIST
ATTACHMENT A

This attachment provides performance standards for applicable Climate Action Pan (CAP) Consistency Checklist measures.

Table 1 **Roof Design Values for Question 1: Cool/Green Roofs supporting Strategy 1: Energy & Water Efficient Buildings of the Climate Action Plan**

Land Use Type	Roof Slope	Minimum 3-Year Aged Solar Reflectance	Thermal Emittance	Solar Reflective Index
Low-Rise Residential	≤ 2:12	0.55	0.75	64
	> 2:12	0.20	0.75	16
High-Rise Residential Buildings, Hotels and Motels	≤ 2:12	0.55	0.75	64
	> 2:12	0.20	0.75	16
Non-Residential	≤ 2:12	0.55	0.75	64
	> 2:12	0.20	0.75	16

Source: Adapted from the California Green Building Standards Code (CALGreen) Tier 1 residential and non-residential voluntary measures shown in Tables A4.106.5.1 and A5.106.11.2.2, respectively. Roof installation and verification shall occur in accordance with the CALGreen Code.

CALGreen does not include recommended values for low-rise residential buildings with roof slopes of ≤ 2:12 for San Diego's climate zones (7 and 10). Therefore, the values for climate zone 15 that covers Imperial County are adapted here.

Solar Reflectance Index (SRI) equal to or greater than the values specified in this table may be used as an alternative to compliance with the aged solar reflectance values and thermal emittance.

Table 2	**Fixture Flow Rates for Non-Residential Buildings related to Question 2: Plumbing Fixtures and Fittings supporting Strategy 1: Energy & Water Efficient Buildings of the Climate Action Plan**
Fixture Type	**Maximum Flow Rate**
Showerheads	1.8 gpm @ 80 psi
Lavatory Faucets	0.35 gpm @60 psi
Kitchen Faucets	1.6 gpm @ 60 psi
Wash Fountains	1.6 [rim space(in.)/20 gpm @ 60 psi]
Metering Faucets	0.18 gallons/cycle
Metering Faucets for Wash Fountains	0.18 [rim space(in.)/20 gpm @ 60 psi]
Gravity Tank-type Water Closets	1.12 gallons/flush
Flushometer Tank Water Closets	1.12 gallons/flush
Flushometer Valve Water Closets	1.12 gallons/flush
Electromechanical Hydraulic Water Closets	1.12 gallons/flush
Urinals	0.5 gallons/flush

Source: Adapted from the California Green Building Standards Code (CALGreen) Tier 1 non-residential voluntary measures shown in Tables A5.303.2.3.1 and A5.106.11.2.2, respectively. See the California Plumbing Code for definitions of each fixture type.

Where complying faucets are unavailable, aerators rated at 0.35 gpm or other means may be used to achieve reduction.

Acronyms:
gpm = gallons per minute
psi = pounds per square inch (unit of pressure)
in. = inch

Table 3	**Standards for Appliances and Fixtures for Commercial Application related to Question 2: Plumbing Fixtures and Fittings supporting Strategy 1: Energy & Water Efficient Buildings of the Climate Action Plan**	
Appliance/Fixture Type	**Standard**	
Clothes Washers	Maximum Water Factor (WF) that will reduce the use of water by 10 percent below the California Energy Commissions' WF standards for commercial clothes washers located in Title 20 of the *California Code of Regulations.*	
Conveyor-type Dishwashers	0.70 maximum gallons per rack (2.6 L) (High-Temperature)	0.62 maximum gallons per rack (4.4 L) (Chemical)
Door-type Dishwashers	0.95 maximum gallons per rack (3.6 L) (High-Temperature)	1.16 maximum gallons per rack (2.6 L) (Chemical)
Undercounter-type Dishwashers	0.90 maximum gallons per rack (3.4 L) (High-Temperature)	0.98 maximum gallons per rack (3.7 L) (Chemical)
Combination Ovens	Consume no more than 10 gallons per hour (38 L/h) in the full operational mode.	
Commercial Pre-rinse Spray Valves (manufactured on or after January 1, 2006)	Function at equal to or less than 1.6 gallons per minute (0.10 L/s) at 60 psi (414 kPa) and • Be capable of cleaning 60 plates in an average time of not more than 30 seconds per plate. • Be equipped with an integral automatic shutoff. • Operate at static pressure of at least 30 psi (207 kPa) when designed for a flow rate of 1.3 gallons per minute (0.08 L/s) or less.	

Source: Adapted from the California Green Building Standards Code (CALGreen) Tier 1 non-residential voluntary measures shown in Section A5.303.3. See the California Plumbing Code for definitions of each appliance/fixture type.

Acronyms:
L = liter
L/h = liters per hour
L/s = liters per second
psi = pounds per square inch (unit of pressure)
kPa = kilopascal (unit of pressure)

Appendix S

United States Fish and Wildlife Service Biological Opinion, June 2010

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road, Suite 101
Carlsbad, California 92011

In Reply Refer To:
FWS-SDG-08B0715-08F0817

JUN 21 2010

Colonel Thomas H. Magness, IV
District Commander
U.S. Army Corps of Engineers - Los Angeles District
Regulatory Branch, Los Angeles District
P.O. Box 532711
Los Angeles, California 90053-2325

Attention: Meris Bantilan-Smith, San Diego Section

Subject: Formal Section 7 Consultation for the Candlelight Villas Project (Corps 404 File No.200501638-LAM), San Diego County, California

Dear Colonel Magness:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the proposed Candlelight Villas Project (i.e., Candlelight Villas East and Candlelight Villas West) in San Diego, San Diego County, California, and its effects on the federally endangered San Diego fairy shrimp (*Branchinecta sandiegonensis*) and Riverside fairy shrimp (*Streptocephalus woottoni*) and on the federally threatened coastal California gnatcatcher (*Polioptila californica californica*, "gnatcatcher"), in accordance with section 7(a)(2) of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq*.). Your July 13, 2005, request for formal consultation was received on July 18, 2005.

The Candlelight Villas West property is adjacent to Unit 4 of designated critical habitat for the Riverside fairy shrimp (Figure 4). Unit 4 contains vernal pools occupied by Riverside and San Diego fairy shrimp that were preserved and restored by the Sweetwater Union High School District pursuant to Service biological opinion 1-6-99-F-77. The portion of the Candlelight Villas West property adjacent to Unit 4 will be preserved and restored with additional vernal pools that will be inoculated with Riverside and San Diego fairy shrimp. The proposed vernal pool preservation and restoration will benefit Unit 4.

A 1.5-acre (ac) [0.6 hectare (ha)] portion of the Candlelight Villas East property falls within Subunit 5F of designated critical habitat for the San Diego fairy shrimp (Figure 5). The portion of the Candlelight Villas East property within Subunit 5F contains part of a vernal pool occupied by San Diego fairy shrimp, which will be preserved. In addition, the proposed project will enhance the vernal pool and restore maritime succulent scrub adjacent to the vernal pool within Subunit 5F. The proposed preservation, enhancement, and restoration will benefit Subunit 5F.

In addition to the above, the proposed project will implement conservation measures to ensure that no negative impacts to critical habitat Unit 4 and Subunit 5F will occur. Therefore, the Service has determined that the proposed project is not likely to adversely affect designated critical habitat for the Riverside or San Diego fairy shrimp, and critical habitat for these species is not addressed in the biological opinion.

The Multiple Species Conservation Program (MSCP) establishes a multiple species conservation program to minimize and mitigate habitat loss and the incidental take of covered species in association with specific activities covered by the program. The MSCP encompasses a 900-square mile (mi) [2,331-square kilometer (km)] area in southwestern San Diego County and includes the City of San Diego and 10 additional city jurisdictions, and unincorporated portions of the county. On July 18, 1997, the Service issued a section 10(a)(1)(B) permit ("incidental take permit") to the City of San Diego (City) for their Subarea Plan under the broader MSCP. The proposed project is located within the City's Subarea Plan boundary.

The gnatcatcher is a covered species under the City's Subarea Plan, and the City's incidental take permit authorizes take of gnatcatcher for projects consistent with their Subarea Plan. The Service concurs with your agency's determination that the proposed project may affect gnatcatcher. We have also determined that the project, as proposed, is consistent for impacts to gnatcatcher with the City's Subarea Plan and its associated implementation agreement and permit. Therefore, upon receipt by the project proponent, Candlelight Partners, LLC, of development approval from the City for the project, take of gnatcatcher by the Candlelight Villas East project will be authorized through the City's incidental take permit.

The status of the gnatcatcher and the effects of implementing the City's Subarea Plan under the MSCP were previously addressed in our biological opinion for the City's Subarea Plan dated June 6, 1997. In this biological opinion, we concluded that the level of anticipated take in the City's Subarea Plan area boundary was not likely to result in jeopardy to the gnatcatcher. Given that the proposed project is consistent with the City's Subarea Plan, we do not anticipate any adverse effects to the gnatcatcher that were not previously evaluated in our biological opinion for the Subarea Plan. No incidental take of gnatcatcher beyond that anticipated in the biological opinion for the City's Subarea Plan will occur. Therefore, it is our conclusion that implementation of the proposed project will not result in jeopardy to the gnatcatcher.

By this consultation, we are extending to the U.S. Army Corps of Engineers (Corps) the take coverage for gnatcatcher already provided to the City through their incidental take permit for their Subarea Plan. Extension of take coverage to the Corps under the City's Subarea Plan is limited to the action area of the proposed project as described in this biological opinion and as provided in the incidental take statement of our biological opinion for the City's Subarea Plan dated June 6, 1997. With this determination, the Corps' obligations under the Act for section 7 consultation to address impacts to gnatcatcher have been met

The project proponent is not relying on incidental take coverage for the San Diego fairy shrimp or the Riverside fairy shrimp through the City's incidental take permit and their related MSCP Subarea Plan. The impacts of this project on the San Diego fairy shrimp and the Riverside fairy shrimp are reviewed and evaluated in this biological opinion by the Service independent of and without regard to the provisions of the City's MSCP Subarea Plan or the Service's biological opinion regarding the City's MSCP Subarea Plan and associated incidental take permit.

This biological opinion is based on information provided in the *Protocol Coastal California Gnatcatcher Survey Report* (HELIX 2004a); *2004 Protocol Surveys for the San Diego and Riverside Fairy Shrimp* (HELIX 2004b and c); *Biological Technical Report for the Candlelight Villas West Project* (HELIX 2004f); *2005 Protocol Surveys for the San Diego and Riverside Fairy Shrimp* (HELIX 2005a); *Wet Season Survey Report for San Diego and Riverside Fairy Shrimp for the Bachmann Property July 15* (Helix 2005c); *Dry Season Survey Report for San Diego and Riverside Fairy Shrimp for the Bachmann Property December 15* (Helix 2005 d); *Biological Technical Report for the Candlelight Villas East Project* (HELIX 2007); *Candlelight Villas East and West On-site Vernal Pool Restoration Plan LDR No. 40329* (HELIX 2008a); *Candlelight Villas East and West On-site Habitat Management Plan LDR No. 40329* (HELIX 2008b) field investigations; *Fairy Shrimp Survey, Wet Sampling Road Ruts of Southview Subdivision and Adjacent Parcel, Otay Mesa 2007-2008 Final Comprehensive Report* (Black 2008); San Diego Fairy Shrimp (*Branchinecta sandiegonensis*) 5-Year Review: Summary and Evaluation (Service 2008a); Riverside Fairy Shrimp (*Streptocephalus woottoni*) 5-Year Review: Summary and Evaluation (Service 2008b); and other sources of information. The complete project file for this consultation is maintained at the Carlsbad Fish and Wildlife Office.

CONSULTATION HISTORY

Our knowledge of this project began in October 2004 when we received a Notice of Preparation for a Draft Environmental Impact Report (DEIR) submitted under the requirements of the California Environmental Quality Act (CEQA). We provided comments on the DEIR in November 2004. Following issuance of the 2004 DEIR we met with your agency and the previous project proponent, D. H. Horton, over the course of several months as the proposed project was refined. Our discussions during this time period addressed potential impacts to endangered species and conservation actions aimed at avoiding and minimizing these impacts.

On July 18, 2005, we received a request for formal consultation from your agency. Subsequent to receiving this request, we met with your agency and D. H. Horton several times as the proposed project was further refined. On November 17, 2005, we commented on the Corps' public notice for the project dated October 18, 2005. After additional meetings to further refine the project, in our letter dated May 17, 2006, we acknowledged initiation of formal consultation and requested additional information to complete the consultation. On October 13, 2006, Federal Judge Rudi Brewster issued a decision and Injunction Order for the *Southwest Center for Biological Diversity v. Bartel* lawsuit, which enjoined the City from processing any projects that may impact vernal pools. Extensions to the consultation were granted to allow discussions between the Service, Corps, D. H. Horton, and plaintiffs during a mediation process established by the court for the lawsuit. During this time the project was further refined to minimize impacts to vernal pools and federally listed species.

In an electronic mail transmission from Helix Environmental Planning, Inc.(HELIX) dated September 23, 2008, the Service and Corps were notified that the Candlelight Villas Project was sold and that Candlelight Partners, LLC would be the new project proponent ("Applicant"). HELIX maintained its role as environmental consultant to the new Applicant. The Service provided a draft biological opinion to the Corps in December 2009 and received comments from the Corps in March 2010. On May 17, we conferred with the Corps by phone to discuss their comments, which primarily concerned the project description as agreed to by the Applicant and Service. Upon further discussions in June 2010 between the Service and HELIX via telephone and electronic mail transmissions, the project description was clarified and agreed to by the Applicant, and where appropriate, the Service incorporated changes to this and other sections of the biological opinion as requested by the Corps.

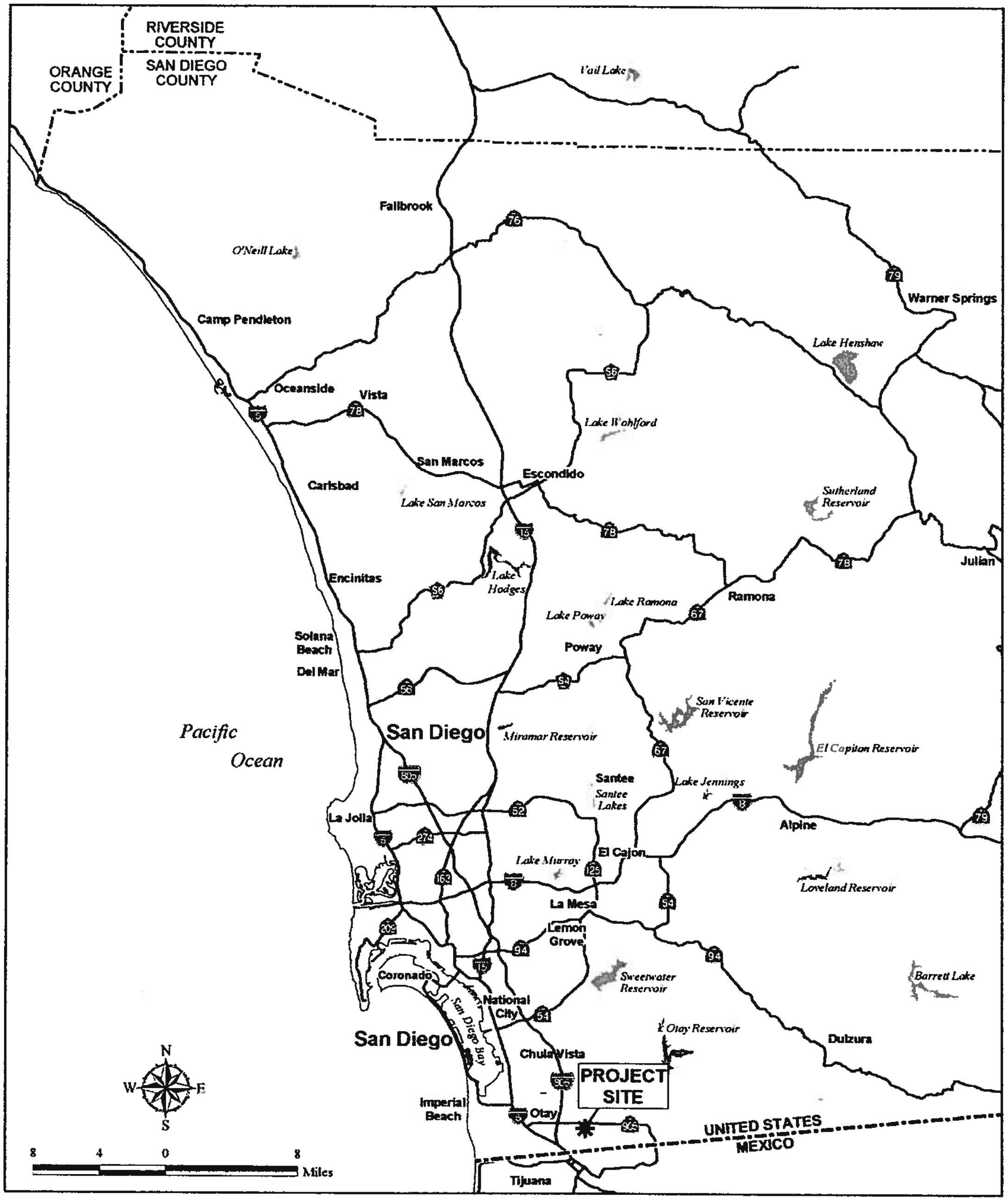
BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed action is the issuance of two permits by the Corps to Candlelight Partners, LLC under section 404 of the Clean Water Act to impact 0.47 ac (0.19 ha) of waters of the U.S. for the Candlelight Villas East Project and 0.09 ac (0.04 ha) of waters of the U.S. for the Candlelight Villas West Project. The 50-ac (20.2-ha) Candlelight Villas property is located in the Otay Mesa community 1.1 mi (1.8 km) east of Interstate 805 and 1.4 mi (2.3 km) north of the U.S./Mexico border. The Candlelight Villas East and Candlelight Villas West project sites occupy 27.3 ac (11.1 ha) and 22.7 ac (9.2 ha), respectively, of Section 31 within Township 18 South, Range 1 West of the U.S. Geological Survey 7.5-minute Imperial Beach quadrangle map (Figures 1 and 2). Approximately 2.5 ac (1.0 ha) of the Candlelight Villas property [1.1 ac (0.44 ha) in the western portion and 1.4 ac (0.56 ha) in the eastern portion] occurs within the Multi-Habitat Planning Area (MHPA), which is the City's preserve established under the MSCP.

This biological opinion addresses the Candlelight Villas East (Corps File No. SPL-2005-00044) and Candlelight Villas West (Corps File No. SPL-2010-00131) projects, which will be built in separate phases. The proposed Candlelight Villas East project comprises 431 multi-family, attached homes with associated roads, sidewalks, and internal drainage systems on 25.2 ac (10.2 ha) within Lots 1 through 3 (Figure 3). Primary access will be provided by the extension of Caliente Avenue from Otay Mesa Road, and private drives will provide internal circulation to the residential areas. A detention basin will be located on site within Parcel C of Lot 4. In addition, grading and brush management for the Candlelight Villas East are proposed on approximately 6.0 ac (2.4 ha) off site to the north and south of the property limits at Lots 1 and 2.

If approved for development, the Candlelight Villas West project will consist of a medium density residential development with approximately 15 to 29 units per acre on 6.93 ac (2.80 ha) within Parcel C of Lot 4. The entire project area for both the Candlelight Villas East and

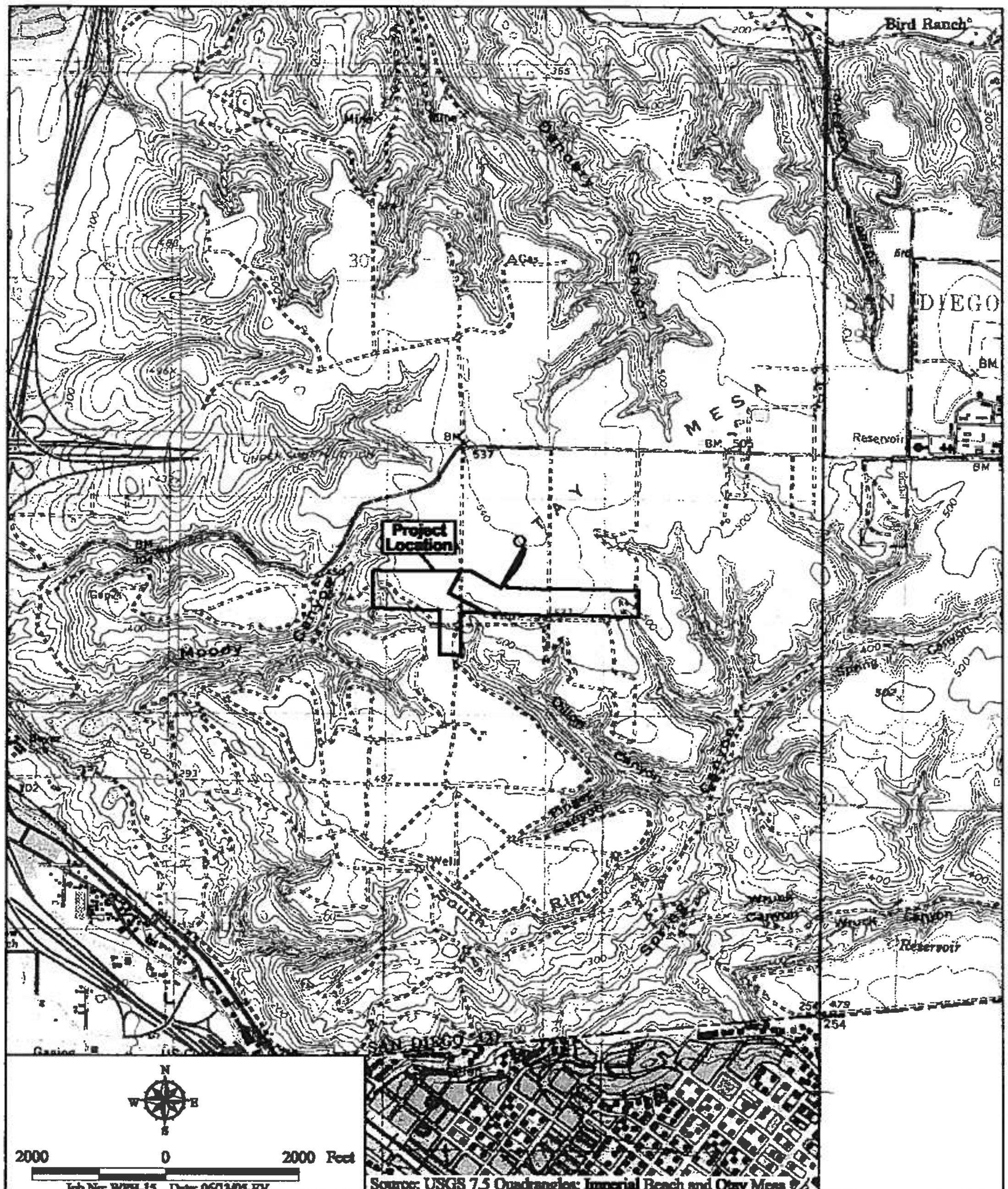


Regional Location Map

CANDLELIGHT

Figure 1

HELIX

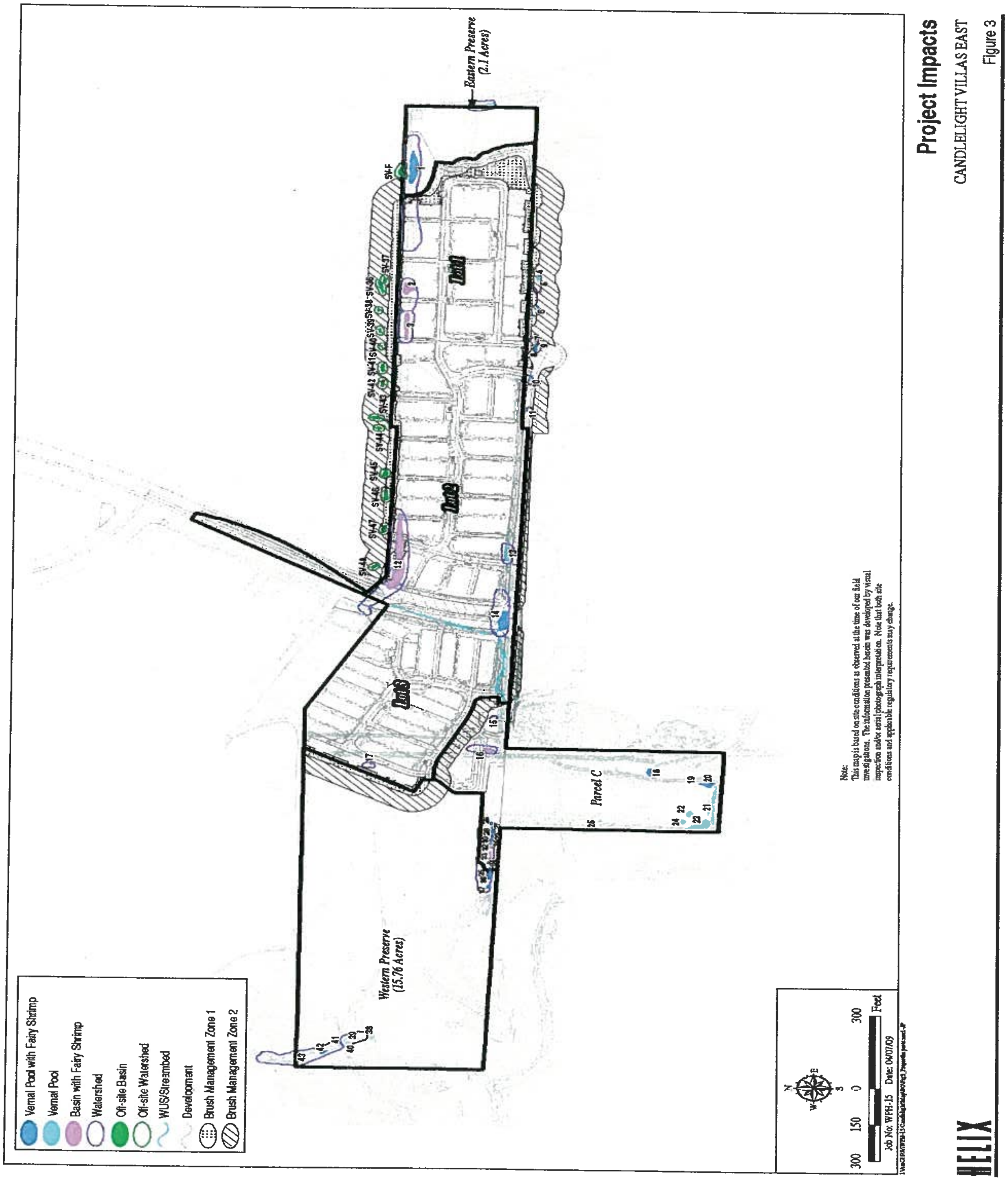


Project Location Map

CANDLELIGHT

HELIX

Figure 2


Eastern Preserve (2.1 Acres)
Western Preserve (15.76 Acres)
Parcel C
Vernal Pool with Fairy Shrimp
Vernal Pool
Basin with Fairy Shrimp
Watershed
Off-site Basin
Off-site Watershed
WUS/Streambed
Development
Brush Management Zone 1
Brush Management Zone 2
Note:
This map is based on site conditions as observed at the time of our field investigations. The information presented herein was developed by visual inspection and/or aerial photograph interpretation. Note that both site conditions and applicable regulatory requirements may change.
300 150 0 300 Feet
Job No: WFH-15 Date: 04/07/09
HELIX
Project Impacts
CANDLELIGHT VILLAS EAST
Figure 3

Candlelight Villas West projects is 56 ac (23 ha) [including the 6.0 ac (2.4 ha) off site], of which a total of 38.1 ac (15.4 ha) will be impacted and 17.86 ac (7.23 ha) will be preserved. Construction on the Candlelight Villas East phase of the project is expected to commence after the California Environmental Quality Act review is complete, and construction of Candlelight Villas West phase of the project is expected to commence no sooner than 2012.

A biological technical report for the Candlelight Villas site was prepared in 2004 and revised in 2006 and 2007 (HELIX 2007a). The report includes discussions of vegetation mapping, rare plant surveys and focused species surveys for fairy shrimp (Table 1). Based on aerial photographs dating back to 1928, the flat portions of the entire project site, like most of Otay Mesa, appear to have historically supported vernal pool habitat. All vernal pools remaining on site (including those referred to in the biological technical report as "road pools") have been disturbed by past agricultural activities, ongoing off-road vehicle use, and border patrol activities. As a result of these activities, the vernal pools exhibit low diversity and cover of vernal pool indicator plant species and cover and are predominated by nonnative grasses and forbs; the road pools are devoid of any vegetation. The Candlelight properties and offsite impact areas currently support a total of 0.51 ac (0.21 ha) of vernal and road pools (Table 1).

Table 1
EXISTING VEGETATION COMMUNITIES (acre[s])*

Vegetation Communities	Candlelight Villas East		Candlelight Villas West	Total
	On Site	Off Site		
Wetland/Riparian Habitats				
Disturbed wetland	0.02			0.02
Vernal pool	0.1	0.03	0.09	0.22
Road pool	0.22	0.05	0.02	0.29
Upland Vegetation Communities				
Maritime succulent scrub (Tier I)	0.72	0	5.09	5.81
Nonnative grassland (Tier IIIB)	20.65	2.3	14.22	37.17
Other Areas				
Eucalyptus woodland (Tier IV)	0.48	0	0.18	0.66
Disturbed habitat (Tier IV)	5.09	3.7	3.09	11.8
TOTAL	**27.28**	**6**	**22.69**	**55.97**

*Upland habitats are rounded to the nearest 0.1 acre, while wetland habitats are rounded to the nearest 0.01; thus, totals reflect rounding

Surveys detected San Diego fairy shrimp in a total of 23 pools on the Candlelight properties and the offsite impact areas (HELIX 2004a and b, HELIX 2005a, c, and d) (Table 2). In addition, Riverside fairy shrimp was detected in 1 of the 23 pools occupied by San Diego fairy shrimp. No listed fairy shrimp species were detected in pools that will be subject to fuel modification to the north on the Southview property (Black 2008).

Impacts

Implementation of the Candlelight Villas East and Candlelight Villas West projects will impact a total of 50 pools with a combined surface area of 0.5 ac (0.2 ha) [i.e., 30 pools with a combined

TABLE 2 CANDLELIGHT VILLAS EAST AND WEST SUMMARY OF IMPACTS TO VERNAL AND ROAD POOLS ON AND OFF SITE					
Basin No.	**Type**	**Impacted**	**Approximate Area (sq ft)**	**Fairy Shrimp**	**Location**
Candlelight Villas East (including Off site)					
1	**Vernal pool**	**Yes**	**2415**	**SD****	**On site**
2	**Road pool**	**Yes**	**1010**	**SD**	**On site**
3	**Road pool**	**Yes**	**1001**	**SD**	**On site**
4	Vernal pool	Yes*	23	--	Off site
5	Vernal pool	Yes*	374	--	Off site
6	Vernal pool	Yes*	196	--	Off site
7	Vernal pool	Yes	14	--	Off site
8	**Vernal pool**	**Yes**	**327**	**SD**	**Off site**
9	Vernal pool	Yes	24	--	Off site
10	Vernal pool	Yes	128	--	Off site
11	Vernal pool	Yes	26	--	Off site
12	**Road pool**	**Yes**	**7442**	**SD, RS*****	**On site**
13	Vernal pool	Yes	524	--	On site
14	**Vernal pool**	**Yes**	**1533**	**SD**	**On site**
15	Vernal pool	Yes	10	--	On site
16	**Road pool**	**Yes**	**488**	**SD**	**On site**
17	**Road pool**	**Yes**	**33**	**SD**	**On site**
SV-36	Road pool	Yes*	301	--	Off site
SV-37	Road pool	Yes*	122	--	Off site
SV-38	Road pool	Yes*	46	--	Off site
SV-39	Road pool	Yes*	68	--	Off site
SV-40	Road pool	Yes*	19	--	Off site
SV-41	Road pool	Yes*	196	--	Off site
SV-42	Road pool	Yes*	197	--	Off site
SV-43	Road pool	Yes*	212	--	Off site
SV-44	Road pool	Yes*	121	--	Off site
SV-45	Road pool	Yes*	191	--	Off site
SV-46	Road pool	Yes*	323	--	Off site
SV-47	Road pool	Yes*	253	--	Off site
SV-48	Road pool	Yes*	122	--	Off site
Subtotal impacts to all East pools		**30 pools**	**17,738 sq ft (0.41 ac)**		
Subtotal impacts to East SD fairy shrimp pools		**8 pools**	**14,249 sq ft (0.33 ac)**		
Subtotal impacts to East RS fairy shrimp pools		**1 pool**	**7,442 sq ft (0.17 ac)**		
Candlelight Villas West					
18	**Vernal pool**	**Yes**	**419**	**SD**	**On site**
19	Vernal pool	Yes	20	--	On site
20	**Vernal pool**	**Yes**	**456**	**-SD-**	**On site**
21	Vernal pool	Yes	26	--	On site
22	Vernal pool	Yes	387	--	On site

23	Vernal pool	Yes	1088	--	On site
24	Vernal pool	Yes	151	--	On site
25	Vernal pool	Yes	33	--	On site
26	**Vernal pool**	**Yes**	**73**	**SD**	**On site**
27	**Vernal pool**	**Yes**	**49**	**SD**	**On site**
28	**Vernal pool**	**Yes**	**151**	**SD**	**On site**
29	**Vernal pool**	**Yes**	**121**	**SD**	**On site**
30	**Vernal pool**	**Yes**	**107**	**SD**	**On site**
31	**Road pool**	**Yes**	**112**	**SD**	**On site**
32	**Road pool**	**Yes**	**125**	**SD**	**On site**
33	**Road pool**	**Yes**	**146**	**SD**	**On site**
34	**Vernal pool**	**Yes**	**108**	**SD**	**On site**
35	**Vernal pool**	**Yes**	**247******	**SD**	**On site**
36	**Vernal pool**	**Yes***	**87**	**SD**	**On site**
37	**Vernal pool**	**Yes***	**62**	**SD**	**On site**
38	Vernal pool	No	58	--	On site
39	Vernal pool	No	30	--	On site
40	Vernal pool	No	27	--	On site
41	Vernal pool	No	62	--	On site
42	Vernal pool	No	157	SD	On site
43	Vernal pool	No	93	--	On site
Subtotal impacts to all West pools		**20 pools**	**3,942 sq ft (0.09 ac)**		
Total impacts to all pools		**50 pools**	**21,680 sq ft (0.5 ac)**		
Subtotal impacts to West SD fairy shrimp pools		**14 pools**	**2,263 sq ft (0.05 ac)**		
Subtotal impacts to West RS fairy shrimp pools			**0 sq ft (0 ac)**		
Total impacts to SD fairy shrimp pools		**22 pools**	**16,512 sq ft (0.38 ac)**		
Total impacts to RS fairy shrimp pools		**1 pool**	**7,442 sq ft (0.17 ac)**		

* fuel modification and indirect impacts only
** San Diego
*** Riverside
**** While only part of Pool 35 will be directly impacted (i.e., 60 sq ft), the entire pool has been assessed as impacted because a substantial portion of the pool's watershed will also be impacted and the entire pool will be subject to fuel modification activities. Therefore, the action area contains 56 pools that total 22,107 sq ft (0.51 ac). Six (6) vernal pools [Pools 38-43; 426 sq ft (0.009 ac) total] will not be impacted, including 1 vernal pool with San Diego fairy shrimp [Pool 42; 157 sq ft (0.004 ac)]

surface area of 0.41 ac (0.16 ha) at the Candlelight Villas East project site, and 20 pools with a combined surface area of 0.09 ac (0.04 ha) at the Candlelight Villas West project site] (Tables 2 and 3). Of these, a total of 22 pools with a combined surface area of 0.38 ac (0.15 ha) [i.e., 8 pools with a combined surface area of 0.33 ac (0.13 ha) at the Candlelight Villas East project site, and 14 pools with a combined surface area of 0.05 ac (0.02 ha) at the Candlelight Villas West project site] are occupied by the San Diego fairy shrimp, and 1 pool [i.e., Pool 12 with a surface area of 0.17 ac (0.07 ha)] is occupied by Riverside fairy shrimp as well. Vernal Pools 1, 4, 5, 6, 36, and 37, which are occupied by San Diego fairy shrimp, will not be directly impacted by grading, but impacts have been assessed to these vernal pools because a large portion of their watersheds will be directly impacted and/or they will be subject to fuel modification activities.

TABLE 3
CANDLELIGHT PROPERTY
IMPACTS TO JURISDICTIONAL AREAS/SENSITIVE SPECIES (acre)

JURISDICTIONAL AREAS/SPECIES	Candlelight Villas East (including off site)	Future Candlelight Villas West	Total Impacts
Vernal/Road pools supporting San Diego fairy shrimp	0.16	0.05	0.21
Road pools supporting Riverside/San Diego fairy shrimp	0.17	--	0.17
Subtotal for fairy shrimp pools	**0.33**	**0.05**	**0.38**
Vernal pools with no listed fairy shrimp	0.08	0.04	0.12
Disturbed wetland	0.02	--	
Non-wetland Waters of the U.S./Streambed*	0.04	--	0.06
Total	**0.47**	**0.09**	**0.56**

*Impacts offset with vernal pool habitat (higher quality wetland)

The project site was evaluated for the presence of waters of the U.S. Wetland boundaries were determined using the three criteria (hydrophytic vegetation, hyric soils and hydrology) required by the Corps. The Candlelight Villas Project will affect approximately 0.56 ac (0.23 ha) of aquatic habitats regulated by the Corps (Table 3, Figure 3).

According to 50 CFR § 402.02 pursuant to section 7 of the Act, the "action area" includes all areas to be affected directly or indirectly by the Federal action. Areas directly impacted include all areas within the project footprint, including construction vehicle access routes, staging areas, and grading areas. Habitat immediately adjacent to the project footprint may be indirectly impacted or degraded by construction activities or later in time due to the developed nature of the road. Thus, we have defined the action area for the proposed project to be 56 ac (23 ha) encompassing the Candlelight Villas East and Candlelight Villas West properties [50 ac (20 ha)] and the offsite impact area [6.0 ac (2.4 ha)] (Figure 1). Subsequent analyses of the environmental baseline, effects of the action, and levels of incidental take are based upon the action area.

Conservation Measures

The proposed action contains the following conservation measures that will be implemented as part of the project in order to avoid, minimize, and offset potential adverse effects of the action on San Diego fairy shrimp and Riverside fairy shrimp.

The Candlelight Villas East and Candlelight Villas West projects will include onsite preservation/enhancement of 0.07 ac (0.03 ha) of vernal and road pools and restoration of 1.16 ac (0.65 ha) of vernal pools (Table 4; Figures 3, 4 and 5). All restored pools, and enhanced pools as appropriate, will be planted with vernal pool indicator plant species and inoculated with San Diego and/or Riverside fairy shrimp. However, only 0.96 ac (0.39 ha) of the restored pools will be required to support reproducing San Diego and/or Riverside fairy shrimp populations. A surplus of 0.13 ac (0.05 ha) of vernal pools will be restored to provide a contingency in case some pools do not attain the identified final success criteria. In addition, the pool watersheds and surrounding uplands will be restored with maritime succulent scrub within a 15.76-ac (6.38-ha) western (Figures 3 and 4) and 2.1-ac (0.85-ha) eastern (Figure 5) preserve.

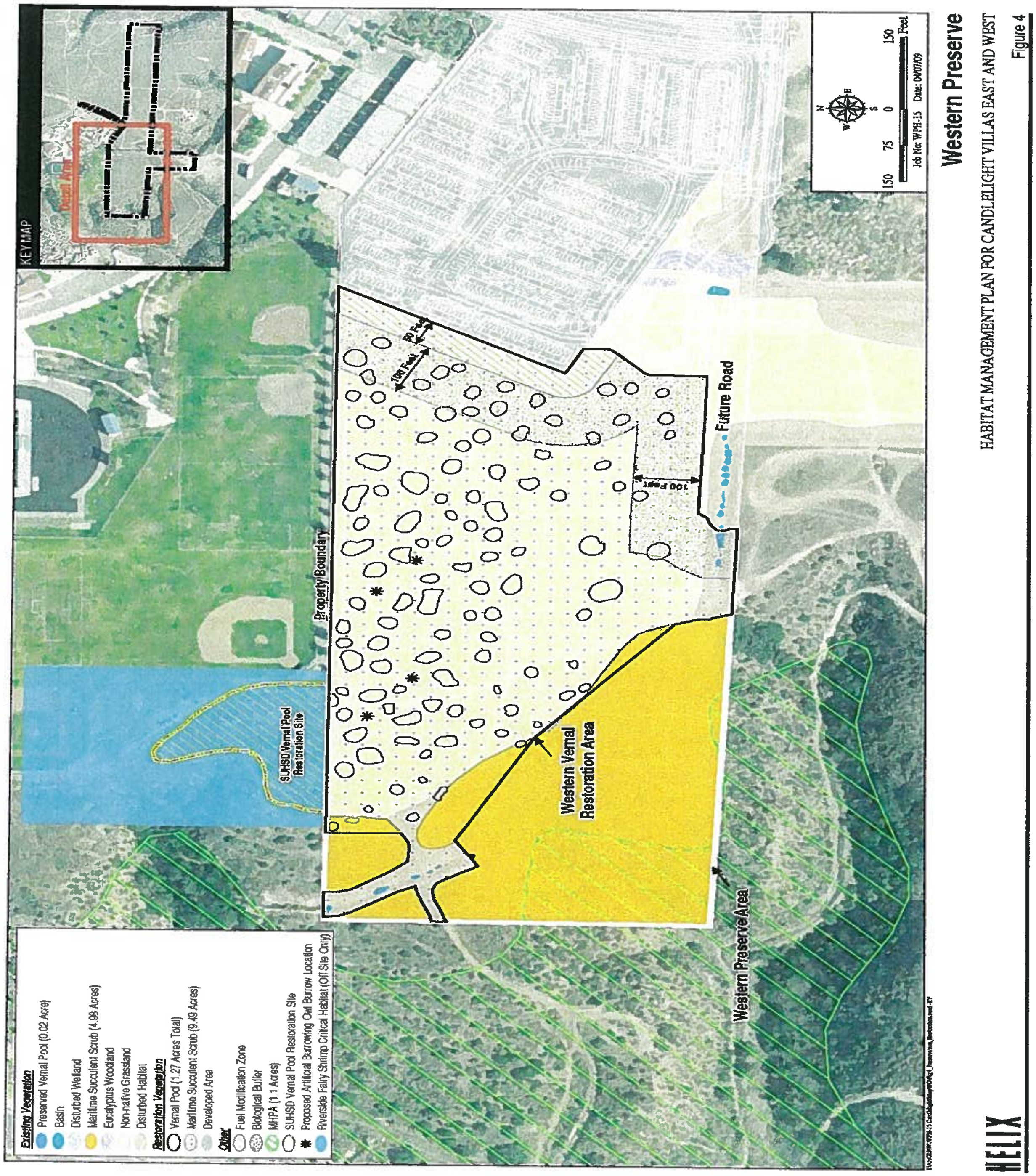
TABLE 4
CANDLELIGHT PROPERTY
VERNAL/ROAD POOL
CONSERVATION AND IMPACTS (acre)

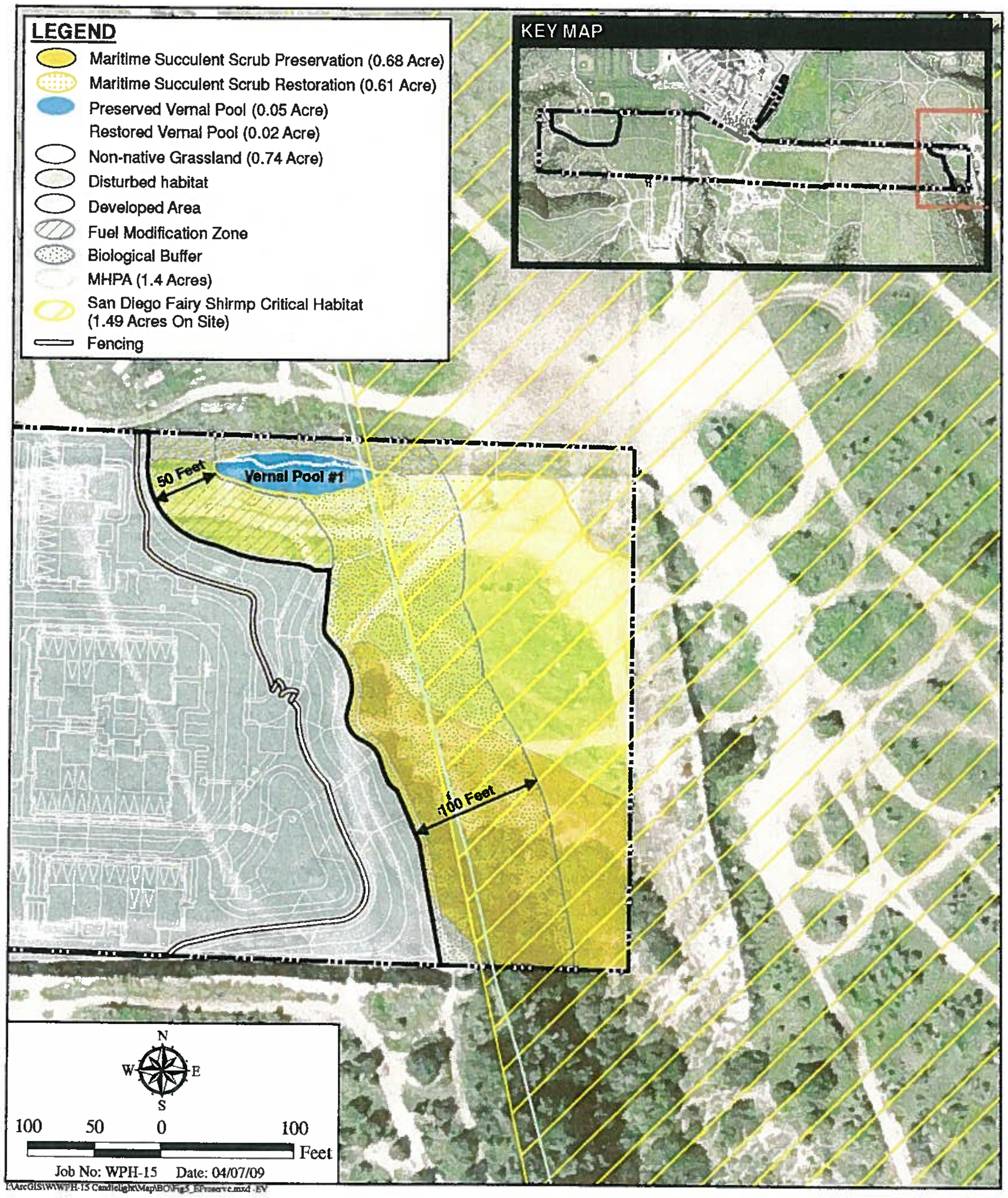
JURISDICTIONAL AREAS/SPECIES	Impacts	Total Conservation	Preservation/ Enhancement	Restoration
Vernal/Road pools supporting listed fairy shrimp	0.38	1.02	0.06	0.96
Vernal pools with no listed fairy shrimp	0.12	0.21	0.01	0.2
Total	**0.50**	**1.23**	**0.07**	**1.16**

Upon project completion, preserved onsite open space will total approximately 17.86 ac (7.23 ha) (Table 5). The 15.76-ac (6.38-ha) western preserve is bounded on the north by the Sweetwater Union High School District vernal pool restoration site and San Ysidro High School and to the west by the MHPA (Figure 4). Approximately 1.1 ac (0.45 ha) of the western preserve will be within the MHPA.

The western preserve will include most of the vernal pool restoration/enhancement for the Candlelight Villas East project and, if approved, the future Candlelight Villas West project, including enhancement of vernal pools 35 through 43.

The 2.1-ac (0.85-ha) eastern preserve will be located at the east end of the Candlelight Villas East project site (Figures 3 and 5). Approximately 1.5 ac (0.61 ha) of the eastern preserve will be within the MHPA and designated critical habitat for the San Diego fairy shrimp (which share the same footprint on the Candlelight property); and the rest of the eastern preserve will be adjacent to these areas (Figure 5). Vernal pool 1 and its surrounding uplands in the eastern preserve will be enhanced to improve the likelihood that this pool is sustained over the long term. Enhancement activities will include removing trash, debris, and failing berm to the north of the pool, and restoring maritime succulent scrub in the upland adjacent to the pool (Figure 5). Removing the berm will restore the natural watershed of the pool, including areas to the north, on the adjacent Southview property, and create approximately 0.02 ac (0.01 ha) of additional vernal pool surface area, increasing the size of this vernal pool to 0.07 ac (0.03 ha). The proposed maritime succulent scrub restoration will extend into the MHPA and designated critical habitat for the San Diego fairy shrimp. No construction activity will occur within the preserved vernal pool itself.


Western Preserve
HABITAT MANAGEMENT PLAN FOR CANDLELIGHT VILLAS EAST AND WEST
Figure 4
KEYMAP
Property Boundary
Future Road
50 Feet
100 Feet
100 Feet
Western Vernal Restoration Area
SUHSD Vernal Pool Restoration Site
Western Preserve Area
Existing Vegetation
Preserved Vernal Pool (0.02 Acre)
Basin
Disturbed Wetland
Maritime Succulent Scrub (4.98 Acres)
Eucalyptus Woodland
Non-native Grassland
Disturbed Habitat
Restoration Vegetation
Vernal Pool (1.27 Acres Total)
Maritime Succulent Scrub (9.49 Acres)
Developed Area
Other
Fuel Modification Zone
Biological Buffer
MHPA (11 Acres)
SUHSD Vernal Pool Restoration Site
Proposed Artificial Burrowing Owl Burrow Location
Riverside Fairy Shrimp Critical Habitat (Off Site Only)
150 75 0 150 Feet
Job No: WPH-15 Date: 04/07/09
HELIX



Eastern Preserve

HABITAT MANAGEMENT PLAN FOR CANDLELIGHT VILLAS EAST AND WEST

HELIX

Figure 5

TABLE 5
VEGETATION COMMUNITIES WITHIN THE PRESERVE AREAS (acre[s])

Vegetation Community	Western Preserve	Eastern Preserve	Total
Vernal pools restored	1.27*	0.02	1.29
Vernal pools preserved/enhanced	0.02	0.05	0.07
Maritime succulent scrub preserved	4.98	0.68	5.66
Maritime succulent scrub restored	9.49	0.61	10.1
Nonnative grassland preserved		0.74	0.74
TOTAL	15.76	2.1	17.86

***includes 0.13 acre of contingency vernal pools**

1. Impacts to 22 vernal/road pools [0.38 ac (0.15 ha)] occupied by San Diego and/or Riverside fairy shrimp, and 28 vernal/road pools [0.12 ac (0.05 ha)] not occupied by fairy shrimp (Table 2), will be offset by: (a) enhancement/preservation of 10 vernal pools [i.e., Vernal Pools 1 and 35 to 43; 0.07 ac (0.03 ha)]; and (b) restoration/ preservation of approximately 111 [1.16 ac (0.47 ha)] vernal pools in the western preserve: approximately 75 [0.64 ac (0.26 ha)] and 17 [0.32 ac (0.13 ha)] of the restored vernal pools will support San Diego and Riverside fairy shrimp, respectively. An extra 0.13 ac (0.05 ha) of vernal pools will be restored to provide a contingency surplus.

   Vernal pool enhancement, restoration and preservation will occur in two areas on site; a 15.76-ac (6.38-ha) area in the western portion of the site, and a 2.1-ac (0.85-ha) area in the eastern portion of the site (Figures 4 and 5). A total of 111 vernal pools with a combined surface area of approximately 1.16 ac (0.47 ha) will be restored, and 9 vernal pools with a combined surface area of 0.02 ac (0.01 ha) will be preserved/enhanced in the western preserve (Tables 4 and 5; Figures 4 and 5). The existing 0.05 ac (0.02 ha) vernal pool in the eastern preserve will be enhanced and expanded to 0.07 ac (0.03 ha) (VP 1; Figure 6). In addition, a total of 15.76 ac (6.38 ha) of maritime succulent scrub will be preserved [5.66 ac (2.29 ha)] and restored [10.1 ac (4.09 ha)] in the preserves (Table 5).

2. The entire Candlelight Villas Project (i.e., East and West) will be phased so that the up to 20 pools [0.09 ac (0.04 ha)], including 14 pools [0.05 ac (0.02 ha)] occupied by the San Diego fairy shrimp, within the Candlelight Villas West footprint (Table 2) will not be impacted until the vernal pool restoration/enhancement for the entire project has been implemented for at least 2 years and shown to meet identified final success criteria, unless prevented from meeting such criteria due to lack of sufficient rainfall.

3. The project proponent will submit a final vernal pool restoration/enhancement plan to the Corps and Service (Agencies) for approval at least 60 days prior to initiating project impacts. Project impacts may not occur until the Agencies have approved the final plan. The final plan will be based on the Candlelight Villas East and Candlelight Villas West

Onsite Vernal Pool Restoration Plan LDR No. 40329 (HELIX 2008a). In addition to the measures proposed in the draft plan, the final plan will include the following information:

a) Implementation of the final plan will be conducted under the direction of a qualified biologist (vernal pool restoration specialist) with at least 3 years of vernal pool restoration experience; the biologist will be approved by the Agencies;

b) The restoration area contains extant vernal pools and is immediately adjacent to the successful Sweetwater Union High School District vernal pool preservation and restoration area. To avoid impacts to these vernal pools, all measures required at the project construction site to avoid and minimize impacts to adjacent vernal pools and their watersheds (see Conservation Measure 11) will also be implemented at the restoration site and thus specified in the restoration plan;

c) All vernal pools to be avoided and their watersheds (i.e., Vernal Pools 1 and 35 to 43) will be enhanced, as appropriate, to achieve the same success criteria as the restored pools and surrounding uplands. Enhancement activities will include addition of vernal pool plant species, inoculation of unoccupied pools with San Diego fairy shrimp, as appropriate, and addition of maritime succulent scrub plant species in the surrounding uplands as shown on Figures 4 and 5;

d) All restoration/enhancement activities will commence the first summer-fall season prior to or concurrently with the start of construction of Candlelight Villas East project;

e) All final specifications and topographic-based grading, planting and watering plans will have 0.5-foot (ft) [0.15-meter (m)] contours and show typical cross-sections for the vernal pools, watersheds and surrounding uplands (including adjacent mima mounds) at the restoration/enhancement sites. The basis for this fine-scale resolution is the shallow depth (i.e., several inches) of the vernal pools that will be restored/enhanced. The grading plans will also show overflow pathways that hydrologically connect the restored pools in a way that mimics natural vernal pool complex topography/hydrology. Grading of the western vernal pool restoration/enhancement site, and additional measures as needed, will prevent runoff from the high school property from entering the site;

f) A fine-scale, detailed hydraulic analysis that shows each proposed vernal pool and its watershed, and hydrologic connection between the pools. The watersheds of the restored pools will be contained on site and will not extend into the adjacent high school property and vernal pool restoration site (except where it can be demonstrated that no impacts to the watersheds of vernal pools in the high school restoration site will occur);

g) As a last resort and after approval by the Agencies, additional inoculum from offsite donor vernal pools in the Otay mesa area may be used to supplement the inoculum collected on site. The final plan will identify any proposed offsite donor pools and include documentation that they are free of versatile fairy shrimp (*Branchinecta lindahli*). No more than 10 percent of the basin area of any donor pool will be used for collection of inoculum. Collection of inoculum from Agency-approved offsite donor pools will be consistent with Conservation Measure 4;

h) Inoculum and planting will not be installed until the Agencies have approved the habitat restoration site grading. All planting will be installed in a way that mimics natural plant distribution and not in rows. Inoculum will not be introduced into the restored or enhanced pools until after they have been demonstrated to retain water for the appropriate amount of time to support San Diego fairy shrimp [i.e., at least 30 days (Hathaway and Simovich 1996, Ripley et. al. 2004)] or Riverside fairy shrimp [i.e., at least 60 days (Hathaway and Simovich 1996)] and have been surveyed for versatile fairy shrimp to the satisfaction of the Agencies. If versatile fairy shrimp are detected in the restored pools, inoculum will not be introduced until measures approved by the Agencies are implemented in attempt to remove the versatile fairy shrimp from the pools. Inoculum will be placed in a manner that preserves, to the maximum extent possible, the orientation of the fairy shrimp cysts within the surface layer of soil (e.g., collected inoculum will be shallowly distributed within the pond so that cysts have the potential to be brought into solution upon inundation);

i) Plant palettes (species, size and number/acre) and seed mix (species and pounds/acre) will be included in the restoration/enhancement plan. The plant palette will include native species specifically associated with the onsite habitat type(s). If native plant species (no cultivars) cannot be obtained within Otay Mesa, an alternate site will be used only upon approval by the Agencies. The source and proof of local origin of all plant material and seed will be provided to the Agencies;

j) Native plants and animals will be established within the restored/enhanced pools, their watersheds and surrounding uplands. This can be accomplished by redistributing topsoil containing seeds, spores, bulbs, eggs, and other propagules from affected pools and adjacent vernal pool and upland habitats; by the translocation of propagules of individual species from offsite habitats; and by the use of commercially available native plant species; any vernal pool inoculum or plant material from an offsite source will be approved by the Agencies. Topsoil and plant materials from the native habitats to be affected on site will be applied to the watersheds of the enhanced and restored pools to the maximum extent practicable. Exotic weed control will be implemented within the restoration areas to protect and enhance habitat remaining on site;

k) Any artificial watering of the restored/enhanced pool watersheds will be done in a manner that prevents water from entering into the pools. Any water to be used will be identified and documented to be free of contaminants that could affect the water quality of the pools and harm fairy shrimp;

l) All weeding within and immediately adjacent to the restored/enhanced pools will be performed by hand. No herbicide will be used within the restored and preserved vernal pools. Herbicide may be used in the uplands adjacent to pools only as approved by the Agencies (e.g., using the "glove" method). All workers conducting weed removal activities will be educated to distinguish between native and nonnative species so that local native plants are not inadvertently killed by weed removal activities;

m) A final implementation schedule that indicates when all vernal/road pool impacts (including phased impacts required by Conservation Measure 2) and vernal pool restoration/enhancement grading and planting will begin and end. Any temporal loss of vernal and/or road pools or upland habitat caused by delays in restoration will be offset by additional habitat preservation and/or restoration unless the delays were caused by unforeseeable circumstances or were beyond the reasonable control of the project proponent as determined in coordination with the Agencies;

n) A minimum commitment to 5 years of monitoring of vernal pool and upland habitat restoration/enhancement areas. The final success criteria methodology will include quantitative hydrological, vegetation transects, viable cyst, hatched fairy shrimp, and gravid female measurements; complete floral and fauna inventories; and photographic documentation. To minimize impacts to the vernal pool's soil surface during restoration, enhancement and monitoring activities, cobbles will be oriented within the restored vernal pools to serve as stepping stones;

o) Approximately 75 [0.64 ac (0.26 ha)] and 17 [0.32 ac (0.13 ha)] of the restored vernal pools will support San Diego fairy shrimp and Riverside fairy shrimp, respectively. Restoration success, as determined by the final success criteria, for San Diego fairy shrimp and Riverside fairy shrimp will be determined by measuring the ponding of water and density of viable cysts, hatched fairy shrimp, and gravid females within the restored pools. Water measurements will be taken in the restored pools to determine the depth, duration and quality (e.g., pH, temperature, total dissolved solids, salinity) of ponding. Dry samples will be taken in the restored pools to determine the density of viable cysts in the soils. Wet samples will also be taken in the restored pools to determine the density of hatched fairy shrimp and gravid females. Final success criteria will be set such that the pools must pond for a period of time similarly to reference vernal pools during an average rainfall year and at an appropriate depth and quality to support fairy shrimp. The average viable cyst, hatched fairy shrimp, and gravid female density of the restored pools must not differ significantly ($p < 0.05$) from reference pools for, at least, 3 wet seasons before a determination of success can be made. Vernal pools selected as reference or control pools for evaluating restoration success will be identified and described in the restoration plan. Alternate methods of determining success will only be used if approved by the Agencies;

p) Monitoring and success criteria for vernal pool and upland restoration/enhancement areas will include: maritime succulent scrub species richness and cover criteria for all 5 years of monitoring; 0 percent cover for weed species categorized as High or Moderate in the California Invasive Plant Council's (Cal-IPC) Invasive Plant Inventory and relative cover of all other weed species is no more than 5 percent coverage for other exotic/weed species for all 5 years of the 5-year monitoring period. Container plant survival will be 80 percent of the initial plantings for the first 5 years. At the first and second anniversary of plant installation, all dead plants will be replaced unless their function has been replaced by natural recruitment. The method used for monitoring will be described and a map of proposed sampling locations will be included. Photo points will be used for qualitative monitoring and stratified-random sampling will be used for all quantitative surveys;

q) A commitment by the project proponent agreeing that restoration/enhancement of San Diego fairy shrimp and Riverside fairy shrimp habitat will be deemed complete once the final success criteria are met and only after written sign-off by the Agencies. Specifically, if a performance criterion is not met for any of the restored/enhanced vernal pools or upland habitat in any year, or if the final success criteria are not met, the project proponent will prepare an analysis of the cause(s) of failure and, if deemed necessary by the Agencies, propose remedial actions for approval. If any of the restored/enhanced vernal pools or upland habitat have not met a performance criterion during the initial 5-year period, the project proponent's maintenance and monitoring obligations will continue until the Agencies deem the restoration/enhancement successful, or contingency measures are implemented. Restoration/enhancement will not be deemed successful until at least 2 years after any contingency measures are implemented, as determined by the Agencies; and

r) Annual reports will be submitted to the Agencies by January 31 of each year. Those reports will assess both the attainment of yearly success criteria and progress toward the final success criteria. The reports will also summarize the project's compliance with the conservation measures committed to as part of the Candlelight Villas Project, terms and conditions included in the biological opinion, and Corps permit conditions.

4. Prior to project construction of the east and west phase, the project proponent will temporarily fence (with silt barriers) the limits of project impacts (including construction staging areas and access routes) to prevent additional habitat impacts and prevent the spread of silt from the construction zone into avoided adjacent areas. The entire impact limits will be fenced with silt fencing and/or orange construction fencing that will be maintained throughout the construction period to preclude human entry into vernal pool watersheds, MHPA, and/or other open space areas. Fencing will be installed in a manner that does not impact avoided habitats or vernal pool hydrology. No construction activities, materials, or equipment will be permitted outside the fenced project footprint. The project proponent will submit to the Agencies for approval, at least 7 days prior to initiating project construction for each phase, final construction plans that include photographs of the fenced limits of impact and all areas to be impacted or avoided. If work occurs beyond the fenced limits of impact, all work will cease until the problem has been remedied to the satisfaction

of the Agencies. Any impacts to riparian/wetland, upland habitat, and habitat for San Diego fairy shrimp or other federally listed species that occur beyond the approved fenced area will be offset as approved by the Agencies. Temporary construction fencing will be removed upon project completion.

5. Prior to project construction for each phase, topsoil will be salvaged from the vernal/road pools to be impacted on site. Vernal pool soil (inoculum) will be collected when dry to avoid damaging or destroying fairy shrimp cysts. Hand tools (i.e., shovels and trowels) will be used to remove the top 2 inches (in) [5.1 centimeters (cm)] of soil from the pools. Whenever possible, the trowel will be used to pry up intact chunks of soil, rather than loosening the soil by raking and shoveling, which can damage the cysts. The soil from each pool will be stored individually in labeled boxes that are adequately ventilated and kept out of direct sunlight in order to prevent the occurrence of fungus or excessive heating of the soil and stored off site at an appropriate facility for vernal pool inoculum. Inoculum from different source pools will not be mixed for seeding any restored pools. The collected soils will be spread out and raked into the bottoms of the restored pools. Topsoil and plant materials salvaged from the upland habitat areas to be impacted will be transplanted to, and/or used as a seed/cutting source for, the upland habitat restoration/creation areas to the maximum extent practicable as approved by the Agencies.

6. To ensure that the construction and operation of the project does not adversely affect the vernal pools within the western and eastern preserves, monitoring will be conducted throughout the rainy season to determine whether surface runoff is causing erosion and sediment delivery to these vernal pools. Monitoring will occur during project construction and for 3 years following project construction for each phase. In the event that sufficient rainfall to demonstrate adequate ponding does not occur during the 3 years following project construction, monitoring will continue in 1-year increments, to a maximum of 5 years. A monitoring report will be submitted by January 31 following each monitoring season. The monitoring program will be described in the final vernal pool restoration/enhancement plan. If the monitoring detects impacts to the adjacent vernal pools from construction and/or operation of the proposed project (e.g., from changes in hydrology) within the monitoring period, the project proponent will take immediate action to remediate the impact, or offset the impact as approved by the Agencies if remediation is not possible.

7. Any development adjacent to the vernal pool restoration/enhancement sites will be constructed to slope away from the pools, to ensure that runoff from the project does not flow into the pools.

8. Drainage from the construction area will not drain directly into the MHPA or any adjacent vernal pool restoration/enhancement areas. The use of structural and non-structural Best Management Practices, Best Available Technology, the restriction of grading and paving activity during a significant rain event, and the use of sediment catchment devices downstream of construction and paving activities will reduce potential impacts associated

with construction. The project design will comply with the Standard Urban Stormwater Management Plan and Municipal Stormwater Permit criteria of the State Water Resources Control Board and the Clean Water Act section 401 Water Quality Certification issued by the Regional Water Quality Control Board for the Project.

9. Grading activities immediately adjacent to vernal pools will be timed to avoid wet weather to minimize potential impacts (e.g., siltation) to the vernal pools unless the area to be graded is at an elevation below the pools. To achieve this goal, grading adjacent to avoided pools will comply with the following:

   a. Grading will occur only when the soil is dry to the touch at the surface and 1 in (2.5 cm) below. A visual check for color differences (i.e., darker soil indicating moisture) in the soil between the surface and 1 in (2.5 cm) below indicates the soil is dry;

   b. After a rain of greater than 0.2 in (0.5 cm), grading will occur only after the soil surface has dried sufficiently as described above, and no sooner than 2 days (48 hours) after the rain event ends;

   c. To prevent erosion and siltation from storm water runoff due to unexpected rains, Best Management Practices (i.e., silt fences) will be implemented as needed during grading;

   d. If rain occurs during grading, work will stop and resume only after soils are dry, as described above; and

   e. Grading will be done in a manner to prevent run-off from entering preserved vernal pools.

10. All lighting, including night lighting for project construction, installed in the vicinity of the vernal pool watersheds, MHPA, native vegetation communities, and other open space will be directed away or shielded to prevent light overspill. Streetlights will be low-intensity and shielded to minimize illumination of the adjacent vernal pools and MHPA. Night lighting of construction areas will be of the lowest illumination necessary for human safety, selectively placed, shielded and directed away from natural habitats. The project proponent will submit a draft lighting plan to the Agencies for approval within 60 days of initiating project impacts. The project proponent will submit to the Agencies the final lighting plan within 30 days of receiving approval of the draft plan.

11. Storage and staging areas will be placed as far from sensitive areas as possible and kept free from trash and other waste. Staging areas for construction work will be located within previously disturbed sites and not adjacent to or within sensitive habitat. All construction-related debris will be removed off site to an approved upland disposal facility (not waters of the U. S., including Corps jurisdictional wetlands).

12. The changing of oil, refueling, and other actions that could result in a release of a hazardous substance will be restricted to designated areas that are a minimum of 100 ft (30.5 m) from any vernal pools, road pools, sensitive plant populations, sensitive habitats, or drainages. Such designated areas will be surrounded with berms, sandbags, or other barriers to further prevent the accidental spill of fuel, oil, or chemicals. Any accidental spills will be immediately contained, cleaned up, and properly disposed.

13. Impacts from fugitive dust will be avoided and minimized through watering and other appropriate measures.

14. The project proponent will staff a qualified biologist with a minimum 3 years of vernal pool experience (vernal pool biologist) for each phase of project construction who will be responsible for overseeing compliance with protective measures for the fairy shrimp and will be approved by the Agencies. The project biologist must be knowledgeable of upland and vernal pool biology and ecology. The project proponent will submit the project biologist's name, address, telephone number, and work schedule on the project to the Agencies at least 30 days prior to initiating project impacts. The project biologist will perform the following duties:

    a. Allow salvage of live plants and collection of inoculum for transplant to pools, watersheds and surrounding uplands to be restored/enhanced as practicable and approved by the Service;

    b. Be on site during work and/or grading adjacent to vernal pools and unvegetated pools supporting San Diego fairy shrimp and Riverside fairy shrimp to be preserved to ensure compliance with all conservation measures;

    c. Oversee installation of and inspect the fencing and erosion control measures within or up-slope of vernal pool restoration/enhancement and/or preservation areas a minimum of once per week and daily during all rain events to ensure that any breaks in the fence or erosion control measures are repaired immediately;

    d. Periodically monitor the work area to ensure that work activities do not generate excessive amounts of dust;

    e. Train all contractors and construction personnel on the biological resources associated with this project and ensure that training is implemented by construction personnel. At a minimum, training will include: 1) the purpose for resource protection; 2) a description of the San Diego fairy shrimp and Riverside fairy shrimp and its/their habitat(s); 3) the conservation measures given in the biological opinion that should be implemented during project construction to avoid and/or minimize impacts to the San Diego fairy shrimp and Riverside fairy shrimp, including strictly limiting activities, vehicles, equipment, and construction materials to the fenced project footprint to avoid sensitive resource areas in the field (i.e., avoided areas delineated on maps or on the project site by fencing); 4) environmentally responsible construction practices as outlined in measure 8; 5) the protocol to resolve conflicts that may arise at any time during the construction process; 6) the general provisions of the Act, the need to adhere to the provisions of the Act, and the penalties associated with violating the Act;

f. Halt work, if necessary, for any project activities that are not in compliance with the conservation measures committed to as part of the project and specified in this biological opinion and conditions of the Corps permit. The biologist will report any non-compliance issues to the Agencies within 24 hours of its occurrence and confer with the Agencies to ensure the proper implementation of species and habitat protection measures;

g. Submit monthly compliance reports (including photographs of impact areas) to the Agencies to show that authorized impacts were not exceeded and general compliance with all conservation measures and terms and conditions. A separate memo/report will be prepared and submitted to the Agencies immediately if/when an impact occurs outside of the approved project limits;

h. Submit a final report to the Agencies within 60 days of project completion that includes: as-built construction drawings with an overlay of pools that were impacted or preserved, photographs of the preserved pools, and other relevant information documenting that authorized impacts were not exceeded and that general compliance with the project as described in this biological opinion, including the conservation measures, was achieved.

15. The Construction Manager will keep the project biologist up-to-date with current plans for each phase. A pre-construction meeting will be conducted with the project biologist, vernal pool restoration biologist, and construction supervisors prior to all earthwork. The Agencies will be invited to the pre-construction meeting with 14 days advance notice. The contractors will be informed that the fenced areas are "no-entry" areas for the duration of construction. Each employee (including temporary, contractors, and subcontractors) will participate in a training/awareness program that will be presented by the vernal pool restoration and project biologist(s), prior to working on the proposed project. At a minimum, the program will include the following topics:

a. The purpose for resource protection;

b. A description of San Diego fairy shrimp and Riverside fairy shrimp and their habitats;

c. The conditions of the Corps permit and the conservation measures described in the Service's biological opinion that should be implemented during project construction to conserve San Diego fairy shrimp and Riverside fairy shrimp, including strictly limiting activities, vehicles, equipment, and construction materials to the fenced project footprint to avoid sensitive resource areas in the field (i.e., avoided areas delineated on maps or on the project site by fencing);

d. Project features designed to reduce impacts to these species and promote their persistence/survival within the project area;

e. Employees will strictly limit their activities, vehicles, equipment, and construction materials to the fenced project footprint;

f. To avoid attracting avian predators, the project site will be kept as clean of debris as possible. All food related trash items will be enclosed in sealed containers and regularly removed from the site;

g. Pets of project personnel will not be allowed on the project site;

h. Disposal or temporary placement of excess fill, brush or other debris will not be allowed in avoided waters of the U.S., as identified by flagging and/or fencing;

i. The protocol to resolve conflicts that may arise at any time during the construction process;

j. The general provisions of the Act, the need to adhere to the provisions of the Act, and the penalties associated with violating the Act; and

k. A fact sheet that includes color photographs of the listed species, which will be shown to the employees. Following the education program, the fact sheet will be posted in the contractor and Resident Engineer's office, where they will remain through the duration of the Project. The project proponent and the biologist(s) will be responsible for ensuring that employees are aware of the listed species.

16. The project proponent will post a performance bond or letter of credit with the Corps for grading, planting, and 5 years of maintenance and monitoring of the vernal pool and upland restoration/enhancement areas (including a 20 percent contingency to be added to the total cost). This financial assurance is to guarantee the successful implementation of the vernal pool/upland restoration/enhancement. The project proponent will submit a draft financial assurance instrument with an itemized cost list to the Agencies for approval at least 60 days prior to initiating project impacts. The project proponent will submit the final bond or letter of credit for the amount approved by the Agencies within 30 days of receiving Agency approval of the draft financial insurance instrument.

17. The project proponent will execute and record a perpetual biological conservation easement over the 15.76-ac (6.39 ha) western and 2.1-ac (0.8 ha) eastern preserves. This easement will be in favor of an entity approved by the Agencies. The Service will be named as third party beneficiary in the conservation easement and the terms of the easement will be

approved by the Agencies prior to its execution. This easement will state that no other easements or activities (e.g., fuel modification zones, public trails, drainage facilities, walls, maintenance access roads) that would result in soil disturbance and/or vegetation removal will be allowed within the biological conservation easement area. The project proponent will submit a draft conservation easement agreement to the Agencies for review and approval at least 90 days prior to initiating project impacts and will not initiate project impacts until the easement is approved by the Agencies. The project proponent will submit the final easement and evidence of its recordation to the Agencies within 90 days of recordation of the final map.

18. The project proponent will implement a perpetual long-term management, maintenance and monitoring plan (e.g., HMP) for the biological conservation easement areas. The HMP should include, but not be limited to, the following: method of protecting the resources in perpetuity (e.g., conservation easement); monitoring schedule; measures to prevent human and exotic species encroachment; funding mechanism; and contingency measures should problems occur. The easement holder shall designate a qualified organization or individual with suitable natural resource management experience and approved by the Agencies will be designated to manage the site. The project proponent will also establish a non-wasting endowment in an amount approved by the Agencies based on a Property Analysis Record (PAR; Center for Natural Lands Management ©1998) or similar cost estimation method to secure the ongoing funding for the perpetual long-term management, maintenance and monitoring of the biological conservation easement area by an agency, non-profit organization, or other entity approved by the Agencies. The project proponent will submit a draft HMP including a description of perpetual management, maintenance and monitoring actions and the PAR or other cost estimation results for the non-wasting endowment to the Agencies for approval at least 90 days prior to initiating project impacts. The project proponent will submit the final HMP to the Agencies and transfer the funds for the non-wasting endowment to a non-profit conservation entity, within 60 days of receiving approval of the draft plan. The project proponent will not initiate project impacts until the HMP is approved and a funding mechanism acceptable to the Agencies is in place.

19. The project proponent will install permanent protective fencing along any interface with developed area, and/or use other measures approved by the Agencies, to deter human and pet incursion into the biological conservation easement areas. Fencing will have no gates (accept to allow access for maintenance and monitoring of the biological conservation easement areas) and be designed to prevent intrusion by pets, especially cats. Signage for the biological conservation easement areas will be posted and maintained at conspicuous locations. Plans for fencing and/or other preventative measures will be submitted to the Agencies for approval at least 60 days prior to initiating project impacts. Fencing, as approved by the Agencies, will be installed within 60 days of execution of the conservation easement.

20. The project proponent will ensure that development landscaping adjacent to the biological conservation easement area(s) does not include exotic plant species that may be invasive to

native habitats. Exotic plant species not to be used include any species listed on the California Invasive Plant Council's (Cal-IPC) "Invasive Plant Inventory" List. This list includes such species as pepper trees, pampas grass, fountain grass, ice plant, myoporum, black locust, capeweed, tree-of-heaven, periwinkle, sweet alyssum, English ivy, French broom, Scotch broom, and Spanish broom. A copy of the complete list can be obtained from Cal-IPC's web site at http://www.cal-ipc.org. Plants that require intensive irrigation, fertilizers, or pesticides should not be used in landscaping adjacent to preserve areas and water runoff from landscaped areas should be directed away from the biological conservation easement areas and contained and/or treated within the development footprint. The project proponent will submit a draft list of species to be included in the landscaping to the Service for approval at least 30 days prior to initiating project impacts. The project proponent will submit to the Service the final list of species to be included in the landscaping within 30 days of receiving approval of the draft list of species. The project proponent will not initiate project impacts until the list of species to be included in the landscaping is approved by the Service.

21. The project proponent will develop a resident education program in coordination with the Service. The project proponent will submit a draft program to the Service for approval at least 30 days prior to initiating project impacts. The program will advise residents of the potential impacts to the listed species and the potential penalties for taking such species. The program will include, but not be limited to, information pamphlets and signage of the fencing between the development and the biological conservation easement. Pamphlets will be distributed to all residences. At a minimum, the program will include the following topics: occurrence of the listed and sensitive species in the area, their general ecology, sensitivity of the species to human activities, how to prevent the spreading of nonnative ants and other insect pests from developed areas into preserved areas, impacts from free-roaming pets (particularly domestic and feral cats), legal protection afforded these species, penalties for violations of Federal and State laws, reporting requirements, and project features designed to reduce the impacts to these species and promote continued successful occupation of the preserved areas. The project proponent will submit to the Service the final program within 60 days of receiving approval of the draft program and will not initiate project impacts until receipt of Service approval of the draft program.

22. Any planting stock to be brought onto the project site for landscape or habitat creation/restoration/enhancement will be first inspected by a qualified pest inspector to ensure it is free of pest species that could invade natural areas, including but not limited to, Argentine ants (*Iridomyrmex humil*), fire ants (*Solenopsis invicta*) and other insect pests. Any planting stock found to be infested with such pests will not be allowed on the project site or within 300 ft (91.4 m) of natural habitats unless documentation is provided to the Service that these pests already occur in natural areas around the project site. The stock will be quarantined, treated, or disposed of according to best management principles by qualified experts in a manner that precludes invasions into natural habitats. The project proponent will ensure that all temporary irrigation will be for the shortest duration possible,

and that no permanent irrigation will be used, for landscape or habitat creation/restoration/enhancement.

STATUS OF THE SPECIES

San Diego Fairy Shrimp

Listing Status

The San Diego fairy shrimp was federally listed as endangered on February 3, 1997, (62 FR 4925). The *Recovery Plan for Vernal Pools of Southern California* ("vernal pool recovery plan"), which includes San Diego fairy shrimp, was published in September 1998 (Service 1998).

The Service completed a 5-Year Review of San Diego fairy shrimp in September 2008 (Service 2008a) and published a notice announcing the completion of the review in the *Federal Register* on March 25, 2009 (74 FR 12878). The 5-Year Review recommended no change in the status of the San Diego fairy shrimp.

Critical Habitat

Critical habitat for the San Diego fairy shrimp was designated on October 23, 2000 (65 FR 63438). Critical habitat was remanded but not vacated by the Central District Court of California on June 12, 2002. Critical habitat was re-proposed on April 22, 2003 (68 FR 19887). Revised critical habitat for the San Diego fairy shrimp was designated on December 12, 2007 (72 FR 70648). On May 27, 2010, the District Court of the District of Columbia (D.C. Court) upheld the revised critical habitat designation (*Otay Mesa Property L.P. et al. v U. S. Fish and Wildlife Service et al.*, 1:08-CY-00383).

Species Description

The San Diego fairy shrimp is a small, freshwater crustacean in the family Branchinectidae of the Order Anostraca. The species was originally described by Fugate (1993) from samples collected on Del Mar Mesa, San Diego County. Male San Diego fairy shrimp are distinguished from males of other *Branchinecta* species by differences found at the distal (located far from the point of attachment) tip of the second antennae. Females are distinguishable from females of other species of *Branchinecta* by the shape and length of the brood sac, the length of the ovary, and by the presence of paired dorsolateral (located on the sides, toward the back) spines on five of the abdominal segments (Fugate 1993). Adult male San Diego fairy shrimp range in size from 0.35 to 0.63 in (9 to 16 mm), and adult females are 0.31 to 0.55 in (8 to 14 mm) long.

Distribution

The range of the San Diego fairy shrimp includes Orange and San Diego counties in southern California, and northwestern Baja California, Mexico (Service 1998, Brown et al. 1993). In Baja

California, San Diego fairy shrimp have been recorded at two localities: Valle de Palmas, south of Tecate and Baja Mar, north of Ensenada. A single isolated female was previously reported from vernal pools in Isla Vista, Santa Barbara County, California; however, directed surveys have not located any additional individuals (62 FR 4925).

In Orange County, the San Diego fairy shrimp has been documented at Fairview Park (CNDDB occurrence #11, 1996), Newport Banning Ranch, Irvine Ranch Lands Reserve (within an area formerly known as the North Ranch Policy Plan Area), and within the San Juan Creek watershed at Chiquita Ridge and Radio Tower Road.

In San Diego County, the species occurs in vernal pools from Marine Corps Base Camp Pendleton (MCBCP) inland to Ramona and south through Del Mar Mesa, Proctor Valley, and Otay Mesa. A minimum of 246 pools on MCBCP are known to be occupied by San Diego Fairy Shrimp. Based on surveys of the 2,856 vernal pool basins currently mapped on Marine Corps Air Station Miramar, 1,303 are occupied by San Diego fairy shrimp (Miramar 2006). Of the 62 vernal pool complexes[1] mapped by the City of San Diego[2], 29 were found to be occupied by San Diego fairy shrimp and occur at the following localities: Del Mar Mesa (1), Carmel Mountain (1), Mira Mesa (6), Nobel Drive (3), Kearny Mesa (3), Mission Trails Regional Park (1), and Otay Mesa (14) (City of San Diego 2004b).

Additional vernal pool complexes with occurrences of San Diego fairy shrimp located in San Diego County but not included in the City of San Diego's Inventory include: Carlsbad, San Marcos, Ramona, Poway, Santee, Rancho Santa Fe, Murphy Canyon, Otay Lakes, Imperial Beach, East Otay Mesa, Marron Valley, and Proctor Valley (CNDDB Occurrence # 27, 2001).

Habitat Affinity

San Diego fairy shrimp are restricted to vernal pools and vernal pool-like depressions (e.g., ruts in dirt roads). Vernal pools are ephemeral wetlands that occur from southern Oregon through California into northern Baja California, Mexico (Service 1998). They require a unique combination of climatic, topographic, geologic, and evolutionary factors for their formation and persistence. They form in regions with Mediterranean climates where shallow depressions fill with water during fall and winter rains and then dry up when the water evaporates in the spring (Collie and Lathrop 1976; Holland 1976; Holland and Jain 1977, 1988; Thorne 1984).

Downward percolation of water within the pools is prevented by an impervious subsurface layer consisting of claypan, hardpan, or volcanic stratum (Holland 1976, 1988). Seasonal inundation makes vernal pools too wet for adjacent upland plant species adapted to drier soil conditions, while rapid drying during late spring makes pool basins unsuitable for typical marsh or aquatic

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[1] Vernal pool complexes are defined as a series of vernal pool groups that are hydrolocially connected with similar soil types and species compositions. They were first described and surveyed by Beauchamp and Cass 1979 and subsequently updated in 1986 (Bauder) and 1998 (Recovery Plan).

[2] The City of San Diego conducted non-protocol surveys for San Diego fairy shrimp. Therefore this inventory may under-represent the true number of vernal pools with occurrences of San Diego fairy shrimp.

species that require a more persistent source of water. Local upland vegetation communities associated with vernal pools include needlegrass grassland, annual grassland, coastal sage scrub, maritime succulent scrub, and chaparral (Service 1998).

San Diego fairy shrimp tend to inhabit shallow, small vernal pools and vernal pool-like depressions that range in temperature from 50° to 79° Fahrenheit (° F) [10° to 26° Celsius (° C)]. They are ecologically dependent on seasonal fluctuations in their habitat, such as absence or presence of water during specific times of the year, duration of inundation, and other environmental factors that likely include specific salinity, conductivity, dissolved solids, and pH levels (Gonzalez et al. 1996, Hathaway and Simovich 1996, and Holtz 2003)

Life History

San Diego fairy shrimp are non-selective particle feeding filter-feeders, or omnivores. Detritus, bacteria, algal cells, and other items between 0.3 to 100 microns may be filtered and ingested (Eriksen and Belk 1999). Adult fairy shrimp are usually observed from January to March; however, in years with early or late rainfall, the hatching period may be extended (65 FR 63438). Like most vernal pool fairy shrimp, San Diego fairy shrimp have a two-stage life cycle and spend the majority of their life cycle in the cyst stage (Templeton and Levin 1979, Schaal and Leverich 1981, Herzig 1985, Hairston and De Stasio 1988, Venable 1989). After hatching, San Diego fairy shrimp reach sexual maturity in about 7 to 17 days, depending on water temperature, and persist for about 4 to 6 weeks (Hathaway and Simovich 1996). Fairy shrimp mate upon reaching maturity, and female San Diego fairy shrimp produce between 164 and 479 cysts (eggs) over their lifetime (Simovich and Hathaway 1997). The cysts are either dropped by the females to settle into the mud at the bottom of the pool, or they remain in the brood sac until the female dies and sinks to the bottom (Eriksen and Belk 1999). Fairy shrimp cysts may persist in the soil for several years until conditions are favorable for successful reproduction (Simovich and Hathaway 1997). The cysts will hatch in 3 to 5 days when water temperatures are between 50° to 68° F (10° and 20° C) (Hathaway and Simovich 1996). Not all cysts are likely to hatch in a season, thus providing a mechanism for survival if water quality and ponding conditions are not favorable in a given year (Simovich and Hathaway 1997, Ripley et. al. 2004).

Population Trend

The loss of vernal pools that have the potential to support San Diego fairy shrimp has resulted in a reduction in diversity and abundance of throughout the range of the San Diego fairy shrimp. Urban and water development, flood control, highway and utility projects, and conversion of wild lands to agricultural use have eliminated or degraded vernal pools and/or their watersheds in southern California (Jones and Stokes Associates 1987). Historically, vernal pools covered approximately 200 square mi (518 square km) of San Diego County (Bauder and McMillan 1998). Approximately 95 to 97 percent of vernal pools within San Diego County have been lost (Bauder 1986, Bauder and McMillan 1998, Oberbauer 1990).

At the time of listing, San Diego fairy shrimp were known to inhabit a minimum of 25 vernal pool complexes in coastal areas of San Diego, Orange, and Santa Barbara counties, and northwestern Baja California, Mexico (62 FR 4925). However, because the names and locations of all complexes were not specified in the listing rule, the status of some complexes cannot be ascertained. Currently, 137 complexes occupied by San Diego fairy shrimp have been identified in the U.S.; an additional 3 complexes that were identified as occupied at listing have since been extirpated (Service 2008a). Most of these additional complexes fall within the extant range of the San Diego fairy shrimp known at the time of listing. We expect that these additional complexes and occurrences were occupied at the time of listing, but had not been identified due to lack of survey effort, and thus do not represent an actual expansion of San Diego fairy shrimp distribution and range into previously unoccupied areas. Rather, they provide a better understanding of the historical distribution and range of the San Diego fairy shrimp that was unknown at the time of listing. Therefore, we estimate that the overall San Diego fairy shrimp distribution has not decreased or increased appreciably since listing. A summary of occupied vernal pool complexes is provided in Appendix 1 of the *San Diego Fairy Shrimp (Branchinecta sandiegonensis) 5-Year Review: Summary and Evaluation* (Service 2008a).

Threats and Conservation Needs

The loss and modification of vernal pool habitat continues to be a significant threat to the San Diego fairy shrimp, especially in areas where urbanization is expected to expand. Of the estimated 137 vernal pool complexes now occupied by San Diego fairy shrimp, Service files show that approximately 38 percent are on military land where they are managed for conservation under Integrated Natural Resource Management Plans (INRMPs) or protected by other means, and approximately 25 percent are at least partially conserved on other lands. Approximately 20 percent of occupied complexes have lost some pools to development, 2 percent have been completely developed, and 18 percent are proposed for development. Acquisition of land and conservation easements have resulted in the preservation of vernal pool habitat for the species, but the trend of habitat loss, fragmentation, and degradation continues, particularly on private lands. Additionally, even preserved lands are often subject to impacts such as invasion by nonnative plants, off-highway vehicle (OHV) use, trespassing, and other conditions that contribute to lower-quality habitat for San Diego fairy shrimp (Service 2008a).

San Diego fairy shrimp habitat is also threatened to some degree by indirect impacts of development (including OHV use and other human access and disturbance impacts, runoff, dumping of trash and litter, and water and air pollution) resulting from the proximity of San Diego fairy shrimp habitat to development. OHV use for recreation, law enforcement (including Border Patrol), and military threatens this species throughout much of its range. Nonnative plants also threaten San Diego fairy shrimp habitat throughout its range. San Diego fairy shrimp habitat is naturally fragmented, but development projects continue to further fragment and isolate vernal pools within and between complexes, which may disrupt the population dynamics of the species. Conservation measures beyond habitat preservation, such as habitat and species management and monitoring, are necessary to ensure the long-term sustainability and persistence of this species throughout its range (Service 2008a).

Impacts to vernal pools from development have been offset through the restoration, enhancement, and management of habitat. In some cases, due to security of the site and the active management of the vernal pools, the species status has improved. In addition, grants have been awarded to restore habitat in several areas including Otay Mesa, the San Diego National Wildlife Refuge, and Sweetwater Authority lands. Sites that have been restored benefit from fencing and management, which further removes threats from the site that were occurring prior to the restoration efforts (Service 2008a).

Recovery Planning

The Service prepared the vernal pool recovery plan for seven federally listed vernal pools species, including the San Diego fairy shrimp (Service 1998). The vernal pool recovery plan divides southern California vernal pools into eight management units, five of which contain San Diego fairy shrimp. The units with San Diego fairy shrimp are Los Angeles-Orange, North Coastal San Diego (which includes MCBCP), Central Coastal San Diego (which includes Miramar), South Coastal San Diego, and Inland Valleys San Diego. Overall, the vernal pool recovery plan indicated a total of approximately 155 complexes should be secured, including approximately 112 complexes (74 of which are now identified as occupied) listed in Appendix F of the recovery plan as necessary to stabilize the species, and 43 complexes (11 of which are now identified as occupied) listed in Appendix G as necessary to reclassify the species.

Of the total 155 complexes that the vernal pool recovery plan identified, at least 21 of the 74 complexes occupied by the San Diego fairy shrimp (28 percent) listed in Appendix F of the recovery plan, and 3 of the 11 occupied complexes (27 percent) listed in Appendix G, have been at least partially conserved. In addition, at least 36 complexes listed in Appendix F (about 49 percent), and 7 complexes listed in Appendix G (64 percent) are on military land and thus (at least partially) are considered conserved (Appendix 1 of Service 2008a). However, long-term maintenance and monitoring for most restored and preserved vernal pools is either nonexistent, inadequate, or has not been guaranteed in perpetuity. At least 8 occupied complexes listed in the vernal pool recovery plan (i.e., 7 in Appendix F and 1 in Appendix G) are proposed for development. At least 15 complexes listed in Appendices F and G of the vernal pool recovery plan contain one or more pools that have been developed since listing, and 5 contain pools that have been substantially degraded by other impacts since listing (the damage caused by most of these impacts has since been remediated) (see Appendices 1 and 2 of this review). Approximately 44 complexes listed in Appendices F and G of the vernal pool recovery plan occur on private lands that are not conserved or proposed for conservation (Service 2008a).

However, based on our evaluation of the vernal pool recovery plan in the *San Diego Fairy Shrimp 5-Year Review* (Service 2008a) and the information gained about San Diego fairy shrimp occurrences since listing, the numbers given in the recovery plan (e.g., a total of 155 complexes) are considered approximate because which complexes are included under the groupings in Appendices F and G are unclear in the recovery plan. The *San Diego Fairy Shrimp 5-Year Review* recommended that the vernal pool recovery plan be updated to determine which of the known occurrences of San Diego fairy shrimp are needed for recovery of this species (Service 2008a). This evaluation has not been accomplished for the San Diego fairy shrimp.

Therefore, when evaluating the impacts of development projects on the recovery of San Diego fairy shrimp, we no longer use the vernal pool recovery plan alone to identify vernal pool complexes important to recovery of the San Diego fairy shrimp. Instead, we use an updated database of extant complexes occupied by the San Diego fairy shrimp (Appendix 1 of Service 2008a) and evaluate potential impacts to these complexes on a project-specific basis to determine the impact of the project on the recovery of the San Diego fairy shrimp.

Riverside Fairy Shrimp

Listing Status

The Service listed the Riverside fairy shrimp as endangered on August 3, 1993 (58 FR 41391). The vernal pool recovery plan also includes Riverside fairy shrimp (Service 1998).

The Service completed a 5-Year Review of Riverside fairy shrimp in September 2008 (Service 2008b) and published a notice announcing the completion of the review in the *Federal Register* on March 25, 2009 (74 FR 12878). The 5-Year Review recommended no change in the status of the Riverside fairy shrimp.

Critical Habitat

Critical habitat was designated for the species on May 30, 2001 (66 FR 29384); however, this designation was vacated on October 30, 2002, by order of the D.C. Court. Critical habitat for the Riverside fairy shrimp was re-proposed on April 27, 2004, and the final rule for revised critical habitat was issued April 12, 2005 (70 FR 19154).

Species Description

The Riverside fairy shrimp is a small freshwater crustacean in the Family Streptocephalidae of the Order Anostraca. The species was first collected in 1979 by Clyde Eriksen and formally described as a new species in 1990 (Eng et al. 1990). The Riverside fairy shrimp is distinguished from similar species by its red-colored cercopods (anterior appendages), which occur on all of the ninth and 30 to 40 percent of the eighth abdominal segments (Eng et al. 1990). Adult Riverside fairy shrimp may grow to a length of 0.5 to 1.0 in (13 to 25 mm) (Eng et al. 1990).

Distribution

The range of the Riverside fairy shrimp includes Ventura, Los Angeles, Orange, San Diego, and Riverside counties in southern California, and Bajamar in Baja California, Mexico (Service 1998, Brown et al. 1993). With the exception of populations in Riverside and Ramona, all populations are within 10 mi (16.1 km) of the coast over a north-south distance of approximately 125 mi (201.2 km).

In Ventura County, Riverside fairy shrimp were previously known from a single large pool in a grassland area within the Tierra Rejada Vernal Pool Preserve. However, wet season surveys conducted each season between 2002 and 2006 failed to locate any adults (Mountains Recreation and Conservation Authority 2006).

Riverside fairy shrimp habitat located on approximately 198 ac (80 ha) of open space in Los Angeles County was removed in conjunction with the Los Angeles International Airport Master Plan Project (Service 2004) and Operations and Maintenance Activities Project (Service 2005b) at Los Angeles International Airport (LAX). Cysts from LAX may be transferred to Madrona Marsh Preserve in the City of Torrance once pools have been restored for this species. A small number of Riverside fairy shrimp cysts, but no adults, have been found in Madrona Marsh (Angelos 2003). The species was previously reported from Cruzan Mesa; however, recent surveys found only vernal pool fairy shrimp (*Branchinecta lynchi*) at this location (Glenn Lukos Associates 2004).

In Orange County, extant pools create a chain of Riverside fairy shrimp habitat along the Orange County foothills. These pools are generally formed by depressions in slumping earth or impounded ephemeral streams (Riefner and Pryor 1996). From north to south, Riverside fairy shrimp occur on the former Marine Corps Air Station, El Toro (HELIX 2005f); Southern California Edison's (SCE) Viejo Substation (PCR 1998); Live Oak Plaza (Glenn Lukos Associates 1997); Saddleback Meadows (Urban Vision 1997, HELIX 2000); adjacent to the northern boundary of O'Neill Regional Park (CNDDB occurrence #17, 2001), Tijeras Creek (Glenn Lukos Associates 2001); and within the San Juan Creek watershed at Chiquita Ridge and Radio Tower Road (Dudek and Associates 2001b).

In Riverside County, the species has been documented at the Skunk Hollow Pool in the Barry Jones Wetland Mitigation Bank (Center for Natural Lands Management 2006); the Field Pool near the Skunk Hollow Pool (Eriksen 1988); the Australia Pool in Lake Elsinore back basin (Jones 1998); the Schleuniger Pool, north of La Estrella Road (Hayworth 1998); March Air Reserve Base (Patterson and Ayers 1998); Scott Pool, northeast of the intersection of Scott Road and Menifee Road (HELIX 2002); a stockpond and another basin at the Rancho California Road property (Black 2004a); Rainbow Canyon (Tom Dodson & Associates 2003a,b); Pechanga Pool on the Pechanga Indian Reservation (Wegscheider 2006); two pools on Warm Springs Ranch (Helix 2006); and within created pools on Johnson Ranch (Neudecker 2003). In addition, Riverside fairy shrimp will be introduced to created pools on Clayton Ranch once habitat conditions are adequate to support the species (Service 2003).

Occupied pools in Riverside County at Grizzle Ranch (Wegscheider 2004), the Garbani property (Michael Brandman Associates 2006), and Temecula Education Complex Project site (Western Riverside County Regional Conservation Authority 2006) will be filled in conjunction with approved development projects. The Garbani and Temecula Education Complex projects made a voluntary donation to the Western Riverside County Vernal Pool Conservation Fund. We are unaware of any measures taken to offset impacts at Grizzle Ranch.

In north coastal San Diego County, the Riverside fairy shrimp occurs in vernal pools on MCBCP (Recon 2001, Black 2004b, URS 2005) and at the Poinsettia Land Station in the City of Carlsbad (Dudek & Associates 1998). In central San Diego County, a single occupied pool occurs within Marine Corps Air Station Miramar (The Branchiopod Research Group 1996). In southern San Diego County, the species occurs in pools on Otay Mesa near the U.S./Mexico border (City of San Diego 2003). Of the 62 vernal pool complexes mapped by the City of San Diego's Vernal Pool Inventory (2002-2003), 10 were found to be occupied by Riverside fairy shrimp[3]. In inland San Diego County, the Riverside fairy shrimp occurs in the Ramona T complex, in a vernal pool in Ramona partially on Ramona Airport property, and partially in preserved land adjacent to Ramona Airport (RECON 2007).

Habitat Affinity

Riverside fairy shrimp, like San Diego fairy shrimp, are restricted to vernal pools and vernal pool-like ephemeral basins. For a general discussion on vernal pools, refer to the Habitat Affinity discussion above for the San Diego fairy shrimp.

In contrast to San Diego fairy shrimp, Riverside fairy shrimp prefer deep [greater than 9.8 in (25 cm) in depth] vernal pools that range in temperature from 50° to 77°F (10° to 25° C) and remain filled for extended periods of time (Eng et al. 1990, Eriksen and Belk 1999, U.S. Fish and Wildlife Service 1993). Water within pools supporting Riverside fairy shrimp may be clear, but more commonly it is moderately turbid (Eriksen and Belk 1999). Typically, pools supporting this species have low total dissolved solids and alkalinity (means of 77 and 65 parts per million, respectively), in association with pH at neutral or just below (7.1-6.4) (Eng et al. 1990, Gonzalez et al. 1996, Eriksen and Belk 1999).

Riverside fairy shrimp may also be found in disturbed vernal pool habitats where basins have been compacted or artificially deepened and therefore hold water for longer periods of time. Although basins supporting populations often appear to be artificially created or enhanced, such basins are located within soils that are capable of seasonal ponding and are often surrounded by naturally occurring vernal pool complexes. These "artificial basins" function in the same manner as naturally occurring vernal pools by filling with late fall, winter and/or spring rains that gradually dry up during the spring and/or summer (Service 1998).

Life History

Riverside fairy shrimp are non-selective filter-feeders that filter suspended solids from the water column. Detritus, bacteria, algal cells, and other items between 0.3 to 100 microns may be filtered and ingested. Riverside fairy shrimp are preyed upon by a wide variety of wildlife,

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[3] The City of San Diego conducted non-protocol surveys for Riverside fairy shrimp. Therefore this inventory may under-represent the true number of vernal pools with occurrences of Riverside fairy shrimp.

including beetles, dragonfly larvae, other arthropods, frogs, salamanders, toad tadpoles, shorebirds, ducks and other migratory birds, and even other fairy shrimp (Eriksen and Belk 1999).

Freshwater crustaceans, including Riverside fairy shrimp, have a two-stage life cycle and spend the majority of their life cycle in the cyst stage (Templeton and Levin 1979, Schaal and Leverich 1981). After hatching, Riverside fairy shrimp require 48 to 56 days to reach sexual maturity in contrast with other fairy shrimp that can reach maturity in less than 2 weeks (Hathaway and Simovich 1996). Fairy shrimp mate upon reaching maturity, and female Riverside fairy shrimp produce between 17 and 427 cysts (eggs) over their lifetime (Simovich and Hathaway 1997). The cysts are either dropped by the females to settle into the mud at the bottom of the pool, or they remain in the brood sac until the female dies and sinks to the bottom (Eriksen and Belk 1999). The cysts will hatch in 7 to 12 days when water temperatures are between 50° to 77°F (10° to 25° C) (Hathaway and Simovich 1996). A small percentage of cysts are likely to hatch in a season, thus providing a mechanism for survival if the inundation period is too short in a given year (Simovich and Hathaway 1997). Fairy shrimp cysts may persist in the soil for several years until conditions are favorable for successful reproduction (Simovich and Hathaway 1997).

Population Trend

Many populations of Riverside fairy shrimp have been extirpated or have experienced drastic declines due to the substantial loss of habitat in southern California. The majority of the vernal pools within the range of the Riverside fairy shrimp were lost prior to 1990 (Service 1998). Though extensive vernal pool habitat historically occurred on the coastal plain of Los Angeles and Orange counties (Mattoni and Longcore 1997), such habitat largely has been eliminated from these areas (Keeler-Wolf et al. 1998). Loss of habitat in San Diego County is estimated at 95 to 97 percent (Bauder 1986, Oberbauer 1990). Significant losses of vernal pools supporting this species have also occurred in Riverside County (66 FR 29384).

At the time of listing, Riverside fairy shrimp were known to inhabit 9 vernal pool complexes within Riverside, Orange, and San Diego counties, and Baja Mexico, including four vernal pools in Riverside County, a population in Orange County, two areas in San Diego County, and two locations in Baja California, Mexico (58 FR 41384). However, we now believe the type locality (Murrieta Golf Course) for this species was likely already lost to development prior to listing (Eriksen and Belk 1999). In addition, the one population in Orange County referenced in the listing rule has never been confirmed. Thus, at listing, it is likely that there were only three extant occurrences of Riverside fairy shrimp known from Riverside County, two occurrences known from San Diego County, and two occurrences known from Mexico (i.e., five in the United States and two in Mexico) (Service 2008b).

Since listing, as many as 52 additional occupied complexes have been identified, including a man-made complex at Johnson Ranch. Additionally, a complex (Banning) have been found with *Streptocephalus* species cysts. Although these cysts may be Riverside fairy shrimp, it is more likely they are cysts of the common New Mexico fairy shrimp (*S. dorothae*), which is known to occur in Banning less than 1 mi (1.6 km) from this site (Eriksen and Belk 1999). Since listing, about 9 of the total 57 complexes are known to have been extirpated, and we are unsure whether the species persists in 3 other complexes. Hence, currently 45 known occupied vernal pool complexes (approximately 200 occupied pools) exist, which includes the man-made complex at Johnson Ranch. More than half of all extant complexes known to contain Riverside fairy shrimp are in San Diego County, including 8 complexes on MCBCP. These 8 complexes are of particular interest as they support approximately 56 percent of all identified individual vernal pools known to be occupied by the Riverside fairy shrimp (RECON 2001b, 2007; MCBCP 2007). Approximately 24 percent of extant known occupied complexes are in Riverside County, and approximately 17 percent are in Orange County (information from 2008b). We have no information on the current status of the two occurrences known in Mexico at the time of listing.

Most of the additional complexes identified since listing fall generally within the range of the Riverside fairy shrimp described in the listing rule, although the identification of some complexes broadened the specific range within Riverside, Orange, and San Diego counties. Three complexes were discovered post-listing within Ventura and Los Angeles counties. Of these 3 complexes, 1 extirpated in Los Angeles County, and adult fairy shrimp have not been recently identified in the other 2 complexes (see Table 1 and Appendix 1). Aside from the man-made complex at Johnson Ranch, we believe that these additional complexes and occurrences were occupied at the time of listing, but had not been identified due to lack of survey effort, and thus do not represent an actual expansion of Riverside fairy shrimp distribution and range into previously unoccupied areas. Rather, they provide a better understanding of the historical distribution and range of the Riverside fairy shrimp that was unknown at the time of listing. A summary of occupied vernal pool complexes is provided in Appendix 1 of the *Riverside Fairy Shrimp (Streptocephalus woottoni) 5-Year Review: Summary and Evaluation* (Service 2008b).

Threats and Conservation Needs

The loss and modification of vernal pool habitat continues to be a significant threat to the Riverside fairy shrimp, especially in areas where urbanization is expected to expand. Of the estimated 45 vernal pool complexes known to be occupied, Service files show that approximately 27 percent are on military land where they are managed for conservation under INRMPs or protected by other means, and approximately 36 percent are at least partially conserved on other lands. At least nine complexes known to be occupied by the Riverside fairy shrimp at or since its listing have been developed and the status of many more is uncertain but likely extirpated. Of the estimated 45 occupied vernal pool complexes, 10 complexes have been partially lost to development [approximately 7 ac (3 ha) of habitat lost], and 8 additional complexes contain pools that have been impacted [damaged, but not totally impacted (Appendix 1 of Service 2008b)]. Acquisition of land and conservation easements have resulted in the preservation of vernal pool habitat for the species, but the trend of habitat loss and degradation continues, particularly on private lands. Additionally, even preserved lands are often subject to invasion by nonnative plants and other impacts that lower the quality of habitat for Riverside fairy shrimp (Service 2008b).

Riverside fairy shrimp habitat is also threatened to some degree by indirect effects of development (including OHV use and other human access and disturbance impacts, runoff, dumping of trash and litter, and water and air pollution) resulting from the proximity of Riverside fairy shrimp habitat to development. Nonnative plants also threaten Riverside fairy shrimp throughout the range of the species. Off-highway vehicle use for recreation, law enforcement (including Border Patrol), and the military threatens this species throughout much of its range. Riverside fairy shrimp habitat is naturally fragmented, but development projects continue to further fragment and isolate vernal pools within and between complexes, which may disrupt the population dynamics of the species. Conservation measures beyond habitat preservation, such as habitat and species management and monitoring, are necessary to ensure the long-term sustainability and persistence of this species throughout its range (Service 2008b).

Impacts to Riverside fairy shrimp habitat from development have been offset through the creation, restoration, enhancement, and management of habitat. In some cases, due to security of the site and the active management of the vernal pools, the species status has improved. Sites that have been created, restored, or enhanced benefit from fencing and management, which further removes threats from the site that were previously occurring at these sites. However, these restoration measures have oftentimes been deficient or inadequately carried out (Service 2008b).

Recovery Planning

The vernal pool recovery plan divides southern California vernal pools into eight management units, five of which contain Riverside fairy shrimp. The units with Riverside fairy shrimp are Transverse, Los Angeles-Orange, North Coastal San Diego, Central Coastal San Diego, and South Coastal San Diego. Overall, the vernal pool recovery plan indicated a total of approximately 155 complexes should be secured, including approximately 112 complexes (20 of which are now identified as occupied) listed in Appendix F of the recovery plan as necessary to stabilize the species, and 43 complexes (4 of which are now identified as occupied) listed in Appendix G as necessary to reclassify the species.

Of the total 155 complexes that we have identified from the vernal pool recovery plan, at least 6 of the 20 complexes occupied by Riverside fairy shrimp (30 percent) listed in Appendix F of the recovery plan, and 1 of the 4 occupied complexes (25 percent) listed in Appendix G, have been at least partially conserved. In addition, at least eight complexes listed in Appendix F (40 percent), and one complex listed in Appendix G (25 percent) are on military land and thus (at least partially) are considered conserved (Appendix 1 of Service 2008b). However, long-term maintenance and monitoring for most restored and preserved vernal pools is either nonexistent, inadequate, or has not been guaranteed in perpetuity. At least 3 occupied complexes listed in Appendix F of the vernal pool recovery plan and two occupied complexes in Appendix G are proposed for development. Of the 23 complexes listed in Appendices F and G of the vernal pool recovery plan that have ever been known to be occupied by Riverside fairy shrimp, 8 complexes (35 percent) contain 1 or more pools that have been developed or substantially degraded by other impacts (Appendix 1 of Service 2008b). Approximately 4 of the complexes listed in Appendices

F and G of the vernal pool recovery plan that have ever been known to be occupied by the Riverside fairy shrimp (17 percent) occur (at least partially) on private lands that are not conserved or proposed for conservation (Service 2008b).

However, based on our evaluation of the vernal pool recovery plan in the *Riverside Fairy Shrimp 5-Year Review* (Service 2008b) and the information gained about occurrences since listing, the numbers given in the recovery plan (e.g., a total of 155 complexes) are considered approximate because which complexes are included under the groupings in Appendices F and G of the recovery plan is often unclear. The *Riverside Fairy Shrimp 5-Year Review* recommended that the vernal pool recovery plan be updated to determine which of the known occurrences of Riverside fairy shrimp are needed for recovery of this species (Service 2008b). As with the San Diego fairy shrimp, this evaluation has not been accomplished for the Riverside fairy shrimp.

Therefore, when evaluating the impacts of development projects on the recovery of Riverside fairy shrimp, we no longer use the vernal pool recovery plan alone to identify vernal pool complexes important to recovery of the Riverside fairy shrimp. Instead, we use an updated database of extant complexes occupied by the Riverside fairy shrimp (Appendix 1 of Service 2008a) and evaluate potential impacts to these complexes on a project-specific basis to determine the impact of the project on the recovery of the Riverside fairy shrimp.

ENVIRONMENTAL BASELINE

Regulations implementing the Act (50 CFR § 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation and the impacts of State and private actions that are contemporaneous with the consultation in progress.

Riverside fairy shrimp and San Diego fairy shrimp historically occurred in vernal pool complexes throughout the Otay Mesa ecosystem, which is part of the San Diego: Southern Coastal Mesa Management Area identified in the vernal pool recovery plan (Service 1998). Many of these vernal pool complexes have been developed, converted to agriculture, and/or degraded by OHV use. The vernal pool recovery plan (Service 1998) identifies several vernal pool complexes on Otay Mesa. The project site, which occurs occurs to the south of the J3 complex identified in the recovery plan, is not in an identified vernal pool complex in the plan.

The project site consists of a mesa top previously used for agriculture. The site is undeveloped and supports native and nonnative habitats. Soils on site consist of Olivenhain cobbly loam, Stockpen gravelly clay loam, and Huerhuero loam (Bowman 1973), which typically support vernal pools when they occur in flat areas like Otay Mesa. Historic aerial photographs of the site dating back to 1928 show mima mound features typically associated with vernal pool habitat on Otay Mesa. However, the majority of the property has been actively farmed (i.e., disked and tilled) from approximately 1955 to 2004. The past farming appears to have removed the historic mima mound topography on Lots 1 through 3, which likely supported vernal pools on these lots.

Lot 4 and Lot C have been farmed to a lesser extent, and remnants of some of the original mima mound topography are still visible.

In addition, earthen berms and associated roads have been constructed along the site property boundaries in all directions to restrict access and illegal dumping. Based on the historic aerial photographs, it appears that the berms were constructed sometime between 1995 and 1997. Construction of the berms and roads has altered the drainage patterns so that the only remnants of the past vernal pool habitat on site occur in depressions in the roads and/or near the bases of the berms, and not in a natural configuration among mima mounds as still seen in less disturbed vernal pool complexes. The remaining pools are also subject to impacts from OHV and illegal dumping. In addition, many of the pools are slowly filling in with soil as the constructed berms erode. While the remaining pools on site are highly disturbed, some still support vernal pool plants and listed fairy shrimp.

The MSCP (City 1997b) identifies a MHPA that is intended to link all core biological areas into a regional wildlife preserve. Approximately 1.1 ac (0.4 ha) of the Candlelight Villas West project site lies within the MHPA on the western edge of the site, and 1.4 ac (0.6 ha) of the Candlelight Villas East project site lies within the MHPA on the eastern edge of the site (Figures 4 and 5). The areas of the project site within the MHPA support maritime succulent scrub, nonnative grassland, disturbed habitat, and vernal pools. In addition, land immediately west and east of the property is located within the MHPA, which is considered a significant regional habitat and wildlife preserve and therefore of high value. The MHPA in this portion of Otay Mesa provides connectivity between the Spring Canyon complex and Dennery Canyon to the north.

Service protocol wet-season surveys for San Diego fairy shrimp and Riverside fairy shrimp were conducted on site from January through May 2004 (HELIX 2004a). Sixty-seven pools were initially surveyed, but three pools were filled during the survey period by siltation, OHV impacts, and dumping. Of the 64 remaining pools sampled, 17 pools supported San Diego fairy shrimp, and 1 of these pools also supported Riverside fairy shrimp (i.e., Road Pool 12). Dry season sampling for fairy shrimp cysts was also performed in July 2004 (HELIX 2004b). San Diego fairy shrimp cysts were found in 18 of the 64 pools sampled, and cysts of both species were found in the same pool where the adults of both species were observed. When the 2004 wet and dry survey results are combined, a total of 20 pools supported San Diego fairy shrimp, and one of these pools also supported Riverside fairy shrimp.

Nineteen additional basins were detected on site during the 2004/2005 rainy season, and additional protocol wet-season fairy shrimp surveys were conducted in the new basins, including areas that did not support vegetation indicative of vernal pools (HELIX 2005a). One of the additional basins supported San Diego fairy shrimp (HELIX 2004b and c, and 2005a). Also, one of these additional basins (i.e., Road Pool 16) was not observed to support fairy shrimp by HELIX, but it was observed to support fairy shrimp by Service staff. The fairy shrimp in this basin were not positively identified as San Diego fairy shrimp, but they were presumed to be San Diego fairy shrimp based on the length of time they persisted in the pool.

Service protocol wet- and dry-season fairy shrimp surveys were also conducted within the potential offsite impact areas on the Bachman (HELIX 2005c and d) and Southview (Black 2008) properties, immediately to the south and north of the Candlelight East project site, respectively. Of the pools found off site in, or within, 100 ft (30.5 m) of the project footprint, one pool on the Bachman property supported San Diego fairy shrimp (i.e., Vernal Pool 8).

Based on all of the surveys (including the pool with fairy shrimp observed by the Service), a total of 23 pools that support San Diego fairy shrimp (including a pool that also supports Riverside fairy shrimp) are in the action area of the proposed project.

An initial jurisdictional delineation was conducted in June 2004 that identified jurisdictional areas on the project site (HELIX 2006). The Corps and the Service reviewed the initial delineation during a site visit, and an additional delineation was conducted in December 2004. Upon review of the delineation, the Corps determined that all project-site vernal and road pools supporting listed fairy shrimp species were within the Corps' jurisdiction. On January 25, 2010, the project proponent and the Corps signed a Preliminary Jurisdictional Determination for all aquatic resources, including "road pools," on the Candlelight Villas East and Candlelight Villas West Property.

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action, which will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

Activities that alter hydrology, increase vernal pool habitat fragmentation, or decrease land types suitable for vernal pool formation have the potential to limit the survivability and recovery of San Diego fairy shrimp and Riverside fairy shrimp (Service 1998). Changes in the natural micro-topography surrounding vernal pools will alter natural hydrological regimes and may result in increased runoff, erosion, sedimentation, and contamination into the vernal pools. The complex hydrology of vernal pools is supported by surface flows within the topographic watershed (e.g., the surface area in which water drains into a vernal pool) and subsurface flows that may extend beyond the surface watershed. Surface and subsurface lateral flows between vernal pools and the surrounding uplands influence the onset and level of inundation, and the seasonal drying of vernal pools (Hanes and Stromberg 1998). Therefore, modifications to the uplands surrounding a vernal pool can negatively affect pool hydrology, even if such modifications occur outside the pool surface watershed. For example, grading cuts near pools can accelerate the flow of water out of the subsoil (Bauder 1987). As such, graded slope cuts adjacent to the watersheds of vernal pools may result in "leakage" of water out of the watersheds (City of San Diego 2003). Conversely, trapping all subsurface flows of water within the surface watershed of the vernal pools via putting in retaining walls may alter the hydrology of the pools by changing the onset or duration of ponding. Modifications to the hydrology of vernal pools can also alter the distribution of other vernal pool flora and fauna that are influenced by the length and frequency of water inundation (Bauder 1987, 2000). For instance, nonnative plant species can become more prevalent in disturbed vernal pools when the periods of water inundation are reduced, while freshwater marsh species can expand into disturbed vernal pools when the periods of inundation are increased.

Modifications of landscapes from native to artificial adjacent to exiting vernal pools can alter natural hydrologic regimes, biogeochemical processes, and limit gene flow between pool complexes. Irrigation of artificial landscapes adjacent to vernal pools can saturate the soils and alter the timing and duration of inundation in fairy shrimp habitat. Additionally, water from the irrigation system may enter the fairy shrimp habitat, causing hatching of cysts at inappropriate times for their phenology. Altering the timing and duration of ponding also could negatively affect the ability of San Diego fairy shrimp to grow and reproduce because their phenology is dependent on such factors (Hathaway and Simovich 1996).

San Diego fairy shrimp and Riverside fairy shrimp are "osmoregulators" that maintain constant internal chemical concentrations, but they cannot tolerate wide extremes in sodium or bicarbonate concentrations so they are vulnerable to contaminants in runoff waters and watershed quality that alter levels of salts and alkalinity (Service 1998). Therefore, runoff laden with fertilizers and pesticides from adjacent artificial landscapes could alter the specific water chemistry (Gonzalez et al. 1996) and temperature (Hathaway and Simovich 1996) required by San Diego fairy shrimp, thus negatively affecting their ability to mature and reproduce (Gonzalez et al. 1996, Holtz 2003).

Fragmentation and isolation of vernal pools can threaten the important ecological and mutualistic processes that link vernal pools to each other and the surrounding uplands (Service 1998). Such ecological and mutualistic processes involve insects that pollinate the vernal pools plants; mammals and birds that disperse flora and fauna between vernal pools, including fairy shrimp.

Watershed contiguity augments gene flow in populations already naturally low in variability (Davies 1996) by allowing flooding between pools. Vernal pool organisms are typically defined by the complex in which they occur, in part because gene flow between complexes appears to be extremely low (Fugate 1993, Davies 1996). Isolation of pools or modification of the natural watershed potentially compromises gene flow, resulting in a loss of genetic variability and an increased susceptibility to extinction and reduced fitness (Bohonak 2005, Soulé 1986).

As they become fragmented and isolated, vernal pools can become unsuitable for avian species that consume and disperse vernal pool fairy shrimp species, which could in turn negatively affect the genetic stability of vernal pool fairy shrimp (Proctor 1964, Krapu 1974, Swanson et al. 1974, Driver 1981, Ahl 1991). Vernal pool preserves should provide adequate upland habitat and/or habitat linkages adjacent to vernal pools to support avian species.

The scientific community has repeatedly recommended that conservation of vernal pools include the surrounding upland habitats (Bauder 1987; Thorp and Leong 1995, 1998; California Department of Fish and Game 1998; Hanes and Stromberg 1998; Leidy and White 1998; Service 1998). These surrounding upland habitats influence vernal pool hydrology, species composition, and essential interactions between the species that inhabit them (California Department of Fish and Game 1998). Fragmenting vernal pools from each other can disrupt dispersal and gene flow between populations of vernal pool flora and fauna, increase their vulnerability to stochastic events (Service 2004), and hinder their ability to reestablish after local extinctions (Fugate 1998).

Other indirect effects to San Diego fairy shrimp and Riverside fairy shrimp and their habitats, often referred to as "edge effects," include unauthorized dumping, human and pet intrusion, trampling, vandalism, plant and animal collection, runoff, erosion and siltation, spills and contamination, invasion of nonnative species, and increased OHV and bicycle activity. Examples of quantifiable measures of edge effects include changes in ponding duration and extent, pH and other water quality parameters. Multiple examples exist demonstrating that edge effects can result in direct impacts to vernal pool preserves, including to the 14-ac (5.7 ha) Phoenix Park Vernal Pool Preserve and the 8-ac (3.2-ha) Phoenix Field Ecological Reserve in Sacramento County, California (Clark et. al. 1998). These preserves have a large perimeter relative to their size (i.e., large edge-to-area ratio) and have little to no buffer from surrounding residential and recreational areas. Both preserves have been affected by herbicide use in nearby areas; changes in hydrology; dumping of landscape litter; introduction and invasion of nonnative plants; brush management for fire; encroachment from feral and domestic animals; vandalism of the protective fencing; foot, horse and bicycle traffic; and/or collection of plants and animals.

Similar to the Sacramento pools, vernal pools in San Diego have suffered from dumping, vehicle and foot traffic, irrigation and redirected surface water (i.e., damming and culverts), and invasions of nonnative plants (Bauder 1987). Most vernal pool restoration and/or preserve monitoring reports the Service receives document some form of human disturbance related to urban development that must be corrected. For example, the *Carroll Canyon Vernal Pool Preserve Monitoring Report* for a site visit on September 27, 2004 (City 2004a), documented that trash, illegally planted nonnatives, and dirt discarded by an adjacent landowner had to be removed from the preserve. As another example, vandals removed the protective fencing surrounding vernal pool complexes and constructed moguls (bumps probably used for jumping bicycles) within the vernal pool watersheds located in the West Otay Mesa Environmental Preserve (The Environmental Trust 2003). Although not its primary purpose, the *City of San Diego Vernal Pool Inventory* (City 2004b) also provides documentation of edge effect impacts to preserved vernal pools adjacent to urban development. For example, the inventory notes that trash has been observed in the only remaining pool of the C 27 series at the Mira Mesa Market Center (a.k.a., Cousins Market Center), which is surrounded by housing and Interstate 15.

Habitat favorable for vernal pool formation consists of coastal terraces with an underlying iron-silica impervious soil layer or layers with undulating landscapes, where soil mounds are interspersed with basins, swales, and drainages (Service 1998). As stated above, approximately

95 to 97 percent of vernal pool habitat within San Diego County has been destroyed; loss of remaining habitat that facilitates vernal pool formation will reduce the amount of suitable land available for restoration and re-introduction opportunities of vernal pools, potentially limiting the recovery of listed vernal pool species. Further, because a large number of endemic species occur within vernal pool complex assemblages due to local adaptations to climate and environmental variables, a high degree of genetic differentiation exists among complex assemblages (Bohonak 2005). Loss of entire complex assemblages may result in the loss of the considerable genetic variation that now exists within the San Diego fairy shrimp population.

Vernal pool restoration can reestablish the physical and biotic characteristics of vernal pool habitat such that critical functions are restored. The restored habitat should resemble reference habitat in regard to the following attributes: soil properties, water quality, topography, hydrology, nutrient cycling, species diversity and species interactions. Based on positive data from ongoing monitoring programs it appears that restoration can provide self-sustaining vernal pool ecosystems with clear and significant benefits to San Diego fairy shrimp and Riverside fairy shrimp; especially when cyst translocation occurs from existing (conserved) occupied pools (RECON 2007; Glen Lukos Associates 2005, 2006; Black 2000a, 2000b; EDAW 2005). Benefits of restoration to the San Diego fairy shrimp and Riverside fairy shrimp include increasing the amount of available vernal pool habitat and increasing the quality of existing vernal pool habitat. These benefits, when supplemented by long-term monitoring and management, can reduce threats to the shrimp and maintain and improve the habitat quality and regional distribution of San Diego fairy shrimp and Riverside fairy shrimp. Restoration of vernal pool ecosystems has not only benefited San Diego fairy shrimp and Riverside fairy shrimp but has also provided additional and improved habitat for a number of other vernal pool plant and animal species that coexist with this species. Since 1997, several projects have documented success in the translocation of San Diego fairy shrimp and Riverside fairy shrimp. These include California Terraces on Otay Mesa (RECON 2007), San Diego Spectrum at Kearny Mesa (Glen Lukos Associates 2005), and other vernal pool restoration projects on Otay Mesa, Marine Corps Air Station Miramar, and MCBCP.

Direct Effects

Implementation of the Candlelight Villas Project will directly impact (i.e., grade and fill) a total of 22 pools occupied by the San Diego fairy shrimp with a combined surface area of 0.38 ac (0.15 ha) [i.e., 8 pools with a combined surface area of 0.33 ac (0.13 ha) for East, and 14 pools with a combined surface area of 0.05 ac(0.02 ha) for West], including 1 pool [i.e., Pool 12 with a surface area of 0.17 ac (0.07 ha)] that is also occupied by Riverside fairy shrimp. While vernal pools 1, part of 35 [i.e., 187 sq ft (17.4 sq m)], 36 and 37 occupied by San Diego fairy shrimp will not be directly impacted (i.e., graded and filled), direct impacts have been assessed to these vernal pools because a portion of the pools [i.e., 60 sq ft (5.5 sq m) of pool 35] and/or their watersheds will be directly impacted and/or they will be subject to fuel modification activities.

Prior to initiation of impacts for each project phase, soil containing fairy shrimp cysts will be salvaged from the pools to be graded and filled for use as inoculum in the vernal pools to be restored and enhanced on site. Additional inoculum with fairy shrimp cysts may be collected from offsite donor vernal pools in the Otay Mesa area to supplement the inoculum collected on site. Inoculum will be collected when dry to avoid damaging or destroying fairy shrimp cysts, and no more than 10 percent of the basin area of any offsite donor pool will be used for collection of inoculum. Hand tools (i.e., shovels and trowels) will be used to remove the first 2 in (5.1 cm) of soil from the pools. Whenever possible, the trowel will be used to pry up intact chunks of soil, rather than loosening the soil by raking and shoveling, which can damage the cysts. The soil from each pool will be stored individually in labeled boxes that are adequately ventilated and kept out of direct sunlight to prevent the occurrence of fungus or excessive heating of the soil, and stored off site at an appropriate facility for vernal pool inoculum.

Inoculum will not be introduced into the restored/enhanced pools until after the pools have been demonstrated to retain water for the appropriate amount of time to support San Diego fairy shrimp [i.e., at least 30 days (Hathaway and Simovich 1996, Ripley et. al. 2004)] or Riverside fairy shrimp [i.e., at least 60 days (Hathaway and Simovich 1996)] and have been surveyed for versatile fairy shrimp to the satisfaction of the Agencies. If versatile fairy shrimp are detected in the restored pools, inoculum will not be introduced until measures approved by the Agencies are implemented in attempt to remove the versatile fairy shrimp from the pools. Inoculum will be placed in a manner that preserves, to the maximum extent possible, the orientation of the fairy shrimp cysts within the surface layer of soil (e.g., collected inoculum will be shallowly distributed within the pond so that cysts have the potential to be brought into solution upon inundation).

With the above measures, we expect that the majority of the cysts will be salvaged out of the pools to be graded and filled, and that while some may be crushed or otherwise destroyed, most will survive the salvage/inoculum collection and transplant process. Any cysts remaining in the pools after the salvage/inoculum collection efforts are completed will then be destroyed by grading and filling of the pools.

Based on discussions with the Agencies, the project footprint was reduced from that originally proposed to avoid more existing and restorable vernal pool habitat. Alternatives were also evaluated to further avoid and minimize direct impacts to the pools on site. However, alternatives that provided for reasonable development would have rendered the avoided pools surrounded by development and subject to future indirect impacts that would have threatened their long-term viability.

The project originally proposed to offset the majority of impacts to vernal pools and the listed fairy shrimp off site, with some conservation occurring on the western and eastern portions of the project site. The reduced project footprint allows for the majority of the conservation (restoration/enhancement and management of pools) to occur on the western portion of the project site (some conservation will also occur on the eastern portion of the project site).

Impacts to the vernal and road pools with San Diego fairy shrimp and Riverside fairy shrimp will be offset by restoring 92 [0.96 ac (0.39 ha)] vernal pools onsite. Approximately 75 [0.64 ac

(0.26 ha)] and 17 [0.32 ac (0.13 ha)] of the restored vernal pools will support San Diego fairy shrimp and Riverside fairy shrimp, respectively. In addition, impacts to San Diego fairy shrimp in Vernal Pool 1, 35, 36 and 37 [0.07 ac (0.03 ha)] will be minimized by enhancing these pools, including: planting vernal pool indicator species in the pools, as appropriate; removing trash and debris; restoring maritime succulent scrub in the pools' watersheds and surrounding uplands; and removing a failing berm along the northern edge of Vernal Pool 1 (Table 4). Removing the berm from Vernal Pool 1 will create approximately 0.02 ac (0.008 ha) of additional vernal pool surface area and expand its watershed. The proposed enhancement is expected to improve the potential for sustaining San Diego fairy shrimp in these pools over the long term.

Six highly disturbed vernal pools (i.e., Pools 38 to 43) with a combined surface area of 0.01 ac (0.004 ha) will also be preserved and enhanced in the western portion of the site. Enhancement of these pools will include potential re-contouring and removing trash and debris. The restored pools, and enhanced pools as appropriate, will be inoculated with cysts salvaged from the impacted pools. An additional 0.2 ac (0.08 ha) of vernal pools will be restored and inoculated with fairy shrimp cysts (Table 4) to offset impacts to unoccupied pools. While not required, these additional pools will likely support fairy shrimp as well. Vernal pool restoration and enhancement will also include planting of vernal pool indicator plant species within the pools, and maritime succulent scrub in the pool watersheds and surrounding uplands. The long-term goal of the restoration and enhancement is to develop and preserve native habitats greater in area and superior in function to that presently on site.

Upon project completion, the enhanced and restored pools will be within a 17.86-ac (7.23-ha) onsite preserve that is connected to the MHPA in a configuration that maintains habitat functions and species viability.

Vernal pool enhancement, restoration, and/or monitoring activities may crush a minimal number of fairy shrimp cysts. To minimize potential impacts from these activities, cobbles will be oriented within the enhanced or restored vernal pools to serve as stepping stones.

The project proponent will also implement several other conservation measures to minimize impacts to San Diego fairy shrimp and Riverside fairy shrimp and to help ensure the success of vernal pool restoration, enhancement, and preservation and the upland habitat preservation efforts. Those efforts include: phasing project impacts so that the up to 20 pools (0.09 ac (0.04 ha) within the Candlelight Villas West footprint, including 14 pools [2,263 sq ft (0.05 ac)] occupied by the San Diego fairy shrimp (Table 2), will not be impacted until the vernal pool restoration/enhancement for the entire Candlelight Villas Project (i.e., East and West) has been installed for at least 2 years; fencing the limits of impacts; staffing a qualified biologist on site to ensure compliance with all conservation measures and submitting reports that document such compliance; grading all surrounding areas to drain away from the preserves; posting a financial assurance approved by the Agencies to ensure successful implementation of vernal pool restoration and enhancement, upland restoration and maintenance, and overall monitoring; conserving a 17.86-ac (7.23 ha) preserve that includes the vernal pools and their watersheds and surrounding upland habitat in biological conservation easements; and implementing and funding a perpetual management, maintenance and monitoring plan. Implementation of these and the other proposed conservation measures discussed above, along with the avoidance of some occupied fairy shrimp habitat, will avoid, minimize, and offset the direct effects of the project on individual San Diego fairy shrimp and Riverside fairy shrimp and their habitats and are expected to ensure the long-term viability of San Diego fairy shrimp and Riverside fairy shrimp populations at the project area.

The vernal pools on the project site are highly degraded and subject to ongoing threats due to lack of management. While some vernal pools will be permanently impacted, the identified restoration and enhancement is expected to achieve a "no net loss" of the San Diego fairy shrimp and Riverside shrimp populations on site and range-wide. Therefore, the proposed project is not expected to result in an appreciable reduction in the numbers, reproduction, or distribution of the San Diego or the Riverside fairy shrimp.

Indirect Effects

The proposed project will introduce development on the mesa top adjacent to 1) extant pools occupied by the San Diego fairy shrimp and proposed by this project to be preserved (i.e., Pools 1, 36 and 37) and 2) several new pools that are proposed to be restored and inoculated with San Diego fairy shrimp and Riverside fairy cysts (Figure 3, 4 and 5). These pools will be subject to potential edge effects that could impact the San Diego fairy shrimp and Riverside fairy shrimp within them, including: fragmentation; unauthorized dumping; human and pet intrusion; trampling; vandalism; plant and animal collection; runoff; erosion and siltation; spills and contamination; invasion of nonnative species; and/or increased OHV and bicycle activity. Although only a small buffer [i.e., 0 to 60 ft (0 to 18.3 m)] will be provided between these pools and the project footprint, the project has been designed to surround the pools on only one side allowing them to remain connected to the existing MHPA preserve. This design feature will greatly minimize the potential edge effects associated with the project. In addition, permanent fencing and signs will be installed around the development footprint to reduce human encroachment into the pools.

Vernal pool restoration/enhancement will occur in and around the preserved pools. The restoration will not impact the watersheds of extant pools and is expected to result in an increase in the amount of occupied San Diego fairy shrimp and Riverside fairy shrimp habitat. Overall, the potential indirect impacts of the proposed development on San Diego fairy shrimp and Riverside fairy shrimp and their habitat is expected to be addressed by the conservation measures committed to by the project proponent.

Impact on Recovery

While the remaining vernal pools on site are highly disturbed, many of them are occupied by San Diego fairy shrimp, one contains both Riverside and San Diego fairy shrimp, and other pools represent restorable habitat for both species. Thus, the onsite habitat has value to the recovery of the San Diego fairy shrimp and Riverside fairy shrimp because it supports the breeding, feeding, and sheltering needs of these species in some areas and also contains the appropriate soils needed to restore these critical functions in other areas.

As discussed above, since the vernal pool recovery plan has not yet been updated to address and clarify the suite of vernal pool complexes now known to support San Diego fairy and Riverside fairy shrimp, the Service is evaluating potential impacts to vernal pool complexes occupied by San Diego fairy shrimp and Riverside fairy shrimp on a project-specific basis to determine the impact of the project on the recovery of these species. For complexes that are not identified specifically in the vernal pool recovery plan, such as the complex at the Candlelight Villas project site, the Service has supported a conservation strategy[4] that allows impacts to disturbed, unmanaged vernal pools in exchange for preservation, restoration, and management of vernal pools in a biologically defensible configuration (e.g., substantial connection to biological open space, minimizes edge effects) that helps ensure their long-term viability and supports recovery of the species. Because the onsite habitat at the Candlelight Villas project site is highly disturbed with no management actions in existence or planned, the Service determined that following this same conservation approach would not preclude recovery of the San Diego or Riverside fairy shrimp.

Specifically, to avoid, minimize, and offset the project impacts, including eliminating 34 ac (13.8 ha) of occupied and restorable habitat (i.e., Olivenhain, Stockpen and Huerhuero soils on Otay Mesa), the project proponent reduced the project footprint such that some of the restorable vernal pool habitat will be maintained and also redesigned the project to allow the majority of the conservation to occur on the western portion of the project site (some conservation will also occur on the eastern portion of the project site). The western portion of the site was considered more suitable for restoration and enhancement actions because it is adjacent to an MSCP preserve and an existing vernal pool restoration area required by the Sweetwater High School District biological opinion (biological opinion 1-6-99-F-77) and it likely supported vernal pools historically.

The proposed restoration and enhancement will be consistent with vernal pool recovery plan Task 2 (i.e., to reestablish vernal pool habitat to historic structure and composition, and Task 3 (i.e., to rehabilitate and enhance secured vernal pool habitats and their constituent species). The vernal pool recovery plan also emphasizes the need to manage and monitor protected habitat (see Recovery Tasks 4 and 5). Consistent with these tasks, the onsite restoration and enhancement areas will be preserved and managed in perpetuity by a natural lands manager after the initial installation and 5-year monitoring period. The project is expected to result in a net increase in the acreage and quality of vernal pool habitat occupied by the San Diego fairy shrimp and Riverside fairy shrimp on Otay Mesa. Thus, the breeding, feeding, and sheltering functions of the existing onsite habitat to fairy shrimp will be replaced and improved, and the overall project will be consistent with the habitat protection and management goals outlined in the vernal pool recovery plan for the San Diego fairy shrimp and Riverside fairy shrimp.

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[4] For other projects using this approach, please refer to the Robinhood Ridge biological opinion 1-6-97-F-57; Calterraces biological opinion 1-6-95-F-35, and Sweetwater High School District biological opinion 1-6-99-F-77.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. We have not identified any State, Tribal, local, or private actions within the action area that should be considered in this biological opinion.

CONCLUSION

After reviewing the current status of the San Diego fairy shrimp and Riverside fairy shrimp, the environmental baseline for the action area, the effects of the action (Candlelight Villas Project East and West developments), and the cumulative effects, it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the San Diego fairy shrimp and Riverside fairy shrimp.

The Service reached this conclusion for the following reasons:

1. Impacts from both phases of the Candlelight Villas Project will affect only 1 of the 137 (less than 1 percent) vernal pool complexes known to support San Diego fairy shrimp within its U.S. range; and this same vernal pool complex represents only 1 of the 45 (about 2 percent) of the vernal pool complexes known to support the Riverside fairy shrimp within its U.S. range.

2. All of the individual pools to be impacted are highly degraded and subject to ongoing threats due to lack of management.

3. The loss of 0.38 ac (0.15 ha) (22 pools) supporting San Diego fairy shrimp, including 0.17 ac (0.07 ha) (1 pool) that also supports Riverside fairy shrimp, will be offset through preservation, restoration, enhancement and perpetual management of 96 [1.02 ac (0.41 ha)] vernal pools on site. Approximately 79 [0.7 ac (0.28 ha)] and 17 [0.32 ac (0.13 ha) of the restored and enhanced vernal pools will support San Diego fairy shrimp and Riverside fairy shrimp, respectively. This action is expected to result in almost three times the amount of San Diego fairy shrimp and Riverside fairy shrimp vernal pool habitat than now exists on site and to replace and improve the breeding, feeding, and sheltering functions of the existing onsite habitat for fairy shrimp.

4. The restoration and enhancement actions proposed likely will be successful because the restoration/enhancement will be implemented in an area that likely supported vernal pools historically (soil types necessary to sustain vernal pool habitat are present) and the methods proposed for this restoration/enhancement effort have been successful on an adjacent site.

5. The project supports recovery of the San Diego fairy shrimp and Riverside fairy shrimp because it is consistent with the overall habitat protection and management goals outlined for both species in the vernal pool recovery plan (Service 1998); specifically, the project is expected to result in a net increase in the acreage and quality of the vernal pools occupied by the San Diego fairy shrimp and Riverside fairy shrimp on Otay Mesa through the preservation, restoration, enhancement and management of a total of 96 [1.02 ac (0.41 ha)] vernal pools on site in a configuration that maintains habitat function and species viability.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary and must be implemented by the Corps and/or the Applicant (i.e., project proponent) in order for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity that is covered by this incidental take statement. If the Corps and/or Applicant (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

To monitor the impact of incidental take, the Corps and/or the Applicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

It is not possible to determine the precise number of San Diego or Riverside fairy shrimp that will be impacted by the proposed project. The exact population size of fairy shrimp species is difficult to estimate due to the dynamic conditions associated with their habitat. The reproductive success of fairy shrimp is dependent on seasonal fluctuations in their habitat, such as presence or absence of water during specific times of the year, duration of inundation, and other environmental factors that likely include specific salinity, conductivity, dissolved solids, and pH levels. Therefore, the population of fairy shrimp in any given pool varies dramatically.

We anticipate that San Diego fairy shrimp and Riverside fairy shrimp cysts in vernal pool habitat in the project footprint of the proposed Candlelight Villas project (East and West phases) will be taken in the form of harm by grading, excavating, and filling the basins they occupy and their watersheds. In addition, cysts will be salvaged from impacted pools, stored, and re-introduced into restored or enhanced pools. It is anticipated that some cysts will be killed during the salvage and restoration/monitoring effort. Because the precise number of individual San Diego fairy shrimp and Riverside fairy shrimp cysts harmed or killed cannot be determined, the take thresholds are set as follows:

- Out of the total 30 pools within the Candlelight Villas East project site, loss or substantial degradation (including grading, excavating, and filling occupied basins and project-related changes to basin hydrology that preclude San Diego fairy shrimp and Riverside fairy shrimp survival and reproduction) of 8 pools occupied by the San Diego fairy shrimp covering an estimated 0.33 ac (0.13 ha), including one 0.17-ac (0.07-ha) pool also occupied by the Riverside fairy shrimp. The take threshold at the Candlelight Villas East project site will be met if more than 8 pools or 0.33 ac (0.13 ha) of occupied San Diego fairy shrimp and Riverside fairy shrimp habitat are impacted, more than 8 pools are identified to support the San Diego fairy shrimp, or more than 1 pool is identified to support Riverside fairy shrimp.

- Out of the 20 pools within the Candlelight Villas West project site, loss or substantial degradation (including grading, excavating, and filling occupied basins and project-related changes to basin hydrology that preclude San Diego fairy shrimp survival and reproduction) of 14 pools occupied by the San Diego fairy shrimp covering an estimated 0.05 ac (0.02 ha). The take threshold at the Candlelight Villas West project site will be met if more than 14 pools or 0.05 ac (0.02 ha) of occupied San Diego fairy shrimp habitat are impacted, more than 14 pools are identified to support the San Diego fairy shrimp, or if any pools are identified to support Riverside fairy shrimp.

EFFECT OF THE TAKE

In the accompanying Opinion, the Service determined that this level of take is not likely to result in jeopardy to San Diego or Riverside fairy shrimp.

REASONABLE AND PRUDENT MEASURES

The project proponent is implementing significant conservation measures to avoid, minimize, and offset the incidental take of San Diego fairy shrimp and Riverside fairy shrimp during construction and implementation of the Candlelight Villas project. We have not identified any other measures that would further minimize this incidental take of these species. We believe the following reasonable and prudent measures are necessary and appropriate to monitor the incidental take of San Diego fairy shrimp and Riverside fairy shrimp and to provide a trigger for reinitiation of consultation, if necessary.

1. The Corps and/or project Applicant (project proponent) will monitor and report on compliance with the established take thresholds for San Diego fairy shrimp and Riverside fairy shrimp prior to and following construction impacting occupied pools at the Candlelight Villas East project site.

2. The Corps and/or project Applicant (project proponent) will monitor and report on compliance with the established take thresholds for San Diego fairy shrimp prior to and following construction impacting occupied pools at the Candlelight Villas West project site.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the Corps and/or project applicant must comply with the following terms and conditions, which implements the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1.1 If construction of the Candlelight Villas East phase of the project is not initiated within 2 years of issuance of this biological opinion, the Corps and/or Applicant (project proponent) will submit documentation to the Service prior to the initiation of project construction demonstrating that the distribution of San Diego fairy shrimp and Riverside fairy shrimp has not changed from the baseline condition described in this biological opinion (i.e., the number and distribution of pools occupied by San Diego fairy shrimp and Riverside fairy shrimp has not changed).

1.2 The Corps and/or Applicant (project proponent) will provide reports to the Service consistent with Conservation Measures 14g and 14h documenting the total number and acreage of pools occupied by the San Diego fairy shrimp and Riverside fairy shrimp within the project footprint at the Candlelight Villas East project site and demonstrating that authorized impacts to these species were not exceeded.

2.1 If construction of the Candlelight Villas West phase of the project is not initiated within 2 years of issuance of this biological opinion, the Corps and/or Applicant (project proponent) will submit documentation to the Service prior to the initiation of project construction demonstrating that the distribution of San Diego fairy shrimp has not changed from the baseline condition described in this biological opinion (i.e., the number and distribution of pools occupied by the San Diego fairy shrimp has not changed).

2.2 The Corps and/or Applicant (project proponent) will provide reports to the Service consistent with Conservation Measures 14g and 14h documenting the total number and acreage of pools occupied by the San Diego fairy shrimp within the project footprint at the Candlelight Villas West project site and demonstrating that authorized impacts to this species were not exceeded.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans or to develop information.

1. Wherever possible, for all projects involving vernal pools, the Corps should work with project applicants to establish a minimum 100-ft (30.5-m) wide habitat buffer to be preserved around vernal pools and their watersheds to limit the more immediate indirect edge effects caused by surrounding development and to ensure natural hydrological regimes are maintained.

2. The Corps should encourage the project proponent (Applicant) to restore maritime succulent scrub within the entire eastern preserve upland area to help ensure the long-term viability of Vernal Pool 1.

REINITIATION NOTICE

This concludes formal consultation on the development of the Candlelight Villas East and West Project, as outlined in the request for initiation. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions or concerns about this biological opinion, please contact David Zoutendyk of my staff at (760) 431-9440, extension 222

Sincerely,

Jim A. Bartel
Field Supervisor

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