I-805 HOV/ Carroll Canyon Project

Final Project Report

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PROJECT REPORT

In San Diego County in the city of San Diego on Route 805 from the Carroll Canyon Undercrossing to the Route 5 Junction and on Carroll Canyon Road from Scranton Road to Sorrento Valley Road.

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I have reviewed the right of way information contained in this Project Report and the R/W Data Sheet attached hereto, and find the data to be complete, current, and accurate:

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RIGHT OF WAY

11- SD - 805, R42.6/R46.2

This Project Report has been prepared under the direction of the following registered civil engineer. The registered civil engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

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Project Report

1. INTRODUCTION

The proposed Corridor Mobility Improvement Account (CMIA) project "I-805 HOV / Carroll Canyon extension Project" (**Attachment F**) includes north facing Direct Access Ramps (DARs) from Carroll Canyon Road extension to the median of Interstate 805 (I-805), construction of the Northbound (NB) and Southbound (SB) High Occupancy Vehicle (HOV) lanes from Mira Mesa Boulevard to the existing HOV lanes at Interstate 5 (I-5) station 470+30 805A Line, and the extension of Carroll Canyon Road. The north facing DAR is two-lane facility, which will be connected to HOV lanes at station 445+00 805A Line. The extension of the NB and SB HOV lanes includes pavement widening into the median area and the inside widening of the Mira Mesa Boulevard Undercrossing (UC) (Bridge No. 57-785 L/R) and Sorrento Valley Blvd UC (Bridge No. 57-786 L/R). The extension of Carroll Canyon Road includes construction of a new 0.83 kilometer four lane urban collector roadway with approximately 0.5 kilometers on structure and the remaining portion on fill. Additionally, a new local access road approximately 100 meters long will be constructed.

The total project capital costs are estimated at $91,700,000 (current cost). State funding through the CMIA in the amount of $57.5 million has been identified for this project. The remaining costs for this $102 million project would be funded through local and regional sources. Specifically, $32.8 million would come from regional *TransNet* funds and $11.7 million from local funds. Construction is tentatively scheduled to begin in October 2009 (Fiscal Year 2009/10) and end in March 2011.

2. RECOMMENDATION

The Preferred Alternative (I-805 HOV /Carroll Canyon Extension) for this project has been presented to the affected local agency, the City of San Diego. The local agency's views and concerns have been addressed and they are in general accord with the project presented in this project report. The California Department of Transportation (Department) recommends that this project be approved using the Preferred Alternative, and that the project proceed to the design phase.

3. BACKGROUND

A. Project History

The DAR and HOV Extension portion of this project was initiated by a Memorandum of Understanding (MOU) between the Department and the City of San Diego in order to accommodate the future operational demands on the interchange facility as a result of on-going industrial/commercial growth in the area. The Project Development Team (PDT), with the Department's guidance, recognized that highway solutions alone could not feasibly address the interchange's transportation needs and deficiencies and therefore looked to multi-modal solutions. A Project Study Report (PSR) was completed in September 2007 and identified four build scenarios and a no build scenario. These scenarios included operational improvements,

DARs at Carroll Canyon Road and northerly extension of the HOV lanes, an intermodal transit center, and relocation of the existing commuter rail station. The Carroll Canyon DARs and HOV extension was chosen for Congestion Management Improvement Account funds and is therefore being completed.

Carroll Canyon Road is a partially constructed east-west roadway located south of Mira Mesa Boulevard. The Mira Mesa Community Plan (1992) identifies a future six-lane arterial/major road from Sorrento Valley Road to Interstate 15 (I-15) (approximately 5.5 miles). A one-mile segment of Carroll Canyon Road currently operates as a four-lane major road from Scranton Road to Pacific Heights Boulevard. Within the project area, the City of San Diego had developed a project to extend Carroll Canyon Road under I-805 from Scranton Road to Sorrento Valley Road. This roadway extension project had an approved environmental document and was in final design. However, the Department determined the projects were inextricably linked because the DAR would require the City of San Diego to raise the elevation of Carroll Canyon to meet the new interchange. Thus, Department staff requested to include the existing City of San Diego Carroll Canyon project in the I-805 DAR and HOV Extension project. The project then became known as the I-805 HOV/Carroll Canyon Extension Project and would then have one environmental document covering the entire project area.

Long-range regional and corridor planning endeavors have identified I-805 as a future HOV/Managed Lanes corridor. A Corridor Study and Project Study Report identified a future four-lane HOV facility in the median of I-805 from Chula Vista to Sorrento Valley. This HOV facility would be "managed" to optimize operations, encourage ridesharing and support future regional transit. A major feature of Managed Lanes facilities are DARs, which provide direct access from the freeway median to local circulation systems without disrupting freeway mainline operations. As a result of the large employment base and strategic location on the planned HOV/Managed Lanes system, DARs have been identified to serve Sorrento Valley/ Golden Triangle. The proposed Carroll Canyon DAR serves as the northern terminus of the future HOV/Managed Lanes facility on I-805, as well as the southern terminus of the future four-lane HOV/Managed Lanes facility on I-5 from I-805 to Oceanside. The Carroll Canyon DAR also serves as the transition point between the four-lane HOV/Managed Lanes facility and the two-lane HOV facility on I-805 that is required in order to transition into the I-5/I-805 Junction to the north.

B. Community Interaction

The project area is also part of the North Coast Interstate 805 HOV/Managed Lanes Project (North Coast Project). The alternatives have been discussed with Caltrans District 11 and Headquarters throughout the project development process to ensure that the I-805 DAR/HOV Extension Project would not preclude implementation of the North Coast Project. Monthly Project Development Team (PDT) meetings have occurred since February 2003.

There is strong support for the proposed improvements from regional and local governments. The project is supported by the Department (District 11), SANDAG, and the City of San Diego.

C. Existing Facility

The existing Mira Mesa Boulevard interchange was constructed as part of the original I-805 freeway facility in the early 1970s and is the most northerly local interchange on I-805. The

interchange opened to traffic as a partial cloverleaf for southbound movements and a diamond for northbound movements. The interchange was improved in the early 1990s, including construction of a new exit hook ramp for northbound traffic, conversion of a diamond ramp to a hook ramp, minor realignment of one ramp, and various ramp widenings.

Mira Mesa Boulevard, constructed with the interchange, is a major east-west arterial extending approximately six miles from the commercial/industrial areas of Sorrento Mesa easterly towards the residential community of Mira Mesa and I-15. Originally a two-lane roadway, Mira Mesa Boulevard has been improved to a six-lane facility to accommodate the residential and commercial/industrial growth along the corridor. Recent growth and densification of office and commercial land uses in Sorrento Mesa has led to the widening of the western section of Mira Mesa Boulevard from Scranton Road to I-805 to eight travel lanes.

Just west of the interchange, Mira Mesa Boulevard transitions into Sorrento Valley Road, a four-lane east-west facility serving Sorrento Valley. Land uses along Sorrento Valley Road include low-density commercial and light industrial campuses. Sorrento Valley Road provides southerly freeway access to I-5 via Sorrento Valley Boulevard and Roselle Street.

I-805 is a major north-south freeway beginning at its southern junction with I-5 near the international border with Mexico and continuing approximately 45 km (28 miles) north where it again joins with I-5 in the northern area of the City of San Diego in the vicinity of Sorrento Valley, as shown on **Attachment A**: Project Vicinity and Location Maps. I-805 is primarily an eight-lane freeway with various auxiliary lanes throughout the facility that generally runs parallel to I-5, traversing the central portion of the San Diego urbanized area. I-805 is a heavily utilized route for commuters, goods movement, and as a bypass for downtown San Diego. It provides access to numerous employment centers along the corridor; including Kearny Mesa, University City and Sorrento Valley area.

Located just north of the project area is the northern junction of I-5 and I-805. At this complex freeway junction, the I-805 transitions directly into the I-5 alignment. As part of a recent project to widen this complex freeway junction, a 0.32 km (0.2-mile) HOV lane was constructed at the terminus of I-805 to provide a seamless transition into the HOV lanes constructed on I-5 to the San Dieguito River. Within the project limits, the I-805 median is approximately 11 m (36 ft) wide (including shoulder widths). Metal Beam Guard Rail is located on each side of the shoulder (east and west) in the median.

The existing structural section is shown in Table 3.1. The existing pavement is in good condition and does not require any rehabilitation at this time.

Table 3.1 Existing Structural Section

Outside Shoulder	Traveled Way	Median Shoulder
92 mm AC	212 mm PCC	76 mm AC
136 mm AB	136 mm CTB	136 mm AB
288 mm-167 mm AS	167 mm AS	288 mm-116 mm AS

Existing utilities within the project limits include overhead Power Line crossing from east to west of I-805, owned by San Diego Gas & Electric (SDG&E).

Northbound Direction

From the north end of the Mira Mesa Boulevard Bridge to the I-5/805 merge, existing I-805 consists of: a left shoulder approximately 0.6 m wide, four general-purpose lanes (lane number

one approximately 3.6 m wide, lane numbers two, three, and four, which are 3.3 m each, lane number five approximately 3.6 m wide), a 3.6 m auxiliary lane, and a right shoulder approximately 3.0 m wide, as shown in the typical cross sections, **Attachment E**. It should be noted that the existing NB HOV lane terminates at approximately 35 m north of the I-5/805 Bridge.

Southbound Direction
From the I-5/805 merge to Mira Mesa Boulevard SB Entrance Ramp, I-805 has a 2.4 m (8 ft) left shoulder, three 3.6 m (12 ft) general-purpose lanes, two Aux lanes and a 3.0 m (10 ft) right shoulder, as shown in the typical cross sections, **Attachment E.**

Metal Beam Guardrail (MBGR) on the Freeway Median
Metal Beam Guardrails (MBGR) were placed left and right of the median in a project that included the segment from La Jolla Village Drive/Miramar Road OC to the I-5/805 junction during the early 1980s.

Structures
Currently, the Mira Mesa Boulevard UC consists of two separate structures (Bridge No. 57-785L, and Bridge No. 57-785R). The existing structures were built in 1964, and were retrofitted in 1983. They are three span structures, with Reinforced Concrete (RC) Box Girder at the center span, and RC T-Beams for the two end spans. The overall length of the structures is approximately 45 m, and the width of the structures varies, ranging from approximately 23 m to 24 m. The structures were supported on bin type abutments with spread footings. Closure walls (front walls) were provided at the exterior faces of the bin abutments, but no closure walls were constructed for the sides adjacent to the median area. For seismic retrofitting, earthquake cable restrainers were built to tie the RC Box Girders and RC T-Beams, in such a way that all spans would move together as a unit during a seismic event.

Currently, the Sorrento Valley Boulevard UC consists of two separate structures (Bridge No. 57-786L, and Bridge No. 57-786R). The existing structures were built in 1964, and were retrofitted in 1983. They are three span structures, with Reinforced Concrete (RC) Box Girder at the center span, and RC T-Beams for the two end spans. The overall length of the structures is approximately 45 m, and the width of the structures varies, ranging from approximately 23 m to 24 m. The structures were supported on bin type abutments with spread footings. Closure walls (front walls) were provided at the exterior faces of the bin abutments, but no closure walls were constructed for the sides adjacent to the median area. For seismic retrofitting, earthquake cable restrainers were built to tie the RC Box Girders and RC T-Beams, in such a way that all spans would move together as a unit during a seismic event.

4. PURPOSE AND NEED

A1. Project Purpose

The purpose of this project is to improve freeway and interchange operations, improve local traffic circulation within Sorrento Valley, and to provide mass transit users and carpools with dedicated access to job centers in Sorrento Valley.

In an effort to meet this purpose, the objectives of the proposed project are to:

- Provide local traffic an additional access to the Sorrento Valley area via the Carroll canyon DARs and Carroll Canyon Road extension.

- This new access would relieve congestion currently occurring at the Mira Mesa Boulevard/Sorrento Valley Road interchange.

- Extend the southerly terminus of the existing I-5 HOV lanes from the I-5/I-805 interchange to a major regional business destination.

- Provide HOV lane continuity with the existing I-5 HOV lanes along I-5 to the north as well as planned HOV lanes to the south along I-805.

- These improvements support the region's transportation objectives.

- Support regional objectives by promoting the use of carpooling and transit, as well as being compatible with future proposed Bus Rapid Transit (BRT).

The project operates independent of reasonably foreseeable transportation improvements and would not preclude future project alternatives.

A2. Need

The Mira Mesa Boulevard/Sorrento Valley Road Interchange on I-805 is located in the Sorrento Valley community in the City of San Diego. Sorrento Valley and surrounding areas comprise one of the largest employment centers in the San Diego region. This area accounts for approximately six percent of the region's employment base, which is comparable to San Diego's central business district.

The Mira Mesa Boulevard interchange is the primary access for commuter traffic into Sorrento Valley, which includes the growing eastern sub-areas of Sorrento Mesa and Carroll Canyon. The area provides over 46,000 jobs, many of which are high technology companies (e.g., Qualcomm, Gen-Probe, etc.) that drive the regional economy. Forecasts indicate that employment in the Sorrento Valley area will increase to 51,000 jobs by the year 2030, an 11 percent increase.

The Mira Mesa Boulevard interchange is the most northerly local interchange on I-805 before the freeway transitions into I-5 at its northern junction two miles away. The interchange provides the only direct northerly freeway access to I-805 and I-5 from Sorrento Valley. Due to the coastal topography typical of the region, Sorrento Valley is geographically constrained to the north, west and south. Subsequently, the local circulation system serves Mira Mesa Boulevard and Sorrento Valley Road and offers limited regional mobility alternatives to I-805. Over the last decade, rapid employment growth in Sorrento Valley has resulted in increased demands on the interchange and the surrounding local circulation system. The result has been peak period congestion that has degraded travel times between Sorrento Valley employment sites and I-805 for both Single Occupancy Vehicle (SOV) and HOV. HOV Lanes provide additional highway capacity by increasing the number of occupants per vehicle and give carpool users and bus riders more consistent travel times during peak periods. HOV can serve as an incentive for ridesharing, and reduce congestion.

A3. Justification

Recurrent traffic congestion and delay on I-805 has been well documented over the past few years in both the northbound and southbound directions within the project limits. The traffic congestion occurs from the I-805/I-5 merge to the University City area of the City of San Diego. Local circulation is also experiencing substantial delay at intersections during peak period hours of the day. Numerous intersections experience vehicle delay of greater than 55 seconds. Specifically, at the intersection of Mira Mesa Boulevard and Vista Sorrento Pkwy/I-805 northbound off Ramp vehicles are experiencing delays of 194 seconds (3.5 minutes) in the AM peak period and over 100 seconds of delay at the intersection of Mira Mesa Boulevard and Scranton Road in both peak periods. This data are presented in Table 4.4 Existing Intersection Operations.

The proposed project will provide operational improvements by extending the northbound and southbound HOV lanes from the I-5/805 merge to the Mira Mesa Boulevard Bridge and connect to new DARs, which terminate at Carroll Canyon Road, see **Attachment A**. Termination of the existing HOV lanes, coupled with high traffic volumes result in recurrent congestion and a deficient operation of I-805. Extension of the HOV lanes would provide continued HOV service from the I-5 Manchester Interchange to Carroll Canyon Road and reduce the recurrent traffic congestion occurring in both northbound and southbound I-805 though the project limits. The addition of the DAR will provide access to the HOV lanes within the project area and serve to reduce congestion at local street intersections by redirecting HOV users to Carroll Canyon from Mira Mesa Boulevard interchange.

Currently the ADT of the southbound loop on ramp at Mira Mesa Boulevard is 27,700 and the southbound diamond on ramp from Sorrento Valley Road is 5,500. The extension of Carroll Canyon with the addition of the DAR will balance the ADT and peak hour congestion of the two southbound entrance ramps by redirecting vehicles to Carroll Canyon Road via Scranton Road from Mira Mesa Boulevard and therefore improve the operation of the intersection at Vista Sorrento Parkway and Mira Mesa Boulevard and the interchanges at Sorrento Valley Rd and Mira Mesa Boulevard.

Furthermore, the extension of Carroll Canyon Road will help improve local traffic circulation in the Sorrento Valley area by redirecting HOV users away from Mira Mesa Boulevard, thus reducing congestion at local intersections. If the proposed project were not completed, 2030 vehicle delay at seven of the eleven project area intersections would be more than 55 seconds with over half of those experiencing delays over 100 seconds in either the AM or PM peak period. Specifically, the intersection of Sorrento Valley Road and I-805 southbound off ramp/Carroll Canyon Road would experience 45 seconds of delay in the AM peak and 189 seconds (3.15 minutes) of delay in the PM peak. Completion of the proposed project would reduce those delays 13 and 48 seconds respectively. Similar reductions in intersection delay would be realized throughout the project area.

B. Regional and System Planning

System Identification

I-805 is an eight/ten-lane freeway beginning at the south junction with I-5 near the Mexico Border at San Ysidro and continuing 46.5 km (28.9 miles) north, where it again joins with I-5 in

the northern area of the City of San Diego. The route runs roughly parallel to I-5, and traverses the central portion of the San Diego urbanized area. I-805 is located completely within San Diego County.

I-805 was added to the California Freeway and Expressway (F&E) System in 1959 as Legislative Route Number 241. The route was approved as a chargeable interstate in 1958, adopted as a freeway in September 1960, and declared a signed state route in 1964. The route was built between 1970 and 1975, and was named after Jacob Dekema, a former director of the California Department of Transportation who helped shape the San Diego freeway system.

All of I-805 is included in the National Highway System (NHS). The National Highway System Designation Act of 1995 was enacted by Congress to provide an integrated national highway system that serves both urban and rural America; to connect major population centers, international border crossings, ports, airports, public transportation facilities, and other major travel destinations; to meet national defense requirements; and to serve interstate and interregional travel. The NHS includes the Interstate System routes.

The entire length of I-805 is designated as a Surface Transportation Assistance Act (STAA) State Highway Terminal Access Route. In accordance with the Truck Kingpin-to-Rear-Axle Length State Highway System Evaluation Report of December 1989, routes in this system are identified as geometrically adequate for use by truck tractor semi-trailer combinations having a 40-foot kingpin-to-rear-axle length. In addition, the section of this route from I-15 to the northern junction with I-5 is part of the Subsystem of Highways for the Movement of Extralegal Permit Loads (SHELL), and the Intermodal Corridors of Economic Significance (ICES) system. The ICES system emphasizes corridors that are most essential to the California economy in terms of national and international trade.

State Planning

The 2006 California Transportation Plan (CTP) is a long-range transportation policy plan that explores the social, economic, and technological trends and demographic changes anticipated over the next 20 years and their potential influence on travel behavior. The CTP provides a vision for California's future transportation system and defines goals, policies, and strategies to achieve the vision. The CTP proposes a balanced approach to the projected increase in demand for mobility and accessibility. By providing a common framework for decision makers at all levels of government and the private sector, the CTP seeks to guide transportation decisions and investments that will enhance our economy, support our communities, and safeguard our environment for the benefit of all

Both the 1999 I-805 Transportation Concept Report (TCR) and the updated August 2007 I-805 Transportation Concept Summary (TCS) include the provision for HOV/Managed/Added lanes on I-805 between SR-52 and the I-5 north junction. This project is also included in the *District 11 HOV System Plan* and the *SANDAG 2007 RTP*. It is also part of a project on I-5 which will build HOV/Managed/Added lanes from the I-5/I-805 separation to State Route 76 (SR-76).

The 1996 District System Management Plan (DSMP) provides multimodal, multi-jurisdictional system strategies for evaluating and recommending improvements to the transportation system and recognizes the complex relationship between transportation, land use and air quality. The DSMP also emphasizes serving the largest number of people, not vehicles, and bases transportation improvements on an analysis of the most appropriate mode or modes. This project is consistent with the DSMP.

GoCalifornia is a mobility action plan designed to decrease congestion, improve travel times, and increase safety, while accommodating future growth in the population and the economy. *GoCalifornia*, now part of the Governor's Strategic Growth Plan, is an ambitious 10-year effort to invest the resources needed to significantly decrease congestion below today's levels. This effort will require innovation in transportation planning, project development and management, design, construction, and system management; sustained coordination between regional transportation agencies and the State; and dedicated funding.

Governor Arnold Schwarzenegger's Strategic Growth Plan (SGP) calls for a $222 billion infrastructure improvement program to fortify the state's transportation system, education, housing, and waterways. The SGP includes a historic and comprehensive transportation investment package designed to decrease congestion, reduce travel times, and increase safety, while accommodating future growth in the population and the economy.

The SGP deploys demand-management strategies, such as dedicated truck lanes and high occupancy toll lanes, and builds new capacity. It will enable more traffic to move through existing roadways, rehabilitate thousands of lane miles of roads, add new lanes, and increase public transportation ridership. This requires innovation in transportation planning, construction and management, sustained coordination between regional transportation agencies and the state, and dedicated funding.

The SGP presents a bold vision of mobility improvements and investments. The initiative is performance-based and outcome driven, targeting significant reduction in congestion, improved quality of life for Californians, and a world-class transportation system that supports a globally-competitive economy and promotes prosperity. This project is consistent with this vision.

Regional Planning

The San Diego Association of Government's (SANDAG's) 2007 Regional Transportation Plan (RTP) includes the following corridor improvements under the Revenue Constrained Plan, the Reasonably Expected Revenue scenario, and the Unconstrained Needs Network:

Table 4.1 Highway Scenarios

LOCATION	REVENUE CONSTRAINED	REASONABLY EXPECTED	UN-CONSTRAINED
I-8 to SR-52	8F +2 HOV	8F+4ML	10F+4ML
SR-52 to La Jolla Village Dr	8F+4ML	8F+4ML	10F+4ML
La Jolla Village Dr to Carroll Canyon Rd	8F+4ML	8F+4ML	8F+4ML
Carroll Canyon Rd to I-5 North	8F +2 HOV	8F+4ML	8F+4ML

F= Freeway Lanes HOV= High Occupancy Vehicle Lanes ML= Managed Lanes

Table 4.2 HOV Connectors

LOCATION	REVENUE CONSTRAINED	REASONABLY EXPECTED	UNCONSTRAINED
SR-52: W to N, S to E	Y	Y	Y
SR-163, N to N and S to S	N	N	Y

The project is in the SANDAG 2030 RTP (Tables A.1 and A.2) which was fully-funded and found to be conforming by Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) on December 10, 2007. The project was also included in the conforming SANDAG 2006/2011 Regional Transportation Improvement Program (RTIP) (CAL09C). The project was carried forward into the SANDAG 2008/2013 RTIP (CAL09C) which was found to be conforming by FHWA/FTA on November 17, 2008. FHWA/FTA also redetermined conformity of the 2007 RTP on that date. Project design concept and scope are also consistent with the project description in the above RTP and Federal Transportation Improvement Plan (FTIP).

Local Planning
This project is consistent with the City of San Diego's Local Coastal Plan, the Air Quality Control Plan, and the Non-Motorized Master Plan. For more information regarding these plans, please see the environmental document.

Transit Operator Planning
In 2001, SANDAG adopted its Regional Transit Vision (RTV) for the San Diego region, implementing a market-based approach to expanding future local and regional transit services. The new vision for transit in the San Diego region included regional and corridor-based express BRT services that would utilize future HOV/Managed Lanes on freeways and signal priority and/or dedicated lanes on local streets and arterials. As part of the RTV, a transit concept for corridor-level service (known as "Red Car") from San Diego to eastern Oceanside was established. This "Red Car" service concept included from employment access to University Towne Centre (UTC) and Sorrento Valley, with limited-stop express service on I-5 via I-805 and "station"-like environments on El Camino Real spaced every mile. This project would enhance the opportunity for BRT service in the project area.

C. Traffic

Traffic volumes and related freeway operations are provided in this section for existing conditions (2006), future year 2010 (opening day), and future year 2030. The forecasted 2010, and 2030-year volumes are based on the SANDAG Regional Travel Demand Model Series 10, 2030-year forecast. Analysis of the freeway operations includes a comparative review of the freeway main lane capacity Levels of Service (LOS) for the existing conditions, the opening day conditions in the year 2010, and the future conditions in the year 2030, see **Attachment H**.

Current and Forecasted Traffic
Currently, I-5 HOV lanes exist in both the NB and SB directions and begin immediately north of the I-5/805 junction, continuing to just before the I-5/Via De La Valle interchange. The SB and NB HOV lanes are under construction to be extended to the Manchester Avenue Interchange.

Recurrent traffic congestion and delay has been well documented over the past few years in both the NB and SB directions of I-805 within the project limits. Evaluation of PeMS[1] traffic data within the project limits indicates that there is a critical bottleneck in the NB direction of I-805 between the I-52/805 interchange and the I-5/805 Junction. The average duration of congestion

[1] The Freeway Performance Measurement Project is a project to investigate various performance measures on the freeway system. The software that has been developed in conjunction with this project, the Performance Measurement System (PeMS), is a traffic data collection, processing and analysis tool. It is a cooperative effort between the University of California at Berkeley (UC Berkeley), the Partnership for Advanced Technology on the Highways (PATH), and Caltrans. (Source: http://pems.eecs.berkeley.edu)

(speeds less than 35 miles per hour) on NB I-805 lasts approximately 3 hours during the weekday (Monday – Friday) AM peak commutes. The traffic data also shows the existence of critical bottlenecks in the SB direction from I-5/805 Junction to the I-52/805 Interchange. In the SB direction, I-805 drivers experience approximately 2 hours of congestion during the weekday PM. peak commutes.

Existing traffic volumes for the project limits on both NB and SB I-805, including HOV lane volumes are shown in Figure 9A. Existing volumes on the freeway main lanes vary from 6200 to 9600 vehicles per hour during the AM Peak hour in the NB direction, and from 6400 to 8900 vehicles per hour during the PM peak hour in the SB direction. The Traffic Study completed on November 25, 2008, reports existing Levels of Service (LOS) ranging from LOS B to LOS F in both the NB and SB directions within the project limits.

The proposed project will provide operational improvements by extending the northbound and southbound HOV lanes from the I-805/Mira Mesa Boulevard Interchange to the existing HOV lanes at I-5/805 Junction.

Traffic volumes for the future years 2010 and 2030 have been included in Attachment F Traffic Study. The scheduled opening day for the I-805 HOV Extension project is in the year 2011. The scheduled early completion date for the future I-805 North Coast HOV/Managed Lanes Project is in the year 2015. It should be noted that the traffic volumes on the main lanes are initially lower in the future years since the HOV traffic that is currently driving on the existing main lanes would be shifted to the new HOV lanes in the future years.

TABLE 4.3 - LEVEL OF SERVICE (LOS) DESCRIPTIONS

Level of Service (LOS)	General Description	Signalized Intersection Description
A	Primarily free-flow operations. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream.	< 10 Sec. Delay
B	Vehicles operations are reasonably unimpeded. There is only a slight restriction on the ability to maneuver within the traffic stream.	> 10 and < 20 Sec. Delay
C	Stable operation is provided, but flows approaching the range at which an increase in volume immediately results in a deterioration of service. Drivers are definitely restricted in making maneuvers such as lane changes.	> 20 and < 35 Sec. Delay
D	Operation is approaching unstable flow. Motorists are severely restricted in carrying out maneuvers such as lane changes.	> 35 and < 55 Sec. Delay
E	Flow at this level is unstable. Maneuvers such as lane change or merging of traffic from entrance ramps will result in a disturbance of the traffic stream.	> 55 and < 80 Sec. Delay
F	Operation under this level of service is under forced or breakdown conditions and uniform moving flow cannot be maintained. The flow conditions are such that the number of vehicles that can pass a point is less than the number of vehicles arriving at the point.	> 80 Sec. Delay

- As seen in *Table 4.4*, all intersections near this interchange currently operate at LOS D or better during the AM and PM peak hours except at the following intersections:
- Mira Mesa Boulevard/Vista Sorrento Parkway/I-805 Northbound Off Ramp (LOS F during AM peak hour)
- Mira Mesa Boulevard/Scranton Road (LOS F during the AM and PM peak hour)
- Mira Mesa Boulevard/Pacific Heights Boulevard (LOS F during the AM and PM peak hour)
- Vista Sorrento Parkway/I-805 Northbound Hook Ramps (LOS E during the AM peak hour)

TABLE 4.4 - SIGNALIZED INTERSECTION OPERATIONS

Intersection	Peak Hour	Existing (Year 2005) Delay	Existing (Year 2005) LOS	No-Build (Year 2030) Delay	No-Build (Year 2030) LOS
Sorrento Valley Rd/ I-805 SB Off ramp/Carroll Canyon Rd.	AM	19.5	B	45.0	D
	PM	27.3	C	**188.8**	**F**
Mira Mesa Blvd/ Vista Sorrento Pkwy/ I-805 NB Off ramp	AM	**194.5**	**F**	**106.1**	**F**
	PM	34.5	C	27.4	C
Mira Mesa Blvd/ Scranton Rd	AM	**105.8**	**F**	**108.9**	**F**
	PM	**129.0**	**F**	**87.4**	**F**
Mira Mesa Blvd/ Lusk Blvd	AM	16.6	B	22.7	C
	PM	37.2	D	29.3	D
Mira Mesa Blvd/ Pacific Heights Blvd	AM	**83.1**	**F**	**57.7**	**E**
	PM	**114.4**	**F**	**201.4**	**F**
Mira Sorrento Pl/Scranton Rd	AM	12.8	***B***	**106.4**	**F**
	PM	19.5	C	**100.6**	**F**
Oberlin Dr/ Scranton Rd	AM	21.9	C	41.3	D
	PM	33.0	C	**64.2**	**E**
Carroll Canyon Rd/ Scranton Rd	AM	N/A	N/A	17.8	B
	PM	N/A	N/A	19.1	B
Vista Sorrento Pkwy/I-805 NB Ramps	AM	**56.1**	**E**	**68.6**	**E**
	PM	39.7	D	**60.3**	**E**
Morehouse Dr/ Scranton Rd	AM	27.9	C	30.6	C
	PM	40.7	D	38.4	D

Traffic studies indicate that without transportation improvements, the following intersections will operate at LOS D or better during the AM and PM peak hours in the year 2030 except:

- Sorrento Valley Road/I-805 Southbound Off-Ramp/Carroll Canyon Road (LOS F during the PM peak hour)
- Mira Mesa Boulevard/Vista Sorrento Parkway/I-805 Northbound Off Ramp (LOS F during AM peak hour)
- Mira Mesa Boulevard/Scranton Road (LOS F during the AM and PM peak hour)

- Mira Mesa Boulevard/Pacific Heights Boulevard (LOS E during the AM peak hour and LOS F during the PM peak hour)
- Mira Sorrento Place/Scranton Road (LOS F during the AM and PM peak hour)
- Oberlin Drive/Scranton Road (LOS E during the PM peak hour)
- Vista Sorrento Parkway/I-805 Northbound Hook Ramps (LOS E during the AM and PM peak hour)

An additional analysis of State-owned intersections was completed using the Intersecting Lane Vehicles (ILV) methodology as described in Chapter 400, Topic 406 of the Department Highway Design Manual. The ILV methodology is based on the concept that the capacity of intersecting lanes of traffic is 1,500 vehicles per hour. For the typical local street interchange there is usually a critical intersection of a ramp and the crossroads that establishes the capacity of the interchange. Table 4.5 lists the values of ILV/hr for various traffic flow conditions.

TABLE 4.5 – INTERSECTING LANE VEHICLE (ILV) DESCRIPTIONS

Rating	Description
Under Capacity *(ILV/hr<1200)*	Stable flow with slight, but acceptable delay. Occasional signal loading may develop. Free mid-block operations.
At Capacity *(LV/hr 1200 – 1500)*	Unstable flow with considerable delays possible. Some vehicles occasionally wait two or more cycles to pass through the intersection. Continuous backup occurs at some approaches.
Over Capacity *(ILV/hr >1500)*	Stop and go operation with severe delay and heavy congestion. 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.

Table 4.6 summarizes the ILV analysis results for the signalized intersections on I-805 at Mira Mesa Boulevard/Sorrento Valley Road interchange ramps. As seen in *Table 3.4*, nearly all intersections currently operate "At Capacity" or "Over Capacity" during both AM and PM peak hours.

TABLE 4.6 - CALTRANS ILV METHOD INTERSECTION OPERATIONS

Intersection	Scenario	AM		PM	
		ILV	Capacity	ILV	Capacity
I-805 SB Off-Ramp / Sorrento Valley Rd	Existing (Year 2005)	***1121***	***Under***	***1227***	***At***
	No-Build (Year 2030)	***1890***	***Over***	***2070***	***Over***
I-805 NB Off-Ramp / Mira Mesa Blvd / Vista Sorrento Pkwy	Existing (Year 2005)	***2182***	***Over***	***1853***	***Over***
	No-Build (Year 2030)	***1958***	***Over***	***1796***	***Over***
I-805 NB Off-Ramp / Vista Sorrento Pkwy / Mira Sorrento Pl	Existing (Year 2005)	***1506***	***Over***	***1326***	***At***
	No-Build (Year 2030)	***1730***	***Over***	***1650***	***Over***

Traffic studies indicate that without transportation improvements, all intersections will operate "Over Capacity" during both AM and PM peak hours in the year 2030.

TABLE 4.7 - EXIT RAMP QUEUE LENGTHS

Off-Ramp Location	Model Run: Scenario	Off ramp 95 Percentile Queue Length (ft)					
		AM			PM		
		Left	Through	Right	Left	Through	Right
I-805 NB Off-Ramp to Vista Sorrento Pkwy	Existing (Year 2005)	**820**	-	50	**270**	-	20
	No-Build (Year 2030)	560	480	110	310	290	50
I-805 NB Off-Ramp to Mira Mesa Blvd	Existing (Year 2005)	-	150	**1550**	-	140	**450**
	No-Build (Year 2030)	-	120	1480	-	100	220
I-805 SB Off ramp to Sorrento Valley Rd	Existing (Year 2005)	370		80	**370**	-	40
	No-Build (Year 2030)	290	450		540	310	

General Notes: Source: Synchro Analysis. Queue lengths rounded to nearest 10 feet. Queue lengths corresponding to volumes which exceed capacity are indicated in **bold**.

Traffic studies indicate that without transportation improvements, all the street segments will operate at LOS D or better during the AM and PM peak hours in the year 2030 except:

Carroll Canyon Road, east of Scranton Road (LOS E)

Freeway Facilities
All freeway segments in the project area currently operate at LOS D or better with the following exceptions:

I-805 Northbound, South of Mira Mesa Boulevard Interchange (LOS F (0) in the AM peak hour when the total number of lanes is 4M + 1A)[2]

I-805 Southbound, South of Mira Mesa Boulevard Interchange (LOS E in the PM peak hour when the total number of lanes is 4M + 1A)

Traffic studies indicate that with no improvements other than future planned freeway improvements on I-805, the freeway segments identified above will continue to operate at LOS E or worse during the AM and PM peak hours in the year 2030.

Merge Sections
All freeway on-ramp merge segments in the project area currently operate at LOS D or better with the following exceptions:

I-805 Southbound On-ramp from Mira Mesa Boulevard (LOS F during PM peak hour)
I-805 Southbound On-ramp from Sorrento Valley Road (LOS F during PM peak hour)

Traffic studies indicate that without transportation improvements, all the on-ramp merge segments in the project study area will operate at LOS D or better during the AM and PM peak hours in the year 2030.

[2] 4M + 1A signifies four main lanes and one auxiliary lane in each direction.

Diverge Sections
All freeway off-ramp diverge segments in the project area currently operate at LOS D or better with the following exceptions:

I-805 Northbound Off-ramp to Vista Sorrento Parkway (LOS E during AM peak hour)
I-805 Northbound Off-ramp to Mira Mesa Boulevard (LOS F during AM peak hour)

Traffic studies indicate that without transportation improvements, the off-ramp diverge segments identified above will continue operate at LOS E or worse during the AM and PM peak hours in the year 2030.

Ramp Meters
All freeway ramp meters in the project area currently operate at acceptable conditions or better with the following exceptions (Note: Ramp meters are assumed to be operating at acceptable conditions if the traffic peak hour demand/lane/hour is less than the maximum meter rate):

I-805 Southbound On-ramp from Mira Mesa Boulevard
I-805 Northbound On-ramp from Vista Sorrento Parkway

Traffic studies indicate that without transportation improvements, all the freeway ramp meters in the project area will operate at acceptable conditions or better in the year 2030 with the following exception:

I-805 Northbound On-ramp from Vista Sorrento Parkway

Accident Rates
The TASAS Table 'B' accident report for a five-year period for the Mira Mesa Boulevard interchange and the I-805 main lanes from December 2002 to November 2007 indicates the following accident rates:

TABLE 4.8 - ACCIDENT DATA for I-805 RAMPS AT MIRA MESA BLVD INTERCHANGE

Segment	Total No. of Accidents	Actual Rates / MVM			Statewide Average Rates/MVM		
		F	F + I	Total	F	F + I	Total
P.M. 27.383 Southbound Off-Ramp to Mira Mesa Blvd.	15	0.000	0.50	0.675	0.005	0.61	1.50
P.M. 27.285 Northbound On-Ramp from Vista Sorrento Pkwy.	5	0.000	0.16	0.27	0.002	0.20	0.60
P.M. 27.215 Southbound On-Ramp from Westbound Mira Mesa Blvd.	30	0.000	0.13	0.65	0.001	0.24	0.70
P.M. 27.010 Northbound Off-Ramp to Vista Sorrento Pkwy.	3	0.000	0.11	0.33	0.005	0.39	1.15
P.M. 26.954 Southbound On-Ramp from Eastbound Sorrento Valley Rd.	1	0.000	0.00	0.12	0.003	0.22	0.60
P.M. 26.624 Northbound Off-Ramp to Mira Mesa Blvd.	32	0.000	0.35	0.70	0.006	0.33	0.90

General Notes:
Rates/MVM – Accidents rates per million vehicles mile, F – Fatalities, I – Injuries

TABLE 4.9 - ACCIDENT DATA for I-805 MAINLANES

Segment	Total No. of Accidents	Actual Rates/MVM			Statewide Average Rates/MVM		
		F	F + I	Total	F	F + I	Total
P.M. 25.940 – 28.499 Northbound Lanes	214	0.003	0.23	0.57	0.004	0.27	0.88
P.M. 25.940 - 28.499 Southbound Lanes	291	0.000	0.30	0.78	0.004	0.27	0.88

General Notes:
Accidents Rates/MVM – Accidents rate per million vehicles miles
F – Fatalities, I – Injuries

The main lane fatality plus injury rates were lower than the statewide average. It is anticipated that the increased number of travel lanes, the addition of auxiliary lanes, and operational improvements to the ramps, the safety of this facility would be improved.

5. ALTERNATIVES

A1. Viable Alternatives

Preferred Alternative – HOV, DAR, and Carroll Canyon Extension
The proposed CMIA project "I-805 HOV / Carroll Canyon extension Project" (**Attachment F**) includes extension of Carroll Canyon Road from Scranton Road east of I-805 to the intersection of Carroll Canyon Road with Sorrento Valley Road west of I-805. The proposed project would also provide a business access road from the proposed Carroll Canyon Road to the businesses south of Sorrento Valley Road.

The Carroll Canyon Road extension will be a four lane urban collector 25 m wide and approximately 0.83 km long. Approximately 0.5 km of this new roadway will be on structure with the remaining 0.33 km on fill. An approximately 100 m long new access road for the local businesses will be created from the Carroll Canyon Road extension to remove the non-standard distance to the intersection at Sorrento Valley Road and I-805. This new access road will include a signalized intersection and start 9 m above grade on structure and cross under Carroll Canyon at grade. An additional pedestrian staircase will be constructed to allow access to Sorrento Valley Road from the local businesses. The non-standard intersection at Sorrento Valley Road and I-805 will be replaced by revising the horizontal and vertical geometrics of Sorrento Valley Road/Mira Mesa Boulevard to accommodate a standard signalized intersection at Carroll Canyon and Sorrento Valley Road. A new signalized intersection will also be created at Scranton Road and Carroll Canyon Road.

The proposed project also includes north facing DARs from Carroll Canyon Road extension to the median of I-805, as well as, the construction of the NB and SB HOV lanes from Mira Mesa Boulevard to the existing HOV lanes at I-5 including median bridge widening at Sorrento Valley Blvd UC (Bridge No.57-786 L/R) and Mira Mesa Blvd UC (Bridge No. 57-785 L/R). The north

facing DAR is a two lane facility, which will be connected to HOV lanes. The proposed project also includes modification to the existing Carroll Canyon Overhead (OH) (Bridge No. 57-787 L/R) to accommodate the DARs, widening of the southbound lanes at the Mira Mesa Blvd UC (Bridge No. 57-785 L) to accommodate realignment of the southbound Mira Mesa loop on-ramp and realignment of the diamond on-ramp. Modifications also include southbound shoulder widening south of the existing Carroll Canyon OH (Bridge No. 57-787 L), northbound shoulder widening north of the Mira Mesa Blvd UC (Bridge No. 57-785 R) and north of the Sorrento Valley Blvd UC (Bridge No.57-786 R). Minor widening/realignment will also occur along Sorrento Valley Road / Mira Mesa Blvd, the southbound off-ramp, and Scranton Road. Extension of the NB and SB HOV lanes includes pavement widening in the median area of I-805 and Sorrento Valley Blvd UC (Bridge No. 57-786 L/R).

Nonstandard Mandatory Design Features:
A preliminary design of the build alternative was completed to identify design restrictions and potential design exceptions for this project. The I-805/Carroll Canyon Road Interchange has many physical constraints. It is located in an urban area surrounded by existing transportation facilities. In addition, this project falls under City of San Diego jurisdiction with different design guidelines compared to those of the Department. To minimize physical impacts to the existing environment and meet the Department and City of San Diego design guidelines, mandatory and advisory design exceptions are being requested.

Detailed explanations for requesting these nonstandard features are further described in the Fact Sheet Exceptions to Mandatory Design Standards and Fact Sheet Exceptions to Advisory Design Standards. These Fact Sheets have been submitted for review and approval, under separate cover.

Exceptions to Mandatory Design Standards
Listed below are the nonstandard features being requested for this project, as well as the corresponding mandatory design standards:

The project proposes the following non-standard stopping sight distances.

Table 5.1 Stopping Sight Distances

Exhibits	Design Exception No.	Curve VPI Station	Alignment	Proposed Stopping Sight Distance	Required Stopping Sight Distance
PS-01	1.1	14+42.000 (sag)	BR	49.2 m	50 m
PS-01	1.2	15+95.000 (crest)	BR	48.3 m	50 m
PS-06	1.3	442+52.288 (sag)	CCRDAR	49.3 m	50 m
PS-07	1.4	444+05.000 (crest)	DAR1	84.6 m	130 m
PS-10	1.5	444+07.000 (crest)	DAR4	85.5 m	130 m
PS-17	1.6	441+54.296 (sag)	SVRM	103.1 m	105 m
PS-11	1.7	443+80.383 (crest)	MMB4M	104.0 m	130 m
PS-14	1.8	449+01.185 (sag)	MMB5U	33.6 m	54.5 m
PS-15	1.9	447+37.963 (sag)	MMB6M	37.5 m	50 m

Highway Design Manual, Index 201.1 and Table 201.1 – Standards for Sight Distance. **"Table 201.1 shows the standards for stopping sight distance related to design speed, and these shall be the minimum values used in design."** As well as Index 201.5 and table 201.5 – Stopping Sight Distance on Vertical Sag Curves.

The project proposes the following nonstandard super elevation rates.

Table 5.2 Super elevation Rates

Exhibits	Design Exception No.	Horizontal Curve Location (BC)	Alignment	Radius (m)	Proposed Super elevation Rate	Required Super elevation Rate
PS-01	2.1	14+45.318	BR	58	.04	.12
PS-02	2.2	436+64.191	CCR	175	.03 (adverse)	.06
PS-02	2.3	440+41.985	CCR	218	.02	.05
PS-04	2.4	443+84.604	CCR	260	.02	.05
PS-04	2.5	446+10.142	CCR	1100	.036 (adverse)	.02
PS-17	2.6	440+98.777	SVRM	540	.02	.03
PS-16	2.7	443+06.337	MMBM	300	.02	.05
PS-11	2.8	443+36.224	MMB4M	300	.04	.10
PS-13	2.9	445+95.427	MMB5U	537	.04	.07
PS-13,14	2.10	447+39.172	MMB5U	55	.08	.12
PS-15	2.11	448+21.282	MMB6M	183	.11	.12

Highway Design Manual, Index 202.2 and Table 202.2 Standards for Super elevation – **"Based on the E_{max} selected by the designer for one of the conditions, super elevation rates from Table 202.2 shall be used within the given range of curve radii. If less than standard super elevation rates are approved (see Index 82.1), Figure 202.2 shall be used to determine super elevation based on the curve radius and maximum comfortable speed."**

The project proposes the following nonstandard super elevation rates on a city street or county road.

Table 5.3 Super elevation Rates on City Streets and County Roads

Exhibits	Design Exception No.	Horizontal Curve Location (BC)	Alignment	Radius (m)	Proposed Super elevation Rate	Required Super elevation Rate
PS-01	3.1	14+45.318	BR	58	.04	.0573
PS-03	3.2	440+41.985	CCR	218	.02	.0516
PS-17	3.3	440+98.777	SVRM	540	.02	.0398
PS-16	3.4	443+06.337	MMBM	300	.02	.0531

Highway Design Manual, Index 202.7 – Super elevation on City Streets and County Roads. **"Super elevation rates of local streets and roads which are within the State right of way (with or without connection to State facilities) shall conform to AASHTO standards, for the functional classification of the facility in question."**

The project proposes a stopping sight distance of 165 m at station 444+00.000 along I-805. The required stopping sight distance for the freeway is 220 m based on a design speed of 110 km/h.

Highway Design Manual, Index 203.1 – Horizontal Alignment General Controls and Table 201.1 – Sight Distance Standards. **"Horizontal alignment shall provide at least the minimum stopping sight distance for the chosen design speed at all points on the highway, as given in Table 201.1 and explained in Index 201.3."**

The project proposes the following nonstandard horizontal radii.

Table 5.4 Horizontal Curve Radii

Exhibits	Design Exception No.	Horizontal Curve Location (BC)	Alignment	Proposed Radius	Required Radius
L-02	5.1	14+45.318	BR	58.3 m	70 m
L-08	5.2	447+39.172	MMB5U	55 m	115 m

Highway Design Manual, Index 203.2 – Standards for Curvature, Table 203.2 – Standards for Curve Radius, and Figure 201.6 – Stopping Sight Distance on Horizontal Curves. **"Table 203.2 shall be the minimum radius of curve for specific design speeds. If the minimum radius indicated in Table 203.2 does not provide the desired lateral clearance to an obstruction, Figure 201.6 shall govern."**

The project proposes a grade of 8.5percent at station 14+72.000 along the "BR" alignment. The maximum grade allowed at this location is 8percent.

Highway Design Manual, Index 204.1 – Grade General Controls. **"For local facilities which are within the State right of way and where there is no connection or the connection is to a non-controlled access facility (conventional highway), AASHTO standards shall prevail."**

The project proposes the following nonstandard lane widths.

Table 5.5 Lane Widths

Exhibits	Design Exception No.	Direction	Location	Alignment	Proposed Lane Widths	Required Lane Widths
L-04	7.1	Westbound	West of Scranton Road	CCR	3.5 m	3.6 m
L-04	7.2	Eastbound	Left turn lanes at Scranton Road	CCR	3.3 m	3.6 m
L-04	7.3	Westbound	Right turn lane at Scranton Road	CCR	3.3 m	3.6 m
L-04,05	7.4	Westbound	East of Scranton Road	CCR	3.3 m	3.6 m
L-05	7.5	Eastbound	East of Scranton Road	CCR	3.3 m	3.6 m
L-03,06,07,08	7.6	Northbound	Lanes 1 - 3	A	3.3 m	3.6 m
L-03,06,07,08	7.7	Southbound	Lanes 1 - 3	A	3.3 m	3.6 m
L-01	7.8	Westbound	Through lanes West of Carroll Canyon Road	SVRM	3.3 m	3.6 m
L-01	7.9	Westbound	Left turn lane west of Carroll Canyon Road	SVRM	3.3 m	3.6 m
L-07	7.10	Westbound	Under I-805	MMBM	3.3 m	3.6 m
L-07	7.11	Eastbound	East of I-805	MMBM	3.3 m	3.6 m
L-07	7.12	Westbound	East of I-805	MMBM	3.3 m	3.6 m
L-08	7.13	Southbound	Existing Ramp	MMB6M	3.3 m	3.6 m

Highway Design Manual, Index 301.1 – Traveled Way Width. **"The basic lane width for new construction on two-lane and multilane highways, ramps, collector roads, and other appurtenant roadways shall be 3.6 m."**

The project proposes the following nonstandard cross slopes.

Table 5.6 Cross Slopes

Exhibits	Design Exception No.	Location	Alignment	Proposed Cross Slopes	Required Cross Slopes
PS-07,08,09	8.1	Entire length of alignment	DAR1	.04	.015 - .03
PS-10	8.2	Entire length of alignment	DAR4	.04	.015 - .03
PS-18	8.3	Project limits – 448+20.000	A	.04	.015 - .03
PS-12	8.4	443+02.236 – 445+60.000	MMB4M	.04	.015 - .03
PS-13	8.5	Entire length of alignment	MMB5U	.04 - .08	.015 - .03
PS-15	8.6	Entire length of alignment	MMB6M	.04 - .11	.015 - .03

Highway Design Manual, Index 301.2 (2)(b) – Cross Slopes. **"For resurfacing or widening when necessary to match existing cross slopes, the minimum shall be 1.5percent and the maximum shall be 3percent."**

The project proposes the following nonstandard shoulder widths.

Table 5.7 Shoulder Widths

Exhibits	Design Exception No.	Location	Alignment	Proposed Shoulder Widths	Required Shoulder Widths
L-03	9.1	Northbound inside shoulder	CCRDAR	0.265 m	0.6 m
L-03	9.2	Northbound outside shoulder	CCRDAR	1.5 m	3.0 m
L-03	9.3	Southbound outside shoulder	CCRDAR	2.4 m	3.0 m
L-03	9.4	Inside shoulder near start of alignment	DAR1	1.62 m	3.0 m
L-03,07	9.5	Outside shoulder	MMB4M	1 m	2.4 m

Highway Design Manual, Index 302.1 and Table 302.1 – Standards for Paved Shoulder Width. **"The shoulder widths given in Table 302.1 shall be the minimum continuous usable width of paved shoulder."**

The project proposes that the right-turn lane from westbound Carroll Canyon Road onto northbound Scranton Road be only 3.3 meters wide. The required width at this location is 3.6 meters based on the highway design manual.

Highway Design Manual, Index 405.3(2) – Design Elements. **"The basic lane width for right turn lanes shall be 3.6 m. Shoulder width shall be a minimum of 1.2 m."**

Table 5.8 Cross Slope

Exhibits	Design Exception No.	Alignment	Location	Proposed Cross Slope	Required Cross Slope
L-04	11.1	CCR	Crosswalk on the north side of the intersection of Scranton Road with Carroll Canyon Road	3%	< 2%
PS-16,L-02	11.2	MMBM	Crosswalk on the west side of the intersection of Mira Mesa Boulevard with Carroll Canyon Road	5.765%	<2%

Design Information Bulletin 82-03, 4.3.5 – Cross Slope. No more than a 1:50 (2 percent) cross slope shall be constructed on a walkway that is an accessible route.

Exception to Advisory Design Standards

Listed below are the nonstandard features being requested for this project, as well as the corresponding advisory design standard:

The project proposes the following nonstandard super elevation transition runoff lengths.

Table 5.9 Super elevation Runoff Length

Exhibits	Design Exception No.	Horizontal Curve Location	Alignment	Proposed Super elevation Runoff Length	Required Super elevation Runoff Length
PS-01	1.1	BC 14+45.318	BR	21.652 m	45 m
PS-02	1.2	BC 436+64.191	CCR	0 m	78 m
PS-02	1.3	EC 438+15.203	CCR	21.122 m	78 m
PS-02	1.4	BC 440+41.985	CCR	14.081 m	45 m
PS-03	1.5	EC 442+77.385	CCR	22.5 m	45 m
PS-03	1.6	BC 443+84.604	CCR	22.5 m	45 m
PS-04	1.7	BC 446+10.142	CCR	0 m	60 m
PS-05	1.8	EC 447+39.858	CCR	0 m	45 m
PS-06	1.9	BC 442+11.499	CCRDAR	0 m	45 m
PS-06	1.10	EC 443+20.000	CCRDAR	18.667 m	45 m
PS-07	1.11	BC 443+00.000	DAR1	0 m	45 m
PS-08	1.12	EC 448+40.673	DAR1	0 m	45 m
PS-10	1.13	BC 443+00.000	DAR4	0 m	45 m
PS-10	1.14	EC 446+58.185	DAR4	0 m	45 m
PS-17	1.17	BC 441+27.772	SVRM	0 m	87 m
PS-11	1.18	BC 442+42.000	MMB4M	0 m	45 m
PS-12	1.19	EC 446+15.961	MMB4M	28.3 m	75 m
PS-13	1.20	BC 445+95.427	MMB5U	0 m	xx m
PS-14	1.21	EC 448+70.935	MMB5U	40 m	72 m
PS-15	1.22	BC 448+21.282	MMB6M	81.239 m	84 m
PS-15	1.23	EC 449+60.195	MMB6M	0 m	45 m

Highway Design Manual, Index 202.5(1) and Figure 202.5A – Super elevation Transition. A super elevation transition should be designed in accordance with the diagram and tabular data shown in Figure 202.5A to satisfy the requirements of safety, comfort and pleasing appearance.

The project proposes the following nonstandard super elevation runoff locations.

Table 5.10 Super elevation Runoff Location

Exhibits	Design Exception No.	Horizontal Curve Location	Alignment
PS-01	2.1	BC 14+45.318	BR
PS-01	2.2	EC 16+03.982	BR
PS-02	2.3	BC 436+64.191	CCR
PS-02	2.4	EC 438+15.203	CCR
PS-02	2.5	BC 440+41.985	CCR
PS-03	2.6	BC 443+84.604	CCR

Exhibits	Design Exception No.	Horizontal Curve Location	Alignment
PS-04	2.7	EC 445+17.674	CCR
PS-04	2.8	BC 446+10.142	CCR
PS-05	2.9	EC 447+35.030	CCR
PS-06	2.10	BC 442+11.499	CCRDAR
PS-06	2.11	EC 443+20.000	CCRDAR
PS-07	2.12	BC 443+00.000	DAR1
PS-08	2.13	EC 448+40.673	DAR1
PS-10	2.14	BC 443+00.000	DAR4
PS-10	2.15	EC 446+58.185	DAR4
PS-17	2.16	BC 440+98.777	SVRM
PS-16	2.17	EC 445+87.463	MMBM
PS-11	2.18	BC 442+42.000	MMB4M
PS-12	2.19	EC 446+15.961	MMB4M
PS-13	2.20	EC 446+53.820	MMB5U
PS-13	2.21	BC 447+39.172	MMB5U
PS-14	2.22	EC 448+70.935	MMB5U
PS-18	2.23	EC 448+46.743	A
PS-19	2.24	BC 450+17.266	A
PS-15	2.25	BC 448+21.282	MMB6M
PS-15	2.26	EC 449+60.195	MMB6M

Highway Design Manual, Index 202.5(2) – Super elevation Transition, *Runoff.* Two-thirds of the super elevation runoff should be on the tangent and one-third within the curve.

The project proposes nonstandard super elevation transitions for compound curves in the following locations:

Table 5.11 Compound Curve Super elevation Transition

Exhibits	Design Exception No.	Curve PCC Station	Alignment
PS-10	3.1	445+06.544	DAR4
PS-17	3.2	440+98.772	MMBM
PS-16	3.3	444+40.000	MMBM
PS-16	3.4	443+06.337	MMBM
PS-11	3.4	443+36.224	MMB4M
PS-13	3.5	445+95.427	MMB5U

Highway Design Manual, Index 202.6 and Figure 202.6 – Super elevation of Compound Curves. Super elevation of compound curves should follow the procedure as shown in Figure 202.6. Where feasible, the criteria in Index 202.5 should apply.

The project proposes the following nonstandard super elevation rates on city streets or county roads.

Table 5.12 Super elevation on City Streets and County Roads

Exhibits	Design Exception No.	Horizontal Curve Location (BC)	Alignment	Radius (m)	Proposed Super elevation Rate	Required Super elevation Rate
PS-02	4.1	436+64.191	CCR	175	.03 (Adverse)	.06
PS-04	4.2	443+84.604	CCR	260	.02	.05
PS-04	4.3	446+10.142	CCR	1100	.036 (Adverse)	.02

Highway Design Manual, Index 202.7 – Super elevation on City Streets and County Roads. If the local agency having jurisdiction over the local facility in question maintains standards that exceed AASHTO standards, then the local agency standards should prevail.

The project proposes that the radius of the horizontal curve at station 14+45.318 along the "BR" alignment be 58.3 m. The required radius at this location is 85 m based on the *Highway Design Manual*.

Highway Design Manual, Index 203.1 – Horizontal Alignment General Controls. If the local agency having jurisdiction over the local facility in question maintains standards that exceed AASHTO standards, then the local agency standards should prevail.

The project proposes the following compound curve radii.

Table 5.13 Compound Curve Radius

Exhibits	Design Exception No.	Curve PCC Station	Alignment	Proposed Ratio of Shorter Radius to Longer Radius	Required Minimum Ratio of Shorter Radius to Longer Radius
L-02	6.1	443+06.337	MMBM	0.556	0.667
L-03,07	6.2	443+36.224	MMB4M	0.336	0.667

Highway Design Manual, Index 203.5 – Compound Curves. The shorter radius should be at least two-thirds the longer radius when the shorter radius is 300 m or less. On one-way roads, the larger radius should follow the smaller radius.

The project proposes a grade of 8.5 percent along the "BR" alignment between stations 14+72.000 and 15+80.000. The required grade at this location is 8percent based on the *Highway Design Manual.*

Highway Design Manual, Index 204.1 – Grade General Controls. If the local agency having jurisdiction over the local facility in question maintains standards that exceed AASHTO standards, then the local agency standards should prevail.

The project proposes an 8.95 percent grade along the "MMB4M" alignment between stations 444+32.383 and 444+99.601. The required grade at this location is 8 percent based on the *Highway Design Manual*.

Highway Design Manual, Index 204.3 – Standards for Grade. Minimum grades should be 0.5 percent in snow country and 0.3 percent at other locations. Ramp grade should not exceed 8 percent.

The project proposes the following nonstandard vertical curves.

Table 5.14 Vertical Curve Lengths

Exhibits	Design Exception No.	Curve VPI Station	Alignment	Proposed Vertical Curve Length	Required Vertical Curve Length
PS-01	9.1	15+95.000 (crest)	BR	30 m	60 m
PS-04	9.2	445+40.000 (sag)	CCR	30 m	60 m
PS-11	9.4	443+80.383 (crest)	MMB4M	104 m	160 m
PS-12	9.5	445+37.851 (sag)	MMB4M	75 m	150 m
PS-13	9.6	447+15.430 (crest)	MMB5U	120 m	130 m

Highway Design Manual, Index 204.4 – Vertical Curves. For algebraic grade differences of 2 percent and greater, and design speeds equal to or greater than 60 km/h, the minimum length of vertical curve in meters should be equal to 2V, where V = design speed. For algebraic grade differences of less than 2 percent, or design speeds less than 60 km/h, the vertical curve length should be a minimum of 60 m.

The project proposes a non-decked median along the I-805 overcrossing of Carroll Canyon Road. The existing median is less than 10.8 m wide and hence, the *Highway Design Manual* requires that the overcrossing be decked.

> *Highway Design Manual,* Index 208.3 – Median. On multilane divided highways a bridge median that is 10.8 m wide or less should be decked.

The project proposes the following nonstandard intersection angles.

Table 5.15 Angles of Intersection

Exhibits	Design Exception No.	Intersection	Alignment	Proposed Angle of Intersection	Required Minimum Angle of Intersection
L-02	11.1	Mira Mesa Boulevard & Carroll Canyon Road	CCR/MMBM / MMB6M/SVRM	< 75°	75°
L-02	11.2	Mira Mesa Boulevard & MMB5U	MMB5U/MMBM	< 75°	75°

> *Highway Design Manual,* Index 403.3 – Angle of Intersection. When a right angle cannot be provided due to physical constraints, the interior angle should be designed as close to 90 degrees as is practical, but should not be less than 75 degrees. Mitigation should be considered for the affected intersection design features.

The project proposes the following single lane freeway entrance details.

Table 5.16 Single Lane Freeway Entrance Details

Exhibits	Design Exception No.	Alignment	Proposed Freeway Entrance Details
L-03	12.1	MMB4M	2 m point location
L-03	12.2	MMB4M	Required 1000 m horizontal curve
L-07	12.3	MMB4M	7 m point location
L-07,08	12.4	MMB5U	Gore and tapers
L-08	12.5	MMB1	Gore
L-07	12.6	MMB2	Gore

> *Highway Design Manual,* Index 504.2(2) – Standard Designs and Figure 504.2A – Single Lane Freeway Entrance. Design of freeway entrances and exits should conform to the standard designs illustrated in Figure 504.2A-B (single lane), and Figure 504.3L (two-lane entrances and exits) and/or Figure 504.4 (diverging branch connections), as appropriate.

The project proposes a lane taper rate of 27:1 between station 442+42.000 and 444+58.000 of the "MMB4M" alignment. Based on the *Highway Design Manual*, the required taper rate is 30:1 at this location.

> *Highway Design Manual,* Index 504.3(2)(d) – Ramp Metering. The lane should be dropped using a taper of no less than 30 to 1.

The project proposes the following lane drop lengths.

Table 5.17 Lane Drop Lengths

Exhibits	Design Exception No.	Location	Alignment	Proposed Lane Drop Length	Required Lane Drop Length
L-03, L-07	14.1	Limit line	MMB4M	216 m	384 m
L-07	14.2	Limit line	MMB5U	256.2 m	458.3 m

> *Highway Design Manual,* Index 504.3(5) – Single-lane Ramps. When additional lanes are provided near all entrance ramp intersection, the lane drop should be accomplished over a distance equal to (2/3)WV. The lane to be dropped should be on the right so that traffic merges left.

Ramp Metering
This project includes ramp metering at the two southbound on-ramp locations.

Park and Ride Facilities
This project does not propose or impact any Park and Ride facilities.

California Highway Patrol (CHP) Enforcement Areas
No CHP pads are provided on this project

Highway Planting
There is no vegetation along the median of I-805 within the project limits.

Areas along ramps that are disturbed during construction will be revegetated with a seed mix that satisfies both National Pollutant Discharge Elimination System (NPDES) and biological impact avoidance guidelines.

Proposed Bridges Widening
The existing gap between the two structures (Bridge No. 57-785L and 57-786L, and Bridge No. 57-785R and 57-786R) will be closed in order to extend the proposed HOV lanes. To close this gap, the Bridge Type Selection Report recommends constructing Simple Span CIP/PS Box Girders, with span lengths of 52.87 m, 41.99 m, width 4.03 m, 6.8 m and depth of 2.134 m, 1.67 m respectfully.

Geotechnical Aspects
The Department's Office of Geotechnical Design-South II prepared a Preliminary Foundation Report (PFR), dated September 27, 2007.

According to the PFR, the project site is underlain by open-end diaphragm abutments on spared footings for Mira Mesa Bridge and open-end diaphragm abutments on 10BP57 steel piles for Sorrento Valley Bridge. At Mira Mesa Bridge the original ground consists of dense to very dense, silty gravelly sand to silty sand with cobbles overlying ironed stained siltstone, and at Sorrento Valley 13.7 m of very loose to compact silty sand and sand overlying dense sandy gravel.

The PFR indicates that the groundwater level will vary during the season and is dependent on precipitation rates; level of adjacent creek; as well as regional pumping. Further evaluation of groundwater conditions will be conducted after a Final Foundation Report is requested.

According to the Bridge Type Selection Report, the Newport-Inglewood-Rose Canyon East Fault is 4.8 – 3.7 km west of the project site. This fault is capable of producing a 7.0 magnitude earthquake.

According to the PFR, liquefaction potential is expected to be low due to the material present, but will be determined when a Final Foundation Report is requested.

Horizontal and Vertical Clearances
According to the BTSR, the proposed project site has adequate horizontal and vertical clearances for accommodating the widened structure. The BTSR indicates that the point of minimum vertical clearance remains unchanged, located on the southwest quadrant, where the edge of shoulder of Mira Mesa Boulevard and Sorrento Valley Boulevard eastbound lane intersects with the existing left bridge (carrying I-5 southbound traffic) soffit. According to the BTSR, the existing minimum vertical clearance is 4.590 m.

Because the proposed widening will be a CIP/PS Box Girder structure, the falsework will be required. The temporary vertical clearance during the construction of falsework will be 4.7 m, which meet the minimum requirement.

Aesthetics
A visual impact assessment was completed in December 2008. The visual impact of the proposed bridge widening to the existing structures is expected to be minimal. The simple span CIP/PS Box Girders will be only viewed by an observer standing directly below the bridge-widening segment.

The surface of the abutment front wall face will be treated (gun finish) to match the architectural pattern of the existing structure.

Noise Barriers
Noise barriers will not be constructed on this project.

Right-of-Way
Additional right of way will be required for this project. A right-of-way data sheet has been prepared for the project and is included as **Attachment B**.

A2. No-Build Alternative

The No-Build alternative would maintain the existing LOS of F for both AM and PM peak-hours. Maintaining the existing conditions would not alleviate traffic congestion on I-805 nor improve the LOS. Because this alternative does not improve present and future traffic, it would be inconsistent with the need and purpose of this project.

B. Rejected Alternatives

Ramp Operational Improvements

This improvement proposes various ramp improvements to the existing I-805/Mira Mesa Boulevard interchange to accommodate travel demand in the year 2030. The identified ramp improvements alone do not result in any appreciable travel time savings during the peak periods. Critical intersections continue to operate at or over capacity during peak periods in the year 2030. Intersection delays do not change appreciably. The identified ramp improvements slightly reduce the potential for off-ramp queue overflow in the year 2030. Such improvements, however, address freeway mainline operations as well as corridor safety and reliability.

Local Roadway Improvements Alternative

This alternative proposes improvements to selected local intersections within the project area, with the objective of achieving LOS D (or better) operations. Improvements identified in this alternative include additional lanes for turning and through movements. At several study intersections, the improvements may not be feasible due to either right of way constraints or other engineering limitations. While these improvements address local roadway deficiencies, this alternative does not directly address existing or future deficiencies at the freeway interchange.

Northbound Exit Ramp to Carroll Canyon Road

An option to provide a dedicated Northbound exit ramp to Carroll Canyon Road was considered, but ultimately rejected due to weaving problems with the Northbound entrance ramp from La Jolla Village Drive/Miramar Road.

6. CONSIDERATIONS REQUIRING DISCUSSION

A. Hazardous Waste

Soil containing aerially deposited lead within the median of I-805 is not hazardous to a depth of 1m. There are no restrictions regarding the use of this soil. Soil along the shoulder is also not hazardous and may be reused without restriction. This soil has been excavated during previous projects. A lead compliance plan shall be written to address the handling of ADL.

Chemically treated wood in guardrails and signposts that are removed or replaced must be treated as hazardous waste and would require special handling and disposal.

Prior to disturbance of any painted surfaces, sampling should be performed to assess the presence of lead. Suspect surfaces, including guardrails, piping, and pavement striping should be sampled

and analyzed, and if present, appropriate abatement actions shall be implemented in accordance with applicable regulatory requirements.

Prior to commencement of excavation activities, a Site Specific Health and Safety Plan shall be prepared to protect the health of both workers and the public.

B. Value Analysis

A formal Value Analysis Study is mandated by the National Highway System (NHS) Act of 1995 for projects over $25 million that are part of the NHS, including capital outlay support. A Value Analysis Study for this project was completed on October 19, 2007. The VA team was comprised of six Department functional experts from construction, design, environmental, transit planning, and traffic operations. A representative from the City of San Diego and a consultant engineer also served on the Value Analysis team.

An independent team of experts developed a project delivery schedule and refined the preliminary estimate. The schedule was validated that without the occurrence of delays due to risk, the project could be advertised by March 2009. It also proved that the project can be constructed in two years.

The estimate was reviewed, revised, and validated with the most up to date information to cost $115 million. An independent estimate was performed on the highest cost items (Carroll Canyon and DAR structures).

The following key risk factors were identified: 1) the treatment for HOV interim termini and necessary third-party agreements and partnerships, 2) Unique structures design to modify existing bridge girders, 3) Unknown scope of environmental impacts and coastal commission permit, and 4) Utility line clearance along Carroll Canyon Road. The team provided recommendations to improve the performance of the interim HOV termini. A proposal to reduce sidewalk buffers at the Carroll Canyon Road structure was later rejected due to post study cost analysis that negated the potential savings.

C. Resource Conservation

By building HOV lanes in both NB and SB directions, north facing DAR and extending Carroll Canyon Road at this location, this proposed project will reduce congestion, improve traffic flow, and in turn, reduce energy consumption. By widening to the median and utilizing the existing alignments and structural sections, construction time will be minimized; hence energy consumption for construction will be reduced. These improvements will reduce energy consumption by providing more efficient traffic operations and improving fuel efficiency by reducing intersection delay. However, during the construction of the project it is anticipated that energy consumption would temporarily increase. There is no substantial wasteful use of energy anticipated.

During the design phase of this project, the potential for recycling existing AC pavements will be investigated. Salvageable materials will be reused to the extent practical in accordance with Department specifications.

The proposed project would seek to locate staging areas within existing disturbed areas or areas within the proposed grading limits in order to minimize impacts to undisturbed areas outside the project limits.

D. Right of Way Issues

A Right-of-Way Data Sheet is included as **Attachment B**.

- Additional right-of-way will be required for this project.
- No Relocation Impact Studies are required for this project.
- No potential for future airspace leases are anticipated.
- No Railroad facilities or right-of-way will be impacted for this project.
- Utilities will be impacted for this project.

E. Environmental Issues

The appropriate environmental documents prepared to provide environmental compliance are an Initial Study (IS) leading to a proposed Mitigated Negative Declaration (MND) under the California Environmental Quality Act (CEQA), and an Environmental Assessment (EA) leading to a Finding of No Significant Impact (FONSI) under the National Environmental Policy Act (NEPA). The Department is the lead agency for both CEQA and NEPA compliance for this project, pursuant to Section 6005 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) codified in 23 USC §327(a)(2)(A). Effective July 1, 2007, the Federal Highway Administration (FHWA) has assigned, and Caltrans has assumed, all the U.S. Department of Transportation Secretary's responsibilities under NEPA.

A proposed MND/IS/EA has been prepared in accordance with Caltrans' environmental procedures, as well as State and federal environmental regulations. The attached MND is the appropriate document for the proposal.

Human Environment

The project would be constructed within an urban environment consisting of commercial and industrial land uses.

The project would be consistent with all state regional and local plans and programs.

Consideration of factors such as changes of accessibility, transportation project type, urban/suburban/rural project location, and growth pressure lead to the conclusion that there is little or no potential to influence growth. There is also minimal potential for growth-related impacts.

Modification of existing utilities would be necessary to accommodate the project features. This involves raising utility wiring to provide required clearance above the proposed Carroll Canyon Road extension. A gas blow off stack and pipeline that connects to a larger gas line would also require relocation to accommodate the construction of Carroll Canyon Road.

No impacts to cultural resources would occur in implementing the proposed project.

Physical Environment

The proposed columns for the Carroll Canyon Extension Bridge encroach into the 100-year floodplain. The proposed columns are square shaped and are 2.4 m in length and width. The encroachment would be parallel to the direction of flow and would not change or affect the water surface elevations in all but one cross-section. The water surface elevation increase for this one cross section would be 0.3 cm. When compared to the base floodplain, there appears to be no significant increase in the area of the flood boundary or the water surface elevation. No increase in flooding would result from the implementation of the Project.

Potential impacts to scientifically significant paleontological resources typically occur in the form of destruction of buried fossil remains during earth moving activities associated with construction. The improvements proposed for the project have the potential to impact paleontologically sensitive geologic units along parts of the right-of-way.

Biological Environment

Impacts to natural communities, wetlands and other waters, plant species, animal species, threatened and endangered species, have been avoided or minimized to the maximum extent practicable. Where impacts do occur, appropriate mitigation has been incorporated in the proposed MND. Measures have also been included to fence the limits of habitat of biological value to avoid impact during construction. The mitigation proposed includes:

- Establish Environmentally Sensitive Areas (ESAs) on project plans, and in the field, to preserve biological resources adjacent to the project impact area. Maintain ESAs during construction.
- Clear or grub vegetation outside of the bird nesting season (clearing would only be done between September 1 and February 15), or a qualified biologist would conduct a pre-construction nest survey with negative results during the bird nesting season.
- Comply with the Biological Opinion provided by U.S. Fish and Wildlife Service, including all Conservation Measures and Terms and Conditions.
- Establish bypass road in construction area to avoid road pools supporting San Diego Fairy Shrimp.
- Provide mitigation for San Diego Fairy Shrimp including restoration and enhancement of degraded pool areas as determined in the Biological Opinion rendered by the U.S. Fish and Wildlife Service.
- Replace the impacted coast live oaks at a 5:1 ratio in the construction area.
- Replace impacted Palmer's sagewort plants at a 2:1 ratio.
- Remove non-native, invasive plant species from the construction area such as pampas grass, giant reed, freeway iceplant, fennel, yellow-star thistle, crystalline iceplant, artichoke thistle, tree tobacco, Mexican fan palm, and northern catalpa.
- Remove 0.54 acres of non-native invasive plants from the project area.
- Minimize required trimming of sycamore tree branches east of Interstate 805 and north of Carroll Canyon Creek.
- Encumber Coastal Sage Scrub habitat on a Caltrans or SANDAG-owned parcel at a 2:1 ratio for permanent impacts to Coastal Sage Scrub and Disturbed Coastal Sage Scrub.
- Review and approve seed mix for Coastal Sage Scrub and Disturbed Coastal Sage Scrub Restoration
- Conduct on-site restoration for temporary impacts to Coastal Sage Scrub and Disturbed Coastal Sage Scrub

- Complete five year plant maintenance and monitoring program and reporting for Coastal Sage Scrub, Disturbed Coastal Sage Scrub, and non-native invasive plants.
- Complete maintenance and monitoring program, and reporting for San Diego fairy shrimp mitigation site.
- Direct lighting away and/or shield from Carroll Canyon Creek during construction to minimize impacts to wildlife corridor.

Storm Water Pollution Prevention

On July 15, 1999 the State Water Resources Control Board, SWRCB, adopted Order 99-06 DWQ, National Pollutant Discharge Elimination System (NPDES) Permit for Storm Water Discharges from the Caltrans properties, facilities and activities. This project is being designed in conformance with the NPDES Permit requirements. The SWDR analyzes cumulative potential water quality impacts of the combined projects and mitigation measures. The Project Planning and Design Guide (PPDG) Manual was used to determine the appropriate Best Management Practices (BMPs) as follows:

Treatment BMPs

Treatment BMPs must be considered and implemented for the proposed project, as required under the SWMP to prevent or minimize the long-term potential impacts of the project. A preliminary review of the project area has been completed and potential locations and types of treatment BMPs have been assessed based on the following two criteria: pollutants of concern in the receiving water bodies and feasibility (based on such factors as climate, water volume, soil conditions, physical limitations, other environmental considerations, etc.). The project would incorporate four bioswales. The bioswales would treat approximately 8 hectares of impervious area, which is equivalent to 140 percent of the total new impervious area added.

The project is also proposing to enhance three culvert outlets areas that drain to Carroll Canyon Creek to augment the treatment potential when water is conveyed through the area. The areas would be enhanced by planting or hydroseeding where erosion and scouring has occurred. The culvert outlets proposed for enhancement convey approximately 2.2 hectares of Caltrans as well as off-site runoff from adjacent properties.

Construction BMPs

The project will minimize the short-term impacts to water quality during construction by the use of construction BMPs. Funds were allocated for these BMPs based on Appendix F of the PPDG.

Design Pollution Prevention BMPs

Any vegetation outside the work limits will be preserved, which will provide erosion and sediment control benefits.

Visual Impact Assessment

A Visual Impact Assessment (conducted according to FHWA Visual Impact Assessment for Highway Projects guidelines) was finalized in December 2008 to address potential visual impacts associated with any of the proposed Improvements. Planting and irrigation would be required in all areas impacted by construction. In addition, aesthetic features, such as architectural treatments on structures would be applied at the direction of the District Landscape Architect.

Noise Impacts & Proposed Abatement

The one identified receptor is the interior sleeping quarters of the San Diego Fire-Rescue Department Station 41. It is estimated that ordinary sash windows in a light framed building

provide a noise reduction of 20 dBA. The existing windows in the station are single-pane aluminum casement windows that are acoustically comparable to ordinary sash windows. The fire station with windows closed would reach the interior noise level criterion of 52 dBA and would result in a noise impact to a sensitive receptor. The major noise sources at this receptor are from local traffic from Carroll Canyon Road and Scranton Road. There would be no practical and feasible location for constructing a sound wall at the right-of-way or within private property of the fire station. Since there is no feasible location for a sound wall, window replacement would be the most cost effective and feasible way to abate the interior noise level of the fire station. Compared to the existing single-pane windows, newly installed dual-pane windows should provide at least a 5 dB additional noise reduction. With dual-pane windows in place, the interior noise levels during the peak hour would be reduced below the NAC of 52 dBA. The City of San Diego has agreed to install dual-pane windows of the San Diego Fire-Rescue Department Station 41.

F. Geotechnical Investigation

For this project, based on research of existing documents and site reconnaissance, a Preliminary Geotechnical Report was prepared by the Caltrans Office of Geotechnical Design – South 2, in order to preview subsurface geotechnical conditions, provide analyses of anticipated site conditions, and to present preliminary geotechnical recommendations for the design and construction of the roadway portion of this project.

Along the freeway alignment, I-805 traverses mesas, small canyons, and arroyos in a series of through-cuts and fill embankments. Natural slopes along the corridor demonstrate a maximum slope inclination of about 3:1 (horizontal to vertical). Existing cut slopes are typically inclined at 2:1 (horizontal to vertical) and are up to 12.2 meter high. The cut slopes primarily expose Linda Vista Formation and are relatively stable. Existing fills vary in thickness along the project limits. Fill slope angles are typically 2:1 or flatter; however, there are a few locations where fill slope angles are steeper. Material used in the embankments was generated in cuts notched through the adjoining mesa. Embankment material, therefore, is similar in composition to the formation exposed in the cut slopes. Archived Log of Test Borings reveal that the sandy embankment fills are generally medium dense and presumably compacted to Department Standards.

The project site lies within the coastal plain section of the Peninsular Ranges Geomorphic Province of California. The coastal plain generally consists of subdued landforms including mesas underlain by Cenozoic sedimentary formations. From SR-52 north to the southern slope of Carroll Canyon, the I-805 freeway primarily traverses mesas and cuts in the Linda Vista Formation. Within this interval, Scripps Formation and Stadium Conglomerate underlie lower areas of the native topography. Within Rose Canyon, Carroll Canyon, and Los Penasquitos Canyon, some freeway facilities are underlain by alluvial soils. From Carroll Canyon north to the I-5 junction, Bay Point Formation and Ardath Shale mostly underlie the freeway. Localized locations of colluvium and alluvium occur as subgrade to the freeway embankment.

With the exception of the Ardath Shale Formation and alluvium, all native geologic units that underlie the alignment of this project are highly competent. Only a relatively minor section of the project alignment may be impacted by the presence of Ardath Shale Formation. The project area is underlain by a near horizontal succession of sedimentary strata. These formations include Ardath Shale, Stadium Conglomerate, Scripps Formation of the La Jolla Group, and

Pleistocene aged Linda Vista and Bay Point Formations. More recent deposits consist of Holocene aged alluvium, colluvium, and artificially compacted fill.

The Ardath Shale is comprised predominantly of weakly fissile, olive-gray shale with concretion beds. Bedding of the unit dips generally east to southeast at a shallow angle of 3 to 5 degrees. Expansive claystone locally comprises 25 percent of the Ardath Shale and landslides are commonly associated with those areas where this formation crops out on hillsides. In addition, studies by Caltrans found that the fill materials that originated from the Ardath Shale Formation were susceptible to significant settlement. This is likely because upon wetting coarse fragments of claystone decompose into a denser soil structure thus inducing settlement.

The Scripps Formation typically consists of pale yellowish-brown, medium grained sandstone, often silty or clayey, and occasional cobble-conglomerate interbeds. The Stadium Conglomerate is comprised of gravelly clays and sands with cobbles. Occasional boulders are present. Boulders as large as 500 millimeter in diameter are occasionally encountered. Fine grained material within this formation generally constitute less than 20 percent of the unit, but locally sandstone beds and lenses may comprise as much as 50 percent of the unit. The Linda Vista Formation is comprised of reddish-brown sandstone and conglomerate and is typically less gravelly and cobbly than the Stadium Conglomerate. Ferruginous cement, mainly hematite, gives the Lindavista Formation its characteristic color and resistant, ledgy nature.

The Bay Point Formation is composed mostly of marine and nonmarine, poorly consolidated, fine and medium grained, pale brown sand and/or sandstone. The marine part of the formation is fossiliferous and consolidated. It interfingers with unfossiliferous sandstone that lies generally above it, more than 30.5 meter but less than 61 meter above sea level. This part of the Bay Point Formation is considered a nonmarine slope wash. Alluvium consists primarily of poorly consolidated stream deposits of silt (often clayey), sand, and cobble-sized particles derived from bedrock sources that lie within or near the area. These materials were derived as slope wash or were transported and deposited by the Penasquitos Creek and the Carroll Canyon and Carmel Valley tributaries. Alluvial soils are generally considered moderately to highly compressible, and where granular, potentially subject to liquefaction during a major seismic event.

Artificial fill consists of compacted earth materials derived from nearby sources.
The natural slopes along the project alignment appear to be stable. However, in the vicinity of this project, on slopes exposing Ardath Shale Formation, several landslides were mapped (Kennedy and Peterson, 1975).

The closest fault to the project site is the Rose Canyon Fault Zone, which is believed to be capable of producing an earthquake with a Maximum Credible Magnitude of 7.0 on the Richter scale. It is located about 5.50 kilometers south and west from the project site. The potentially active La Nacion Fault is located about 18 kilometers southeast from the southern end of the project limits, and it is considered capable of producing an earthquake with a Maximum Credible Magnitude of 6.75 on the Richter scale. In addition, the Elsinore Fault, about 25.5 miles northeast of the project limits, is considered capable of producing an earthquake with a Maximum Credible Magnitude of 7.5 on the Richter scale. All three referenced faults are believed to be capable of generating a Peak Bedrock Acceleration of about 0.5 g at the project site (Mulchin, 1996).

A review of previously developed LOTB's for the freeway bridges located within the project limits reveals that in the Rose Canyon area the potential for soil liquefaction appears to be very low. However, the potential for soil liquefaction appears to be high in the Carroll Canyon area. Further analysis of liquefaction potential will be required and special design considerations may be needed to mitigate liquefaction. The effective seismic horizontal coefficient, k_h, used in pseudo-static slope stability analysis is specified in Caltrans Guidelines for Foundation Investigation and Reports (Version 1.2) as 1/3 of the peak ground acceleration. Therefore, k_h = 0.16 should be used for the pseudo-static slope stability analyses.
Archived data indicate that on average the soil locally derived from cut areas will shrink during recompaction. It is recommended that the following grading factors be applied to the project.

Sedimentary Formation

a) Placed at 90 percent relative compaction: $G_f = 0.96$
b) Placed at 95 percent relative compaction: $G_f = 0.94$

Numerous retaining walls have been proposed for this project. Retaining walls must satisfy Caltrans requirements for internal and external (global) stability. For internal stability calculations, the minimum static sliding factor of safety is 1.5. Under seismic loading, a minimum sliding factor of safety of 1.1 is required. The factor of safety against overturning is considered acceptable if the resultant force on the base of the foundation falls within the middle 1/3 of the footing. For external (global) stability consideration, the retaining wall and adjacent embankment geometry must be viewed and analyzed as a slope stability problem and evaluated according to the criteria presented in Sections 8.2 and 8.3 of the Preliminary Geotechnical Design Report. The wall and embankment geometry must also be viewed and analyzed for potential bearing capacity failure if soft foundation soils lay beneath the embankment. The anticipated differential settlement must also be within the tolerable limits for the type of retaining system.

The following Allowable Bearing Pressures may be assumed for the purpose of preliminary wall design.

Wall Type	Sedimentary Formation	Engineered Fill
Standard CIP	8000 psf	4000 psf
MSE	8000 psf	4000 psf

For preliminary design purposes, all soils should be considered to be corrosive.

G. Air Quality Conformity

The proposed project is fully funded in the SANDAG 2007 Regional Transportation Plan (Table A.1, Page A-5; Table A.2, Page A-9). FHWA and FTA issued the air quality conformity finding on December 10, 2007. The project was also included in the conforming SANDAG 2006/2011 Regional Transportation Improvement Program (RTIP) (CAL09C), and was carried forward into the SANDAG 2008/2013 RTIP (CAL09C). FHWA/FTA approved the conformity determination of the 2008 RTIP and redetermined conformity of the 2007 RTP on November 17, 2008. Project design concept and scope are consistent with the project description in the 2007 RTP, the 2008 RTIP, and the assumptions in SANDAG's regional emissions analysis.

H. Title VI Considerations

The proposed project includes elements for accessibility, pedestrian, and other non-motorized traffic in compliance with Title VI of the Civil Rights Act of 1964 and related statutes. Caltrans ensures that no person in the State of California shall, on the grounds of race, color, national origin, sex disability, and age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity it administers.

7. OTHER CONSIDERATIONS

Public Hearing Process

It is recommended that the Final Environmental Document (Final ED) for this project be approved for public circulation and a public hearing be offered.

Route Matters

No revised freeway agreement, route adoptions, nor relinquishment is required for this project.

Permits

The following permit requirements pertain to the proposed improvements along I-805:

- Project work will be performed under the requirements of the state's General NPDES Permit and the Caltrans Statewide Permit
- The project lies within the jurisdiction of the City of San Diego's Local Coastal Program. A Coastal Development Permit would be acquired to permit construction of the project.
- The project lies within the jurisdiction of the City of San Diego. An Encroachment Permit would be acquired to permit construction of the project.
- The project will require a Section 7 Consultation for Threatened and Endangered Species.

Cooperative Agreements

A Supplemental Agreement (No. 6) to Master Agreement 11-0387 was entered into effect on January 8, 2005, between the State of California, acting through the Department, and SANDAG. This project is included in the amendment as one of the selected Early Action Projects (EAP). EAPs are not-yet-completed projects that were included in the initial San Diego Transportation Improvement Program Ordinance (TransNet I) as well as selected projects included in TransNet II.

A cooperative agreement has been entered into between the City of San Diego and the Department to provide for construction of Carroll Canyon and the new business access loop within the City of San Diego's right of way by Caltrans and to relinquish control of Carroll Canyon and the new business access loop after construction. Additionally, the new business access loop is partially located within state's right of way. This right of way will also be relinquished to the City of San Diego after construction is complete.

An Amendment to the existing Maintenance Agreement between the City and the Department for the area covering Mira Mesa Boulevard and La Jolla Village Drive will be processed to outline the maintenance responsibilities of Carroll Canyon within the State's right of way. In addition to maintaining Carroll Canyon Road with in the City's limits, the City will also maintain Carroll Canyon Road within the States' right of way, but Caltrans will retain control of the traffic signal

at the intersection of Carroll Canyon road and the DAR. The Department intends to plant self sustaining vegetation within the project area after completion of the project. Any vegetation within the City of San Diego right of way will be maintained by the City of San Diego after the completion of the initial establishment period of one year and the additional maintenance period of 3 years, during which time the Department will maintain the vegetation.

Other Agreements

Any other needed agreements will be prepared and executed as required by the project.

Transportation Management Plan

Temporary concrete barriers Type K would be placed on the existing median area (in both directions of travel) to protect the construction working zone from the freeway traffic. However, the existing number of lanes would be maintained, as traffic would be shifted toward the right (outside) shoulder of the freeway in both directions of travel. Any required lane closures would have to be reviewed by the District's Traffic Manager and specified in the combined PS&E package. These lane closures would be determined during the preparation of the combined PS&E package.

As far as the Mira Mesa Boulevard UC and Sorrento Valley Boulevard UC widening is concerned, girder erection may require lane closures on the freeway. Girders could be erected and placed at night to reduce the impacts to the freeway traffic. Since falsework would not be required for the bridge widening construction, it is expected that traffic impacts at Mira Mesa and Sorrento Valley would be minimal. However, temporary lane closures may be required for erecting and placing the precast girders.

The sidewalk on Mira Mesa Boulevard and Sorrento Valley Boulevard would be impacted during the bridge construction. A temporary pedestrian opening should be provided at the westbound shoulder area to allow for pedestrian passage through the bridge construction area. Proper signage should be placed at adjacent intersections to warn pedestrians about the temporary pedestrian opening.

Stage Construction

Construction of the project is expected to last approximately 18 months. During that time, construction staging is necessary to maintain traffic during construction. As previously discussed, the staging of construction will be closely coordinated with the development of the TMP. Bike access on Mira Mesa Bvld. and Sorrento Valley Road in both directions will be maintained during construction.

Accommodation of Oversize Loads

Oversized loads will not need to be accommodated for this project.

Graffiti Control

The project vicinity has been identified as a graffiti-prone area. Adequate access restrictions shall be established to limit the potential for graffiti. Measures to reduce graffiti will be incorporated into the PS&E and may include:

- Anti-graffiti coating on walls
- Densely spaced vine planting sufficient to cover 90 percent of retaining walls to act as a graffiti deterrent
- Graffiti guards on bridge mounted signs

- Anti-climb measures on pole-mounted signs

8. PROGRAMMING

The current cost of the I-805 HOV/Carroll Canyon Extension Project is estimated at $87.8 million as shown in the 11-page estimate (see **Attachment D**). $97.5 million have been programmed in the HB4N (Noncapacity Increasing Operational Improvements) program to fund the project. SANDAG *TransNet* program will finance this project. Supplement 6 of an existing Master Agreement "Transportation Sales Tax Highway Projects" (Agreement No. 11-0387) between the Department, SANDAG, and the San Diego County Regional Transportation Commission enables the Department to use *TransNet* funds for the I-805 HOV/Carroll Canyon Extension Project.

The proposed schedule for the I-805 HOV/Carroll Canyon Extension Project is as follows:

Project Approval and Environmental Document (PA&ED)	March 2009
Plans, Specifications and Estimate (PS&E)	April 2009
Ready-to-List (RTL)	June 30, 2009
Begin Construction	December 2009
End Construction	March 2012

9. REVIEWS

This project has been reviewed by the FHWA and the addition of direct access ramps from Carroll Canyon Road to the managed lanes on I-805 has been found acceptable on July 23, 2008. If there are no major changes in design, final approval will be given upon completion of the environmental process. Additionally, a design exception for an additional lane on the southbound off ramp to Mira Mesa Boulevard to provide for a through movement to Carroll Canyon Road has received concurrence.

This project has been reviewed for concurrence by Luis Betancourt, Headquarters (HQ) Design Reviewer on June 22, 2007.

The proposed HOV Extension Project begins immediately north of the Mira Mesa Boulevard and terminates after I-5/805 merge to connect to existing HOV lanes. Neither waters of the U.S. nor wetlands would be impacted. It should be noted, however, that the ultimate points of discharge of the new and existing drainage systems (to be constructed in the median area) is Carroll Canyon Creek and Los Peñasquitos Creek.

Engineering Features

The proposed project includes construction of DAR and new HOV lanes in the NB and SB directions of I-805. These HOV lanes would extend the existing HOV lanes (one in each direction of travel), which begin at the junction of I-5 and I-805 and terminate at the south end of the Mira Mesa Boulevard Bridge. The width of the new pavement would be 5.1 m at most locations. Concrete barriers Types 60S with scuppers, 60SA, and 60SE would also be constructed along the median, as well as new drainage systems. The Mira Mesa Boulevard UC and Sorrento Valley Blvd UC would also be widened into the median (closing the gap between the existing Left and Right structures) as shown on The following sections explain the proposed engineering features in more detail.

Direct Access Ramp (DAR)
The DARs are 3.6 meters wide (each lane) and provide 0.6 meter wide (minimum) shoulders. The maximum ascent/descent grade of the DARs is approximately 6 percent. Access to DARs from Carroll Canyon Road would be available to HOVs and other eligible vehicles. A portion of the DARs is comprised of bridges and split/clear the existing bridge columns of the I-805 structure. The non-bridge portions of the DARs will need soil nail walls in the median in order to accommodate a grade separation from the I-805 main lanes. The walls are approximately 530 meters in length with a maximum height of 16 meters. Due to the geometrics of the DAR facing a stub-end and it being controlled by a signalized intersection, it would be enforced by a regulatory speed limit of 45 mph by installing speed limit signs at appropriate spacing. Also, the DAR will have rumble strips across the entire length of the traveled way and shoulders, speed feedback signs, and signal ahead signs with a flashing beacon at appropriate spacing. Furthermore, the stub-end would be cushioned with an array of temporary crash cushions.

NB and SB HOV Lanes
As outlined above, the extension of the HOV lanes will be accomplished by widening the freeway into the existing median of I-805 within the project limits. Two new structural sections are being proposed. For the purposes of this report, these two structural sections will be referred to as: (1) HOV lanes structural section, and (2) concrete barrier Types 60SE and 60S structural section.

HOV Lanes Structural Section
This section of the PSR/PR discusses the proposed structural section for the new HOV lanes. It would be Portland Cement Concrete Pavement (PCCP) that would be constructed in both directions of travel. It would tie into the existing traveled way pavement (also PCCP) within the project limits. In order to build this new structural section, the existing Asphalt Concrete (AC) left (inside) shoulders and metal beam guardrails would have to be removed. The existing traveled way would be cut 0.9 m from the existing inside edge of traveled way (ETW). This would be the sawcut line location. The new structural section would match the existing structural section at this location. The new structural section would be approximately 5.1 m wide. The new structural section would have a grade break point located 2.1 m from the sawcut line. The cross slope of the new structural section (along this 2.1 m width) would match the cross slope of the existing traveled way. The cross slope on the existing traveled way is approximately 1.5 percent on tangent sections and up to 4 percent on super elevated sections. The proposed cross slope from the grade point to the new edge of shoulder (ES) is 2.5 percent and variable (draining toward the centerline of I-5). Concrete barriers (Type 60S with scuppers) will be placed on this new structural section as shown on **Attachment F**.

The proposed structural section is as follows:

230 mm Portland Cement Concrete (PCC) over,
120 mm Hot Mix Asphalt (HMA) Type A over,
165 mm Aggregate Base (AB) Class 2
This structural section is based on a Traffic Index (TI) of 12.0 and a Resistance Value (R Value) of 10.

Concrete Barrier Types 60SE and 60S Structural Section
This section of the PSR/PR discusses the proposed structural section upon which concrete barriers (Type 60SE) would be placed. This structural section would be constructed along 100 m before and after the new Mira Mesa Boulevard UC median deck (100 m before and after the

beginning of bridge (BB) and end of bridge (EB), respectively). Type 60SE barriers are required to transition from two Type 60S barriers to one Type 60SA at these locations. In addition, this proposed structural section would be constructed approximately 55 m before and after the Sorrento Valley Boulevard UC median deck (55 m before and after the BB and EB, respectively). A diagonal concrete barrier (Type 60SA) would be constructed across the median deck and Type 60S across the proposed structural section (55 m before and after the BB and EB, respectively).

The proposed structural section is as follows:

90 mm Hot Mix Asphalt (HMA) over,
285 mm Aggregate Base

Widen Mira Mesa Boulevard Undercrossing (UC)
Currently, the Mira Mesa Boulevard UC consists of two separate structures (Bridge Numbers 57-489L and 57-489R, respectively). The existing gap between the two structures will be closed in order to extend the proposed HOV lanes **(Attachment E)**. To close this gap, a Bridge Type Selection Report (prepared by the Office of Bridge Design Southern California, Branch 19) recommends constructing Precast/Prestressed (PC/PS) Caltrans I – Girders, with span lengths of 9.528 m – 24.18 m – 11.357 m, respectively, for the total length of the structure to be 45.065 m. The width of the proposed widening would be 5.282 m, and the depth of the superstructure would be 1.475 m. Reference should be made to Section 8 "Structures" of this PSR/PR for a more detailed discussion of the issues associated with the widening of the Mira Mesa Boulevard UC.

Widen Sorrento Valley Boulevard Undercrossing (UC)
Currently, the Sorrento Valley Blvd UC consists of two separate structures (Bridge Numbers 57-786L and 57-786R, respectively). The existing gap between the two structures will be closed in order to extend the proposed HOV lanes **(Attachment E)**. To close this gap, a Bridge Type Selection Report (prepared by the Office of Bridge Design Southern California, Branch 19) recommends constructing Precast/Prestressed (PC/PS) Caltrans I – Girders, with span lengths of 9.528 m – 24.18 m – 11.357 m, respectively, for the total length of the structure to be 45.065 m. The width of the proposed widening would be 5.282 m, and the depth of the superstructure would be 1.475 m. Reference should be made to Section 8 "Structures" of this PSR/PR for a more detailed discussion of the issues associated with the widening of the Sorrento Valley Boulevard UC.

Construct Drainage Systems in the Median Area
New drainage systems will be constructed in the median area of I-805 within the project limits. These new drainage systems will consist of: (1) storm drain inlets types G1 and G2 (grate type inlets); (2) grated line drains; (3) 450 mm and 600 mm diameter reinforced concrete pipes (RCP) of various lengths with concrete collars (to tie new pipes into existing structures); and (4) concrete aprons. The new drainage systems will tie into existing drainage facilities. The existing drainage facilities consist of inlet types OCP (pipe type inlet), OS and O1 (curb opening type inlets); as well as RCP of various diameters such as 600, 750, and 900 mm. Some of the existing facilities will have to be removed. These include segments of existing 600 mm RCP, and existing AC aprons. Most of the new storm drain inlets will be constructed adjacent to the new concrete barriers to be placed along the median of I-805. The rest of the new inlets will be constructed between the new concrete barriers.

Grated line drains will be placed at certain locations adjacent to the concrete barriers and draining to the new inlet structures to be constructed on the inside (left) shoulders. RCP segments of 450

mm diameter will tie the new storm drain inlets located on proposed inside shoulders to the existing and new inlets located along concrete barrier. RCP with 600 mm diameter will be placed at certain locations along the centerline of I-805 and will tie into existing or new inlets.

There is a high point (crest) at approximately 530 m north of the I-5/805 interchange. The ultimate point of discharge of the storm water runoff conveyed by the new and existing drainage systems will be the Los Penasquitos River.

Removal and Replacement of Existing Metal Beam Guardrail

In order to build the new structural sections, existing Metal Beam Guardrails (MBGR) will be removed. These MBGR will be replaced with concrete barriers Type 60S with scuppers and concrete barriers Type 60SE. Dual concrete barriers (Type 60S with scuppers) will be constructed in the median area of I-805, except along the two horizontal curves located within the project limits. A single concrete barrier would be constructed along each of those two curves as shown in **Attachment F**. This would be done in order to provide adequate stopping sight distance along those two curves. A single concrete barrier (Type 60SA) will be constructed on the new Mira Mesa Boulevard UC and Sorrento Valley Boulevard UC median deck. A Type 60SE concrete barrier will be constructed (south of the median deck) to transition from two Type 60S barriers to one Type 60SA barrier along a 100 m distance measured from the BB of the Mira Mesa Boulevard UC and Sorrento Valley Boulevard UC. Similarly, a concrete barrier Type 60SE would be used (north of the median deck) to transition from a barrier Type 60SA to two barriers Type 60S with scuppers. This would be done along a 100 m distance measured from the EB of the Mira Mesa Boulevard UC and Sorrento Valley Boulevard UC.

Modify Pavement Delineation

Attachment F shows the proposed lane configurations within the project limits. The I-805 pavement would be delineated to accommodate one HOV lane and four general-purpose lanes in each direction of travel. The HOV lanes would be 3.6 m wide as well as general-purpose lanes. There would be one auxiliary lane in both the NB and SB directions of I-805 between Mira Mesa Road and La Jolla Village Drive/Miramar Road. These auxiliary lanes would be 3.6 m wide. The width of the left (inside) shoulders would range from 1.2 to 2.4 m throughout most of the project limits. The right and left (outside) shoulders would be approx. 2.4 m to 3.0 m wide between Mira Mesa Boulevard and I-5/805 Junction.

10. PROJECT PERSONNEL

Arturo Jacobo	Project Manager	(619) 688-6816
Michael Lubin	Project Manager Assistant	(619) 688-0282
Majid Kharrati	Design Manager	(619) 688-6729
Mohammad Ravanipour	Structures Design Manager	(909) 598-5421
Frank Wei	Structures Project Engineer	(909) 598-5991
Shahbaz Alvi	Project Engineer	(619) 688-0140
Timothy Vo	Transportation Engineer	(619) 688-3209
Kelly Finn	Environmental Analysis Branch Chief	(619) 688-0229
Luke Serna	Environmental Generalist	(619) 688-3139
Jayne Dowda	Environmental Engineering Chief	(619) 688-0182
Azar Habibafshar	Environmental Engineering	(619) 688-3192
Joel Kloth	Environmental Engineering	(619) 688-3146
Jacque Clayton	Environmental Engineering	(619) 688-3166
Sue Scatolini	Environmental Resource Studies (Biology)	(619) 688-0191
Gladys T. Baird	Environmental Stewardship (Permits)	(619) 688-0115
May Alsheikh	Environmental (NPDES)	(619) 688-0161
Aly Wayne	Transportation Planning	(619) 688-2503
Waldo R.Lopez	Hydraulics	(619) 688-6752
Kent Askew	Landscape Architecture	(619) 688-0121
Carol Callejon	Landscape Architecture	(619) 688-0123
Pat Kipling	Right of Way	(619) 688-6932
Anh Hoang	Traffic Design – Signing and Striping	(619) 688-3331
Hua Sawaya	Traffic Design – Electrical	(619) 688-6780

11. LIST OF ATTACHMENTS

Attachment A: Project Vicinity and Location Maps-Viable Alternative
Attachment B: Right of Way Data Sheet
Attachment C: Preliminary Utility Information
Attachment D: Build Alternative 11-Page Estimate
Attachment E: Typical Cross Sections
Attachment F: Project Layout Sheets
Attachment G: Profiles and Super Elevation Diagrams
Attachment H: Traffic Study
Attachment I: Draft Environmental Document

Attachment A

Project Vicinity and Location Maps

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
11	SD	805	KP R42.6 / R46.2 PM R26.5 / R28.7	1	XXX

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

PROJECT PLANS FOR CONSTRUCTION ON
STATE HIGHWAY

IN SAN DIEGO COUNTY
IN SAN DIEGO ON ROUTE 805 FROM 1.0 Km SOUTH OF MIRA MESA BOULEVARD/SORRENTO VALLEY ROAD TO2.6 Km NORTH OF MIRA MESA BOULEVARD

To be supplemented by Standard Plans dated July, 2004

INDEX OF SHEETS

Sheet No. Description

Typical Cross Sections
Key Map and Line Index
Layouts
Profiles and Superelevation Diagrams
Construction Details
Temporary Water Pollution Control Plans, Details and Quantities
Erosion Control Plans, Details and Quantities
Contour Grading
Drainage Plans, Profiles, Details and Quantities
Utility Plans
Construction Area Signs, Traffic Handling Plans and Details
Stage Construction and Quantities
Pavement Delineation Plans, Details and Quantities
Sign Plans, Details and Quantities
Summary of Quantities
Reinforced Concrete Crib Wall
Highway Planting Plans
Electrical Plans
Revised and New Standard Plans

STRUCTURE PLANS

THE STANDARD PLANS LIST APPLICABLE TO THIS CONTRACT IS INCLUDED IN THE NOTICE TO CONTRACTORS AND SPECIAL PROVISIONS BOOK.

LOCATION MAP

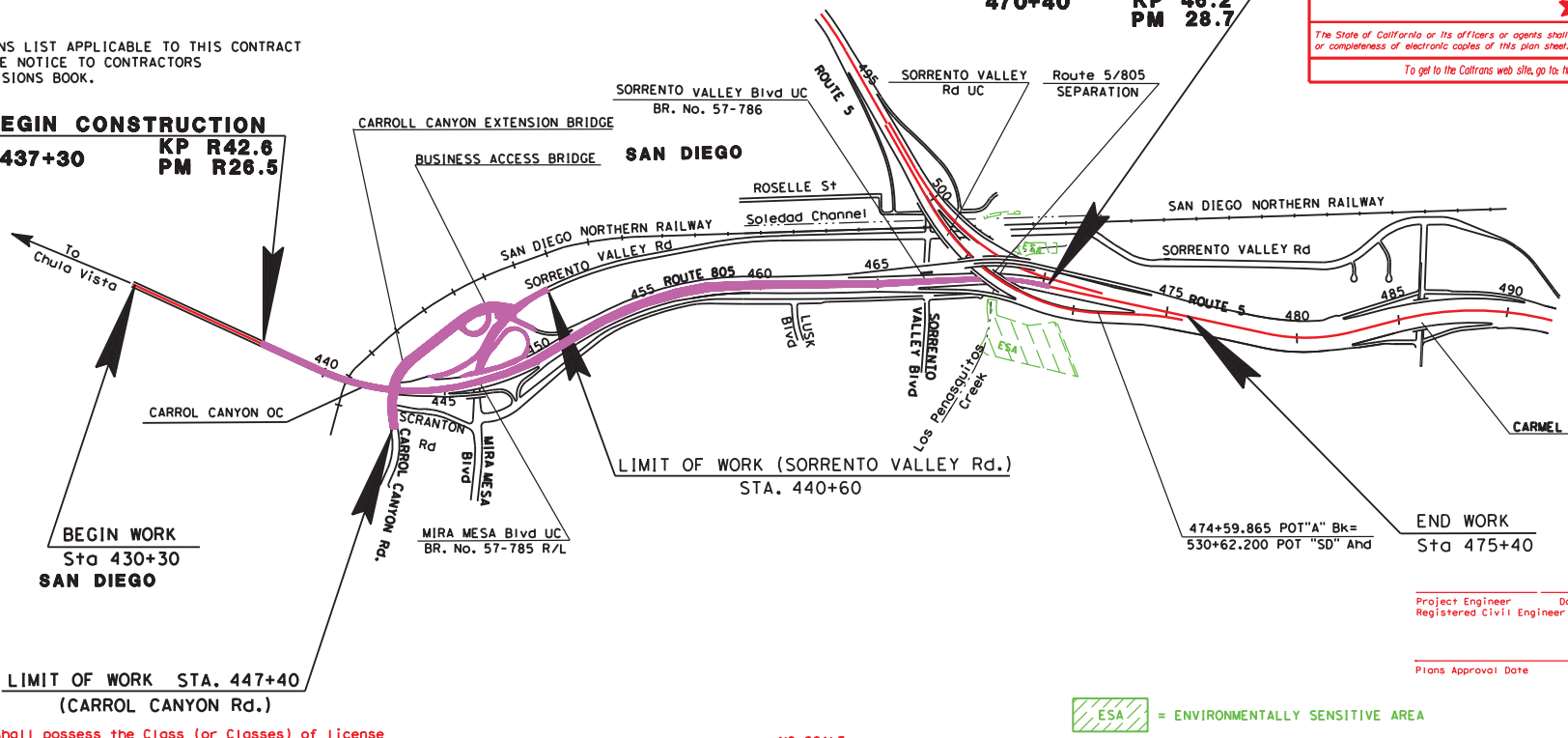
The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

To get to the Caltrans web site, go to: http://www.dot.ca.gov

Caltrans Metric

END CONSTRUCTION
470+40 KP 46.2
PM 28.7

BEGIN CONSTRUCTION
437+30 KP R42.6
PM R26.5



The Contractor shall possess the Class (or Classes) of license as specified in the ''Notice to Contractors''.

NO SCALE

ESA = ENVIRONMENTALLY SENSITIVE AREA

Project Engineer Date
Registered Civil Engineer

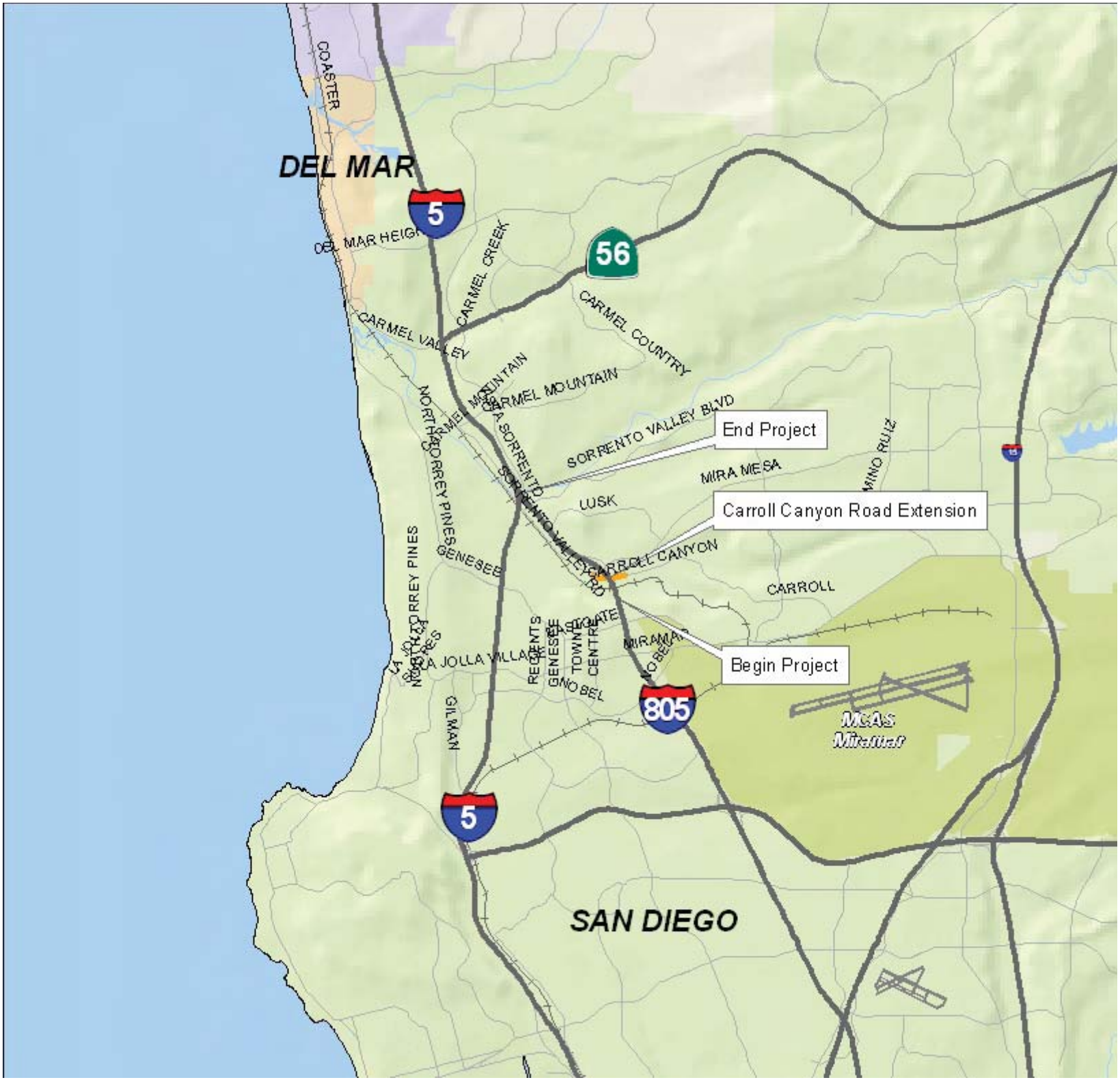
Plans Approval Date

REGISTERED PROFESSIONAL ENGINEER S.A. ALVI No. C 55293 Exp. 12-31-08 CIVIL STATE OF CALIFORNIA

PROJECT MANAGER A. G. JACOBO
PROJECT ENGINEER S. A. ALVI

LAST REVISION 10-08-08
DATE PLOTTED => $DATE
TIME PLOTTED => $TIME

Contract No. 11-2358U4


DEL MAR
SAN DIEGO
5
56
805
COASTER
DEL MAR HEIGHTS
CARMEL CREEK
CARMEL VALLEY
CARMEL COUNTRY
CARMEL MOUNTAIN
NORTH CARMEL MOUNTAIN
SORRENTO VALLEY BLVD
End Project
MIRA MESA
MIRAMAR
LUSK
Carroll Canyon Road Extension
CARROLL CANYON
CARROLL
NORTH TORREY PINES
GENESEE
Begin Project
LA JOLLA VILLAGE
REGENTS
GENESEE
TOWN & COUNTRY
CENTRE
GILMAN
MCAS
Miramar

Attachment B

Right of Way Data Sheet
Right of Way Exhibit

State of California **Business and Transportation Agency**

M E M O R A N D U M

To: Arturo Jacobo, Project Manager

Attn: Shahbaz Alvi, Design Engineer

From: DEPARTMENT OF TRANSPORTATION - District 11 Right of Way

Date: March 25, 2008
File: 11-SD-805
K.P.: R42.75
P.M.: 26.5 – 28.7
E.A.: 2T0401

Subject: Right of Way Data – Construct HOV and DAR

Programmed Amount: $ -0-

1. **R/W Cost Estimate:**

		Current Value Future Use	Annual Escalation Rate	Escalated Value June 2010
A)	Acquisition, including Excess Land, Damages & Goodwill, Fees.	$ 750,000	6%	$ 893,000
	SB-1210	$ 15,000		$ 15,000
B)	Acquisition of Offsite Mitigation	$ -0-		$ -0-
C)	Utility Relocation (State Share)	$ 2,025,000	5%	$ 2,344,000
	Potholing (Design Phase)	$		$
D)	Clearance / Demolition	$		$
E)	Relocation Assistance	$		$
F)	Title and Escrow	$ 5,000	6%	$ 6,000
	R/W Estimate	$ 2,795,000		$ 3,258,000
G)	Condemnation Settlements 0%	$		$
H)	Design Appreciation Factor 10% (Items G & H applied to items A + B)	$ 75,000		$ 89,500
	Total R/W Estimate (Excluding Item #8 - Hazardous Waste)	$ 2,870,000	**Escalated**	$ 3,347,500

Current Date of Right of Way Certification June 2010

2. **Parcel Data:**

	Type	Du.App	G/W App
X			
A			
B	3		
C	2		
D			
Total	5	Excess Parcels	

Utilities	
U4-1-	
-2-	
-3-	
-4-	
U5-7-	7
-8-	
-9-	

Railroad Involvements	
None	
C&M Agree	
Service Cont	
Lic/Re/Clauses	1
Misc R/W Work	
Rap Displacements	
Clearance/Demolitions	
Construction Permits	

Areas: R/W Fee: 3.05 acres Excess
R/W Easements:

Ent PMCS 1. EVENT RW SCREEN (All Data) 4 / 1 / 08 sek
2. AGRE SCREEN (Railroad Data Only) / /

REMARKS: This is a rough estimate based on a revised design of the former Consultant's Report. The cost will be revised when utility research is completed and design plans are finished and provided to Utility Engineering by PE or Consultant. Two parcels are owned by the City of San Diego included in the parcels identified in this Data Sheet. Railroad requires Section 13 Short Clauses & Railroad Clearance Letter. SEE THE ATTACHED COMMENTS, ASSUMPTIONS & LIMITING CONDITIONS CONTINUED ON PAGE 4 OF THIS DATA SHEET.

File: 11- SD-805
K.P.: R42.75
P.M.: 26.5 – 28.7
E.A.: 2T0401

3. Are there major items of construction contract work?
Yes ____ No _X_ Not determined at this time _____ (If yes, explain.)

4. Provide a general description of the right of way and excess lands required (zoning, use, major improvements, critical or sensitive parcels, goodwill, etc.). **One part-take of an open space portion of a developed commercial property. One full takes and one part-take of vacant open space parcels that are encumbered with utility easements. Aforementioned City of San Diego owned property.**

5. Is there an effect on assessed valuation? (If yes, explain.)
Yes ____ No _X_

6. Are utility facilities or rights of way affected?
Yes _X_ No____ Not determined at this time____ (If yes, explain.)
SDG&E-Electric; SDG&E-Gas; City of San Diego – Water; City of San Diego-Sewer; AT&T – Telephone; Cox Cable – TV and Kinder Morgan – Petroleum Line.

7. Are railroad facilities or rights of way affected?
Yes _X_ No____ (If yes, explain.)

Name(s) of railroad(s) : **MTS, NCTD, BNSF & AMTRAK**

When branch lines or spurs are affected, would acquisition and/or payment of damages to businesses and/or industries served by the railroad facilities be more cost effective than construction of a facility to perpetuate the rail service? (See Procedural Handbook Vol. 4a, Chap. 440 for detail.)
Yes ____ No_X_ (If yes, explain.)

8. Were any previously unidentified sites with hazardous wastes and/or material found?
Yes ____* None Evident _X_
(* If yes, attach memorandum per RWPH Vol. 1, Sec. 101.026).

9. Are RAP displacements required?
Yes____ No_X_ (If yes, provide the following information.)

Number of single family _____ No. of business/nonprofit _____

Number of multi-family _____ No. of farm _____

Based on _____ Relocation Impact Statement/Study dated,_____ it is anticipated that sufficient housing (will/will not) be available without Last Resort Housing.

10. Are there material borrow and/or disposal sites required?
Yes ____ No _X_ Not determined at this time _____ (If yes, explain.)

11. Are there potential relinquishments and/or abandonment's?
Yes ____ No _X_ (If yes, explain.)

12. Are there existing and/or potential Airspace sites?
Yes _X_ No ____ (If yes, explain.)
Goodwill Industries - Park & Ride Lot 24 – P.M. 27.1 - David Good, (619) 708-3071

File: 11- SD-805
K.P.: 42.75
P.M.: 26.5 – 28.7
E.A.: 2T0401

13. Indicate the anticipated Right of Way schedule and lead time requirements. (Discuss if District proposes less than formula lead time and/or if significant pressures for project advancement are anticipated.) PYPSCAN lead time 18 mos. Minimum Right of Way lead time requested from receipt of final maps to certification 15 mos. [ ] See attached.

14. Is it anticipated that all Right of Way work will be performed by Caltrans staff?
Yes X No____ (If no, explain.)

ASSUMPTIONS & LIMITING CONDITIONS

[ ] The mapping did not provide sufficient detail to determine the limits of the right of way required.

[ ] The transportation facilities have not been sufficiently designed so our estimator could determine the damages to any of the remainder parcels affected by the project.

[ ] Additional right of way requirements are anticipated, but are not defined due to preliminary nature of early design requirements.

[ ] See attached

Evaluations prepared by:

1. R/W Signature _____ Date 3, 25, 2008
Joseph A. Quintero

2. Railroad Signature _____ Date 3, 26, 2008
Rosa Macias

3. Utilities Signature _____ Date 3, 26, 2008
Christina Van Wanseele

4. Proj.Coord. Signature _____ Date 3, 27, 08
Debra Fleming

I have personally reviewed the R/W Data Sheet and supporting information. I certify that the probable highest and best use, estimated values, escalation rates, and assumptions are reasonable and proper subject to the limiting conditions set forth, and I find this Data Sheet complete and current.

JANET SCHAFFER
Deputy District Director
Right of Way

By: _____
PAT KIPLING, CHIEF
Program/Project Coordination & Estimating
Right of Way

RAILROAD CONSTRUCTION-FLAGGING NOTES

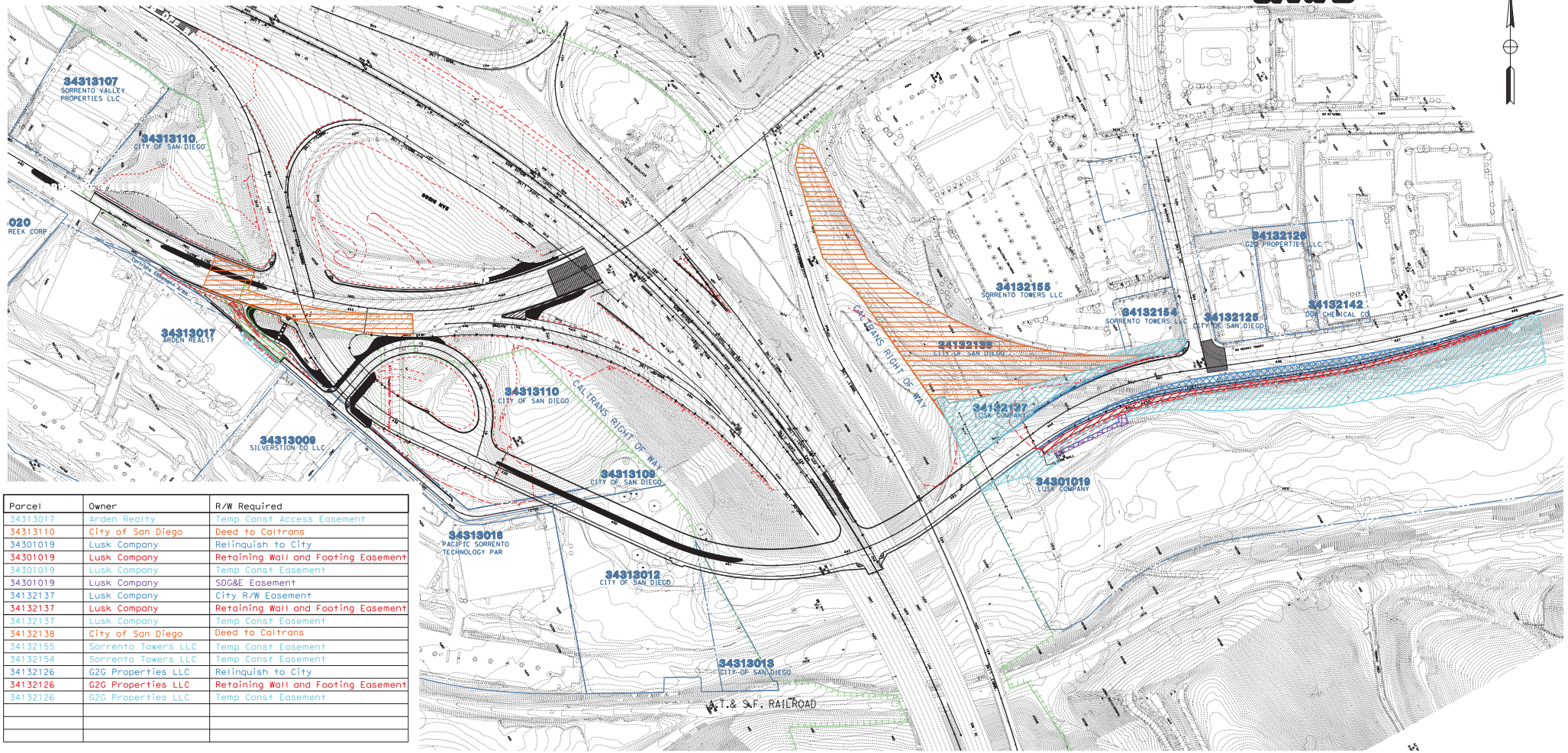
- The construction within the railroad corridor should be the highway contractor's first order of business.
- The "construction-flagging" estimate should be based upon the total number of hours that the highway contractor would have to work within the Railroad's Right of Way 25' of centerline in order to complete the required construction.
- Construction-flagging costs should be estimated using $100/hour.
- Once the construction-flagging estimate is calculated, the estimate should be escalated by 25% for contingencies.

We recommend that the highway contractor be held liable for *all* flagging costs in excess of the flagging estimate. If not all costs then set the liability at $100/hour and *not* at a specific dollar amount such as $500/day.

NOTE: Cost figures are an estimate used for programming purposes only. Information in this data sheet is intended for internal purposes only.

I-805/CARROLL CANYON ROAD EXTENSION PROJECT

TO DEL MAR



Parcel	Owner	R/W Required
34313017	Arden Realty	Temp Const Access Easement
34313110	City of San Diego	Deed to Caltrans
34301019	Lusk Company	Relinquish to City
34301019	Lusk Company	Retaining Wall and Footing Easement
34301019	Lusk Company	Temp Const Easement
34301019	Lusk Company	SDG&E Easement
34132137	Lusk Company	City R/W Easement
34132137	Lusk Company	Retaining Wall and Footing Easement
34132137	Lusk Company	Temp Const Easement
34132138	City of San Diego	Deed to Caltrans
34132155	Sorrento Towers LLC	Temp Const Easement
34132154	Sorrento Towers LLC	Temp Const Easement
34132126	G2G Properties LLC	Relinquish to City
34132126	G2G Properties LLC	Retaining Wall and Footing Easement
34132126	G2G Properties LLC	Temp Const Easement

TO SAN DIEGO

LEGEND

- PRIVATE OWNED PROPERTY NEEDED FOR CARROLL CANYON PROJECT DURING CONSTRUCTION (UNIT 2)
- CITY OWNED PROPERTY TO BE DEEDED BY CITY TO THE STATE (UNIT 1)
- PRIVATE PROPERTY TO BE ACQUIRED BY STATE IN CITY'S NAME (UNIT 2)
- PRIVATE PROPERTY NEEDED FOR CITY'S PERMANENT EASEMENT (UNIT 2)
- PRIVATE PROPERTY NEEDED FOR SDG&E'S PERMANENT EASEMENT (UNIT 2)

RIGHT OF WAY EXHIBIT

NO SCALE

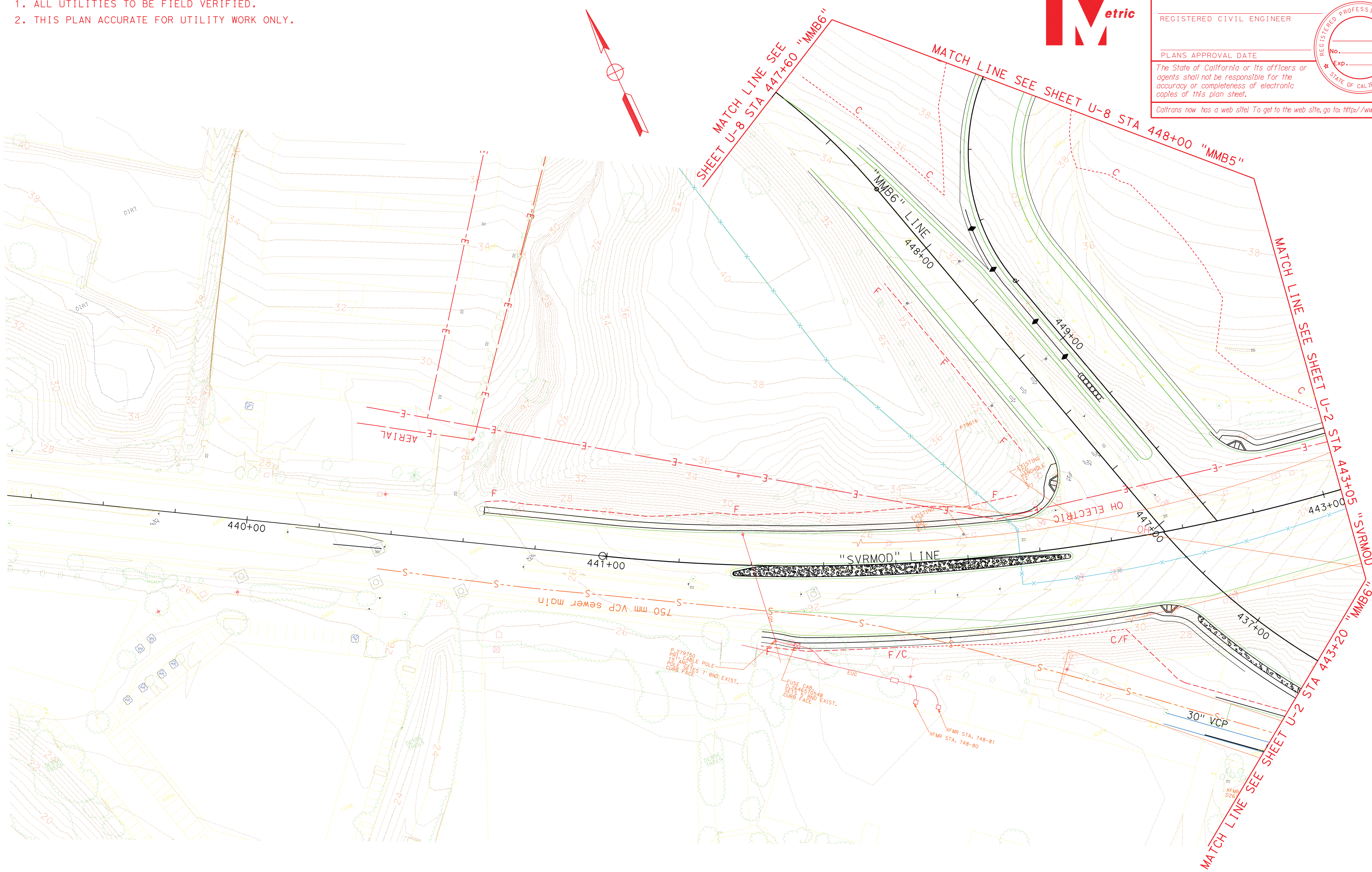
RW_FEE_121008.dgn 12/11/2008 1:09:41 PM

Attachment C

Preliminary Utility Information

NOTES:

1. ALL UTILITIES TO BE FIELD VERIFIED.
2. THIS PLAN ACCURATE FOR UTILITY WORK ONLY.



DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	KP R42.6 / R46.2 PM R26.5 / R28.7		XXX

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER No. Exp. STATE OF CALIFORNIA

Caltrans Metric

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN.

SCALE 1:500

UTILITY PLAN

U-01

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER

X. XXXXXXX

CALCULATED/DESIGNED BY | CHECKED BY | DATE | REVISED BY | DATE REVISED

USERNAME => tbagbudi

LAST REVISION

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	KP R42.6 / R46.2 PM R26.5 / R28.7		XXX

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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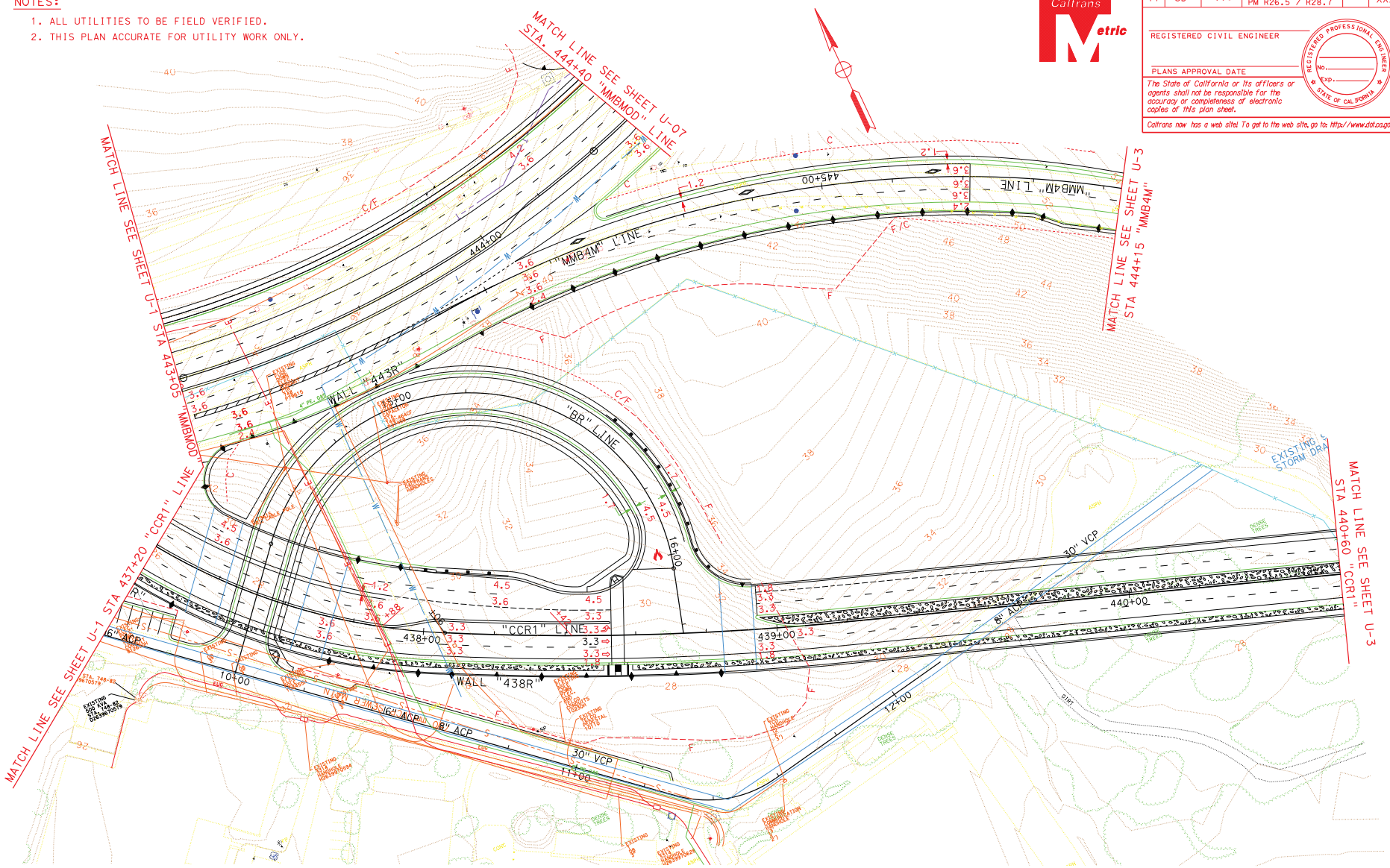

UTILITY PLAN

U-02

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SCALE 1:500

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER X. XXXXXXX

CALCULATED/DESIGNED BY | CHECKED BY | DATE | REVISED BY | DATE REVISED

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbaabudi
DGN FILE => b2T0401m02.dgn

CU 11275

EA 2T0401

LAST REVISION 03-08-08

DATE PLOTTED => 07-MAR-2008
TIME PLOTTED => 10:17

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	KP R42.6 / R46.2 PM R26.5 / R28.7		XXX

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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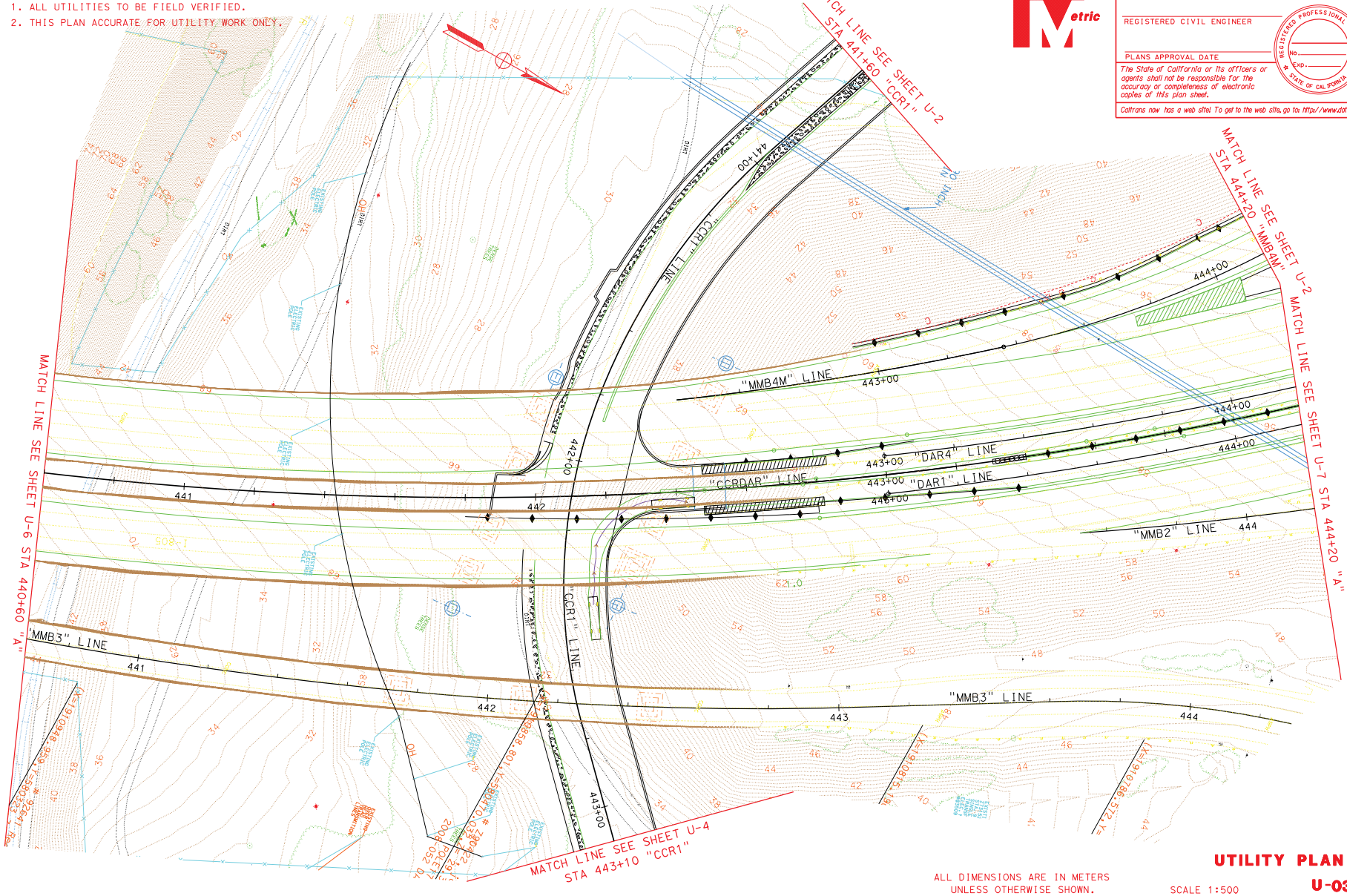

ALL DIMENSIONS ARE IN METERS
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SCALE 1:500

UTILITY PLAN

U-03

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER X. XXXXXXX

CALCULATED/DESIGNED BY

CHECKED BY

DATE

REVISED BY

DATE REVISED

LAST REVISION 03-08-08

DATE PLOTTED => 07-MAR-2008
TIME PLOTTED => 10:18

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DGN FILE => b2T0401m03.dgn

CU 11275

EA 2T0401

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	KP R42.6 / R46.2 PM R26.5 / R28.7		XXX

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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Caltrans Metric

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	KP R42.6 / R46.2 PM R26.5 / R28.7		XXX

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
NO.
EXP.
STATE OF CALIFORNIA

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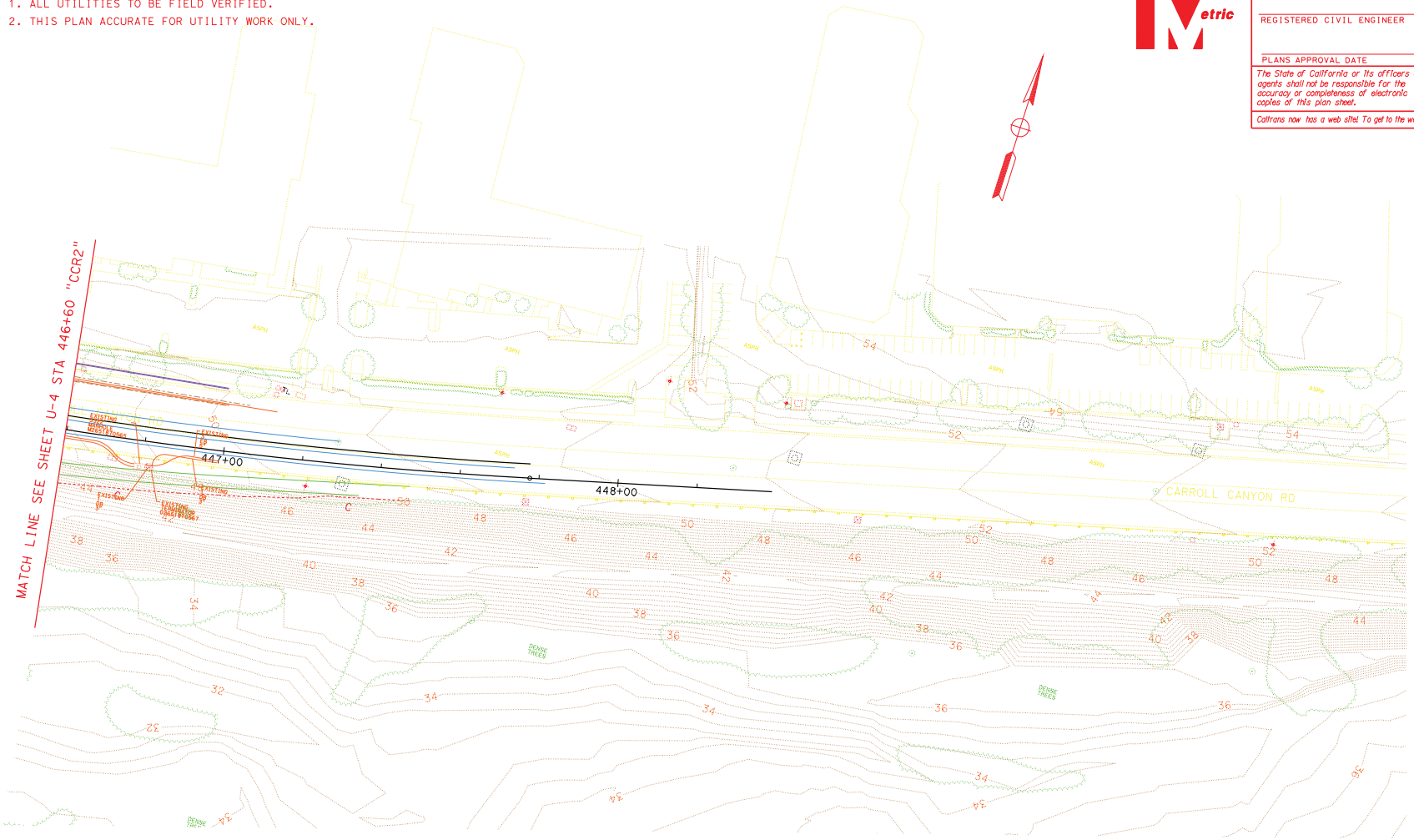

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SCALE 1:500

UTILITY PLAN

U-05

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER X. XXXXXXX

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DATE REVISED

LAST REVISION 03-08-08

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TIME PLOTTED => 10:19

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USERNAME => tbaabudi
DGN FILE => b2T0401m05.dgn

CU 11275

EA 2T0401

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	KP R42.6 / R46.2 PM R26.5 / R28.7		XXX

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
No.
Exp.
STATE OF CALIFORNIA

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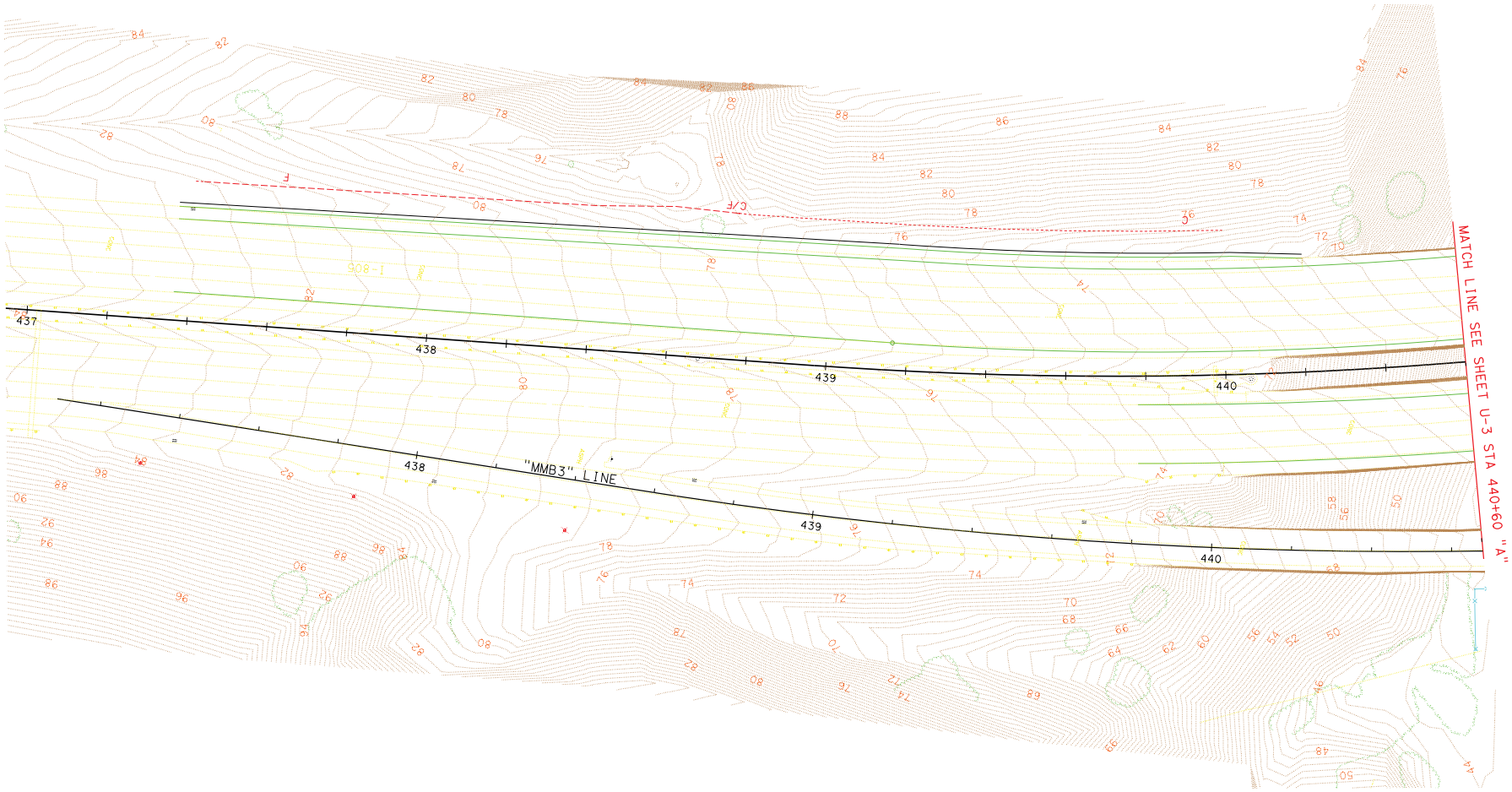

ALL DIMENSIONS ARE IN METERS
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SCALE 1:500

UTILITY PLAN

U-06

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER X. XXXXXXX

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DATE REVISED

LAST REVISION 03-08-08

DATE PLOTTED => 07-MAR-2008

TIME PLOTTED => 10:19

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USERNAME => tbaabudi

DGN FILE => b2T0401m06.dgn

CU 11275

EA 2T0401

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	KP R42.6 / R46.2 PM R26.5 / R28.7		XXX

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PLANS APPROVAL DATE

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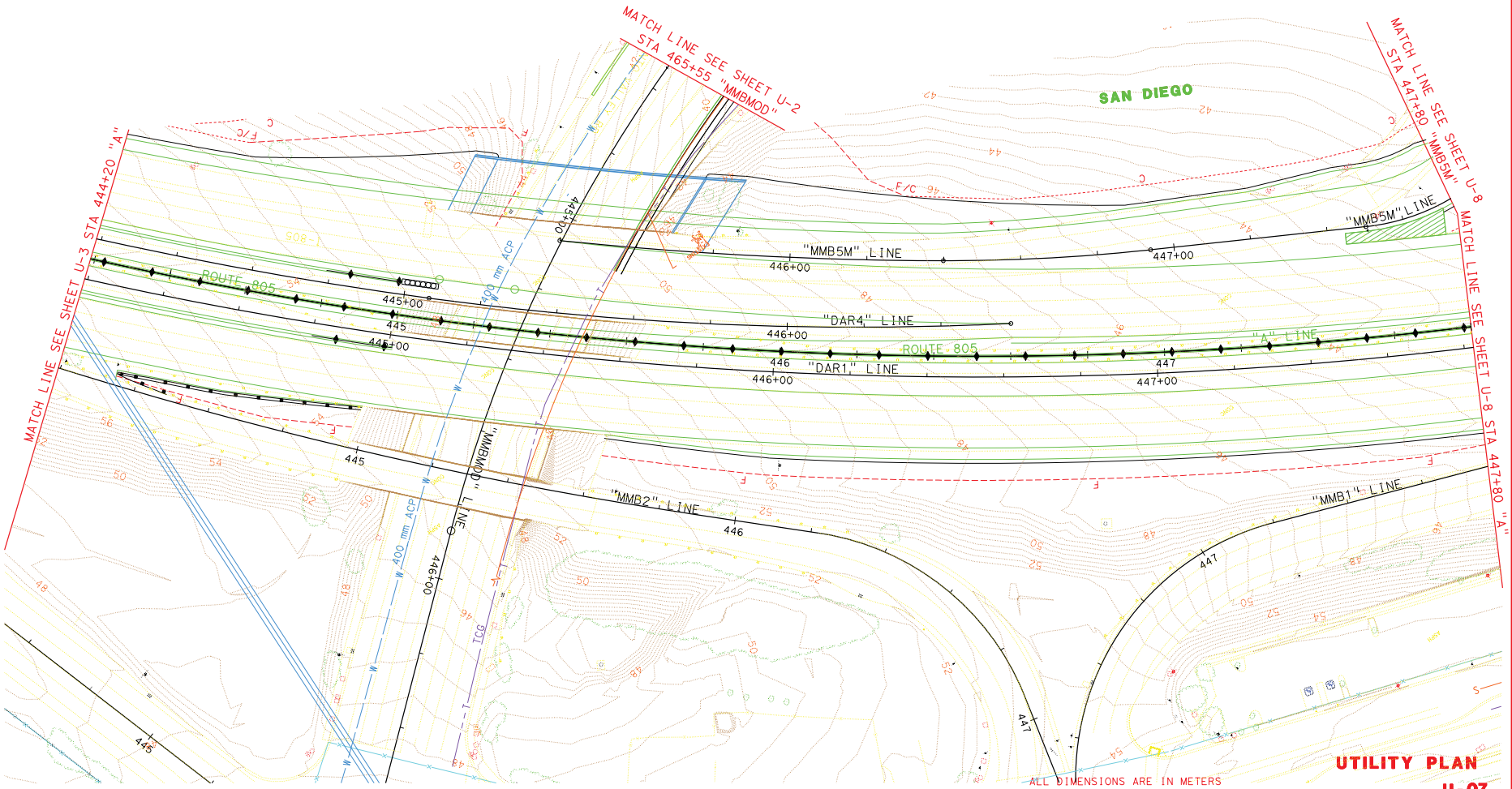

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SCALE 1:500

UTILITY PLAN

U-07

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER X. XXXXXXX

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LAST REVISION 03-08-08 | DATE PLOTTED => 07-MAR-2008 | TIME PLOTTED => 10:19

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USERNAME => tbaabudi
DGN FILE => b2T0401m07.dgn

CU 11275

EA 2T0401

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	KP R42.6 / R46.2 PM R26.5 / R28.7		XXX

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — STATE OF CALIFORNIA

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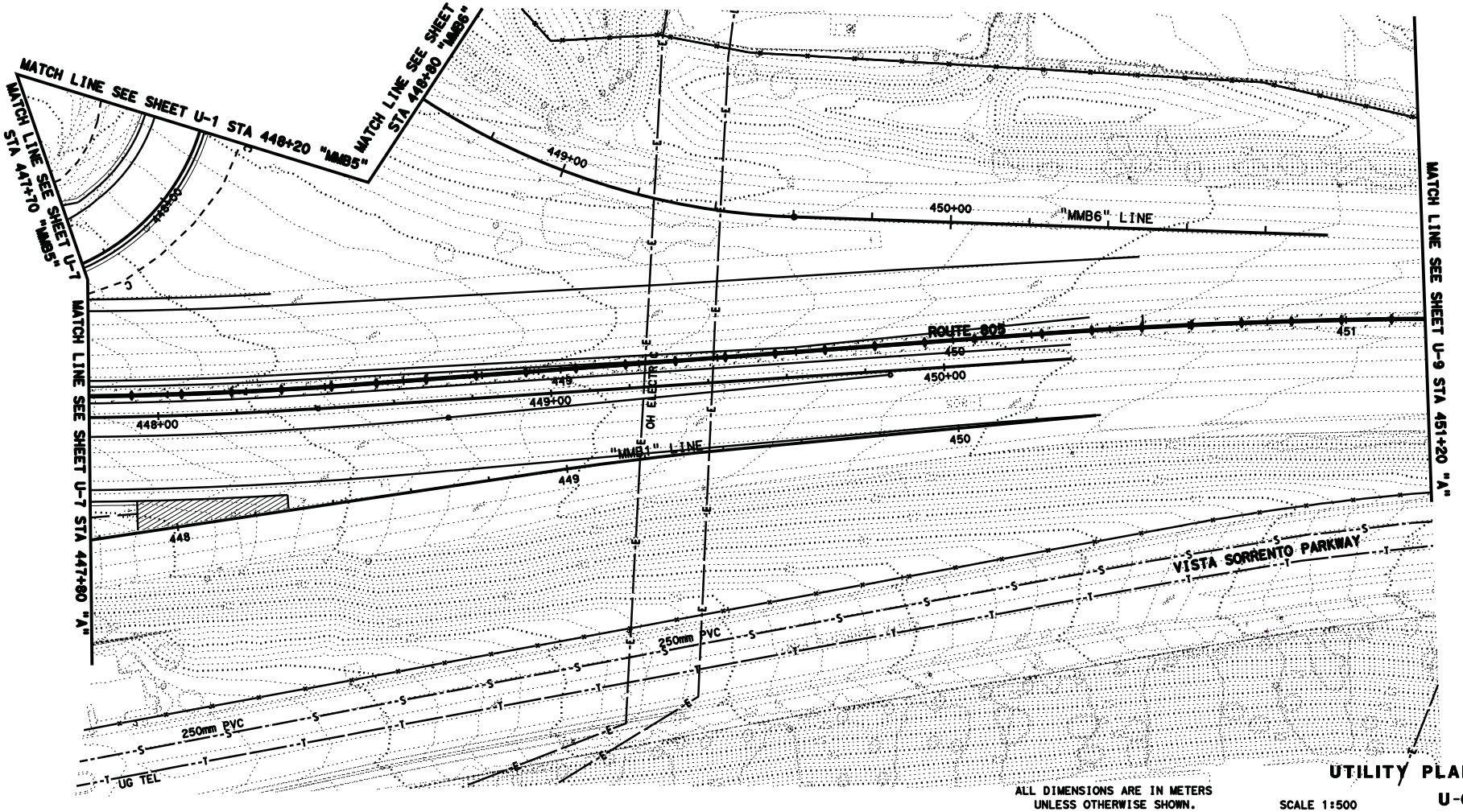

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SCALE 1:500

UTILITY PLAN

U-08

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER X. XXXXXXX

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	KP R42.6 / R46.2 PM R26.5 / R28.7		XXX

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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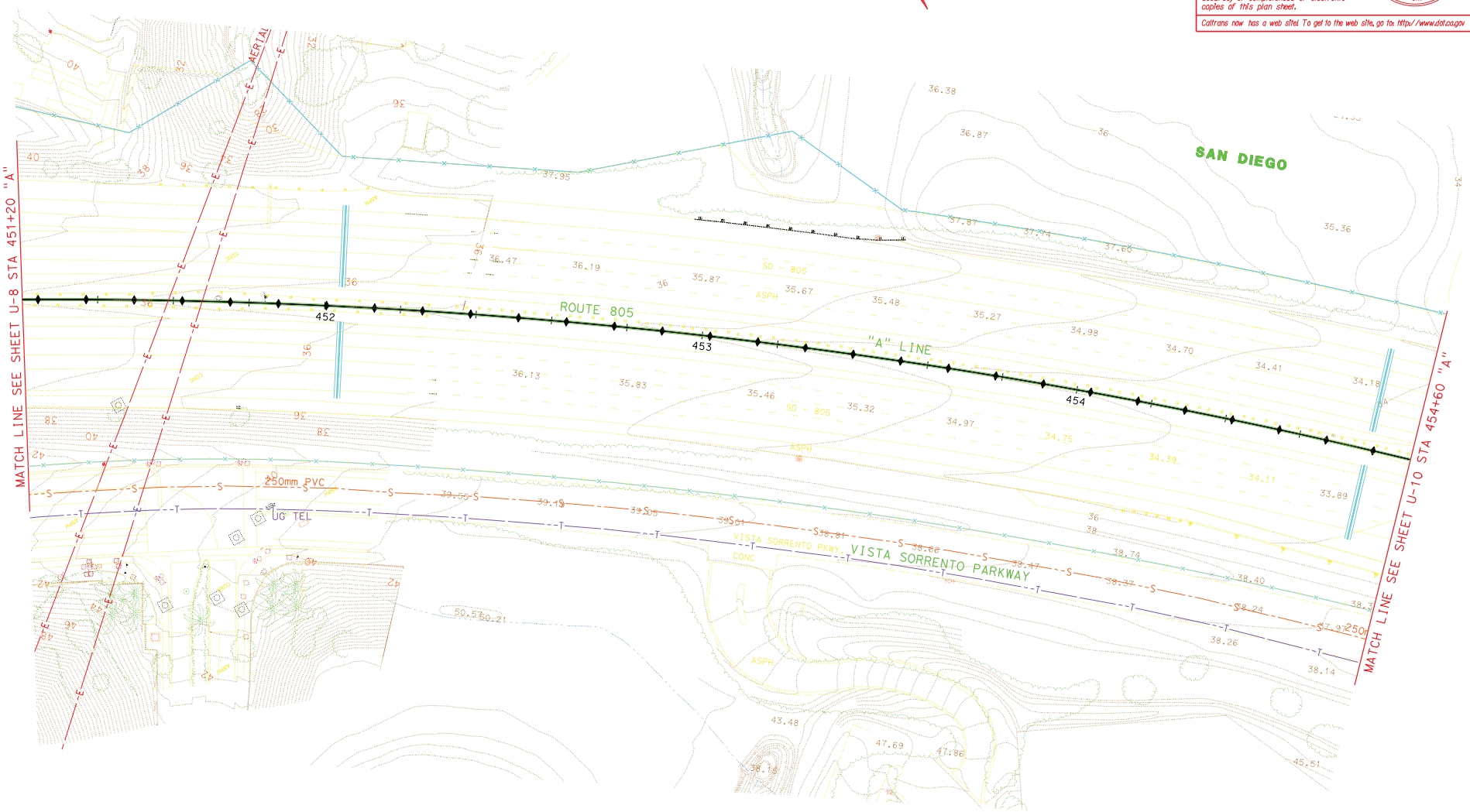

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SCALE 1:500

UTILITY PLAN

U- 09

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER X. XXXXXXX

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CHECKED BY | DATE REVISED

LAST REVISION

USERNAME => tbagbudi | CU 11275 | EA 2T0401

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	KP R42.6 / R46.2 PM R26.5 / R28.7		XXX

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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Caltrans Metric

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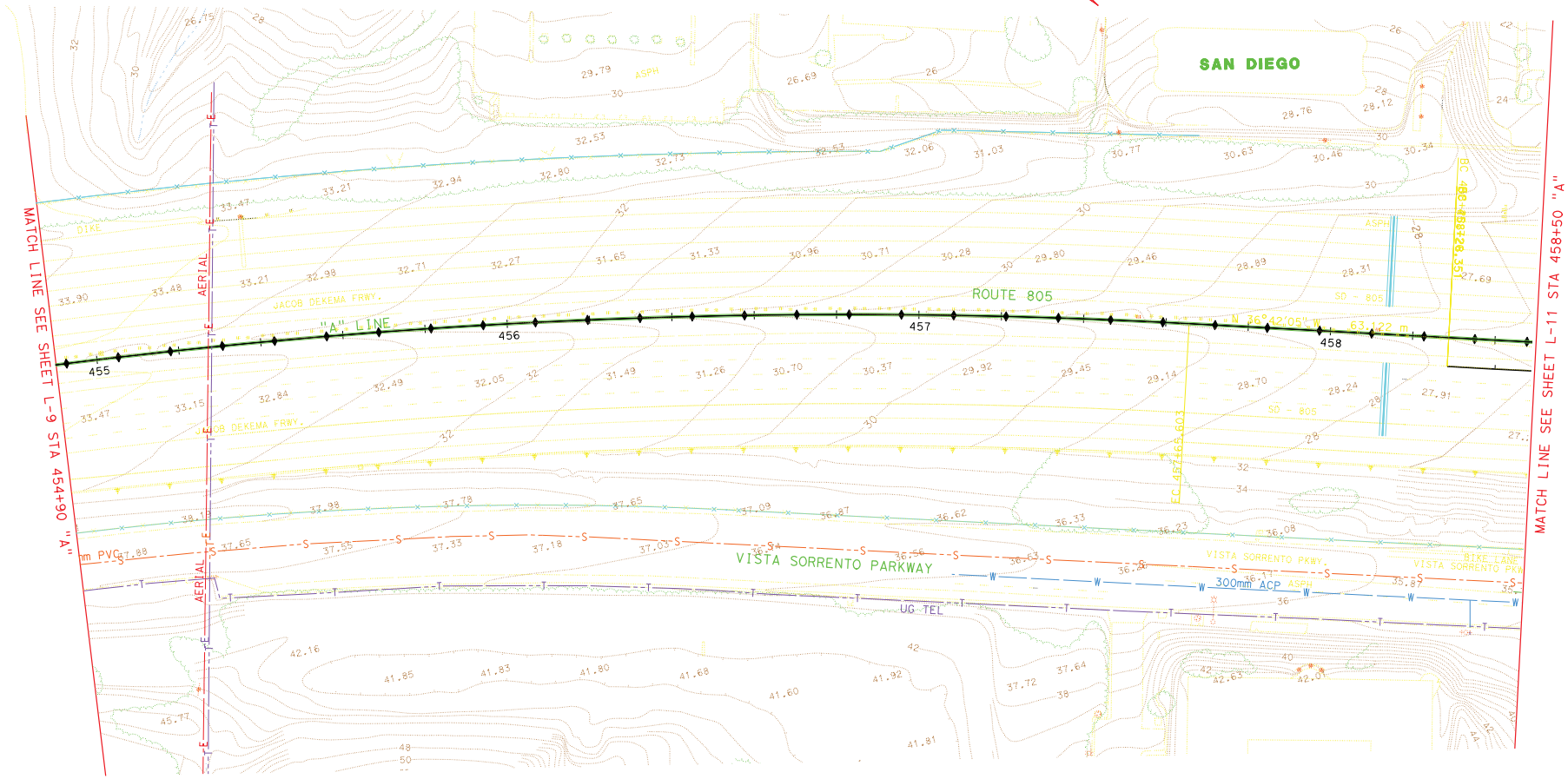

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SCALE 1:500

UTILITY PLAN

U-10

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER X. XXXXXXX

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DATE REVISED

LAST REVISION 03-08-08

DATE PLOTTED => 07-MAR-2008

TIME PLOTTED => 10:20

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USERNAME => tbaabudi

DGN FILE => b2T0401m10.dgn

CU 11275

EA 2T0401

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	KP R42.6 / R46.2 PM R26.5 / R28.7		XXX

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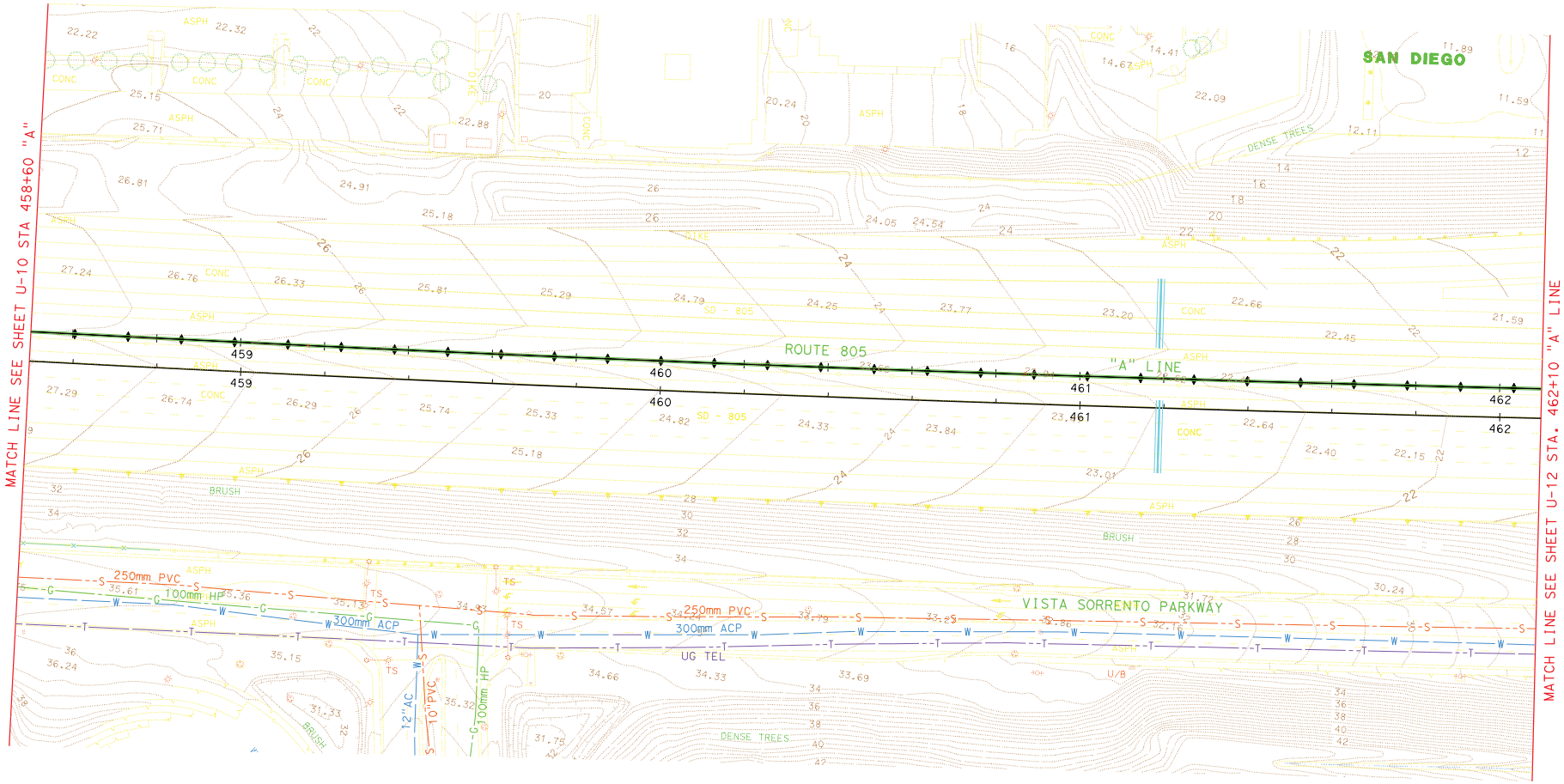

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SCALE 1:500

UTILITY PLAN

U-11

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER X. XXXXXXX

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USERNAME => tbgabudi | CU 11275 | EA 2T0401

LAST REVISION

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	KP R42.6 / R46.2 PM R26.5 / R28.7		XXX

REGISTERED CIVIL ENGINEER

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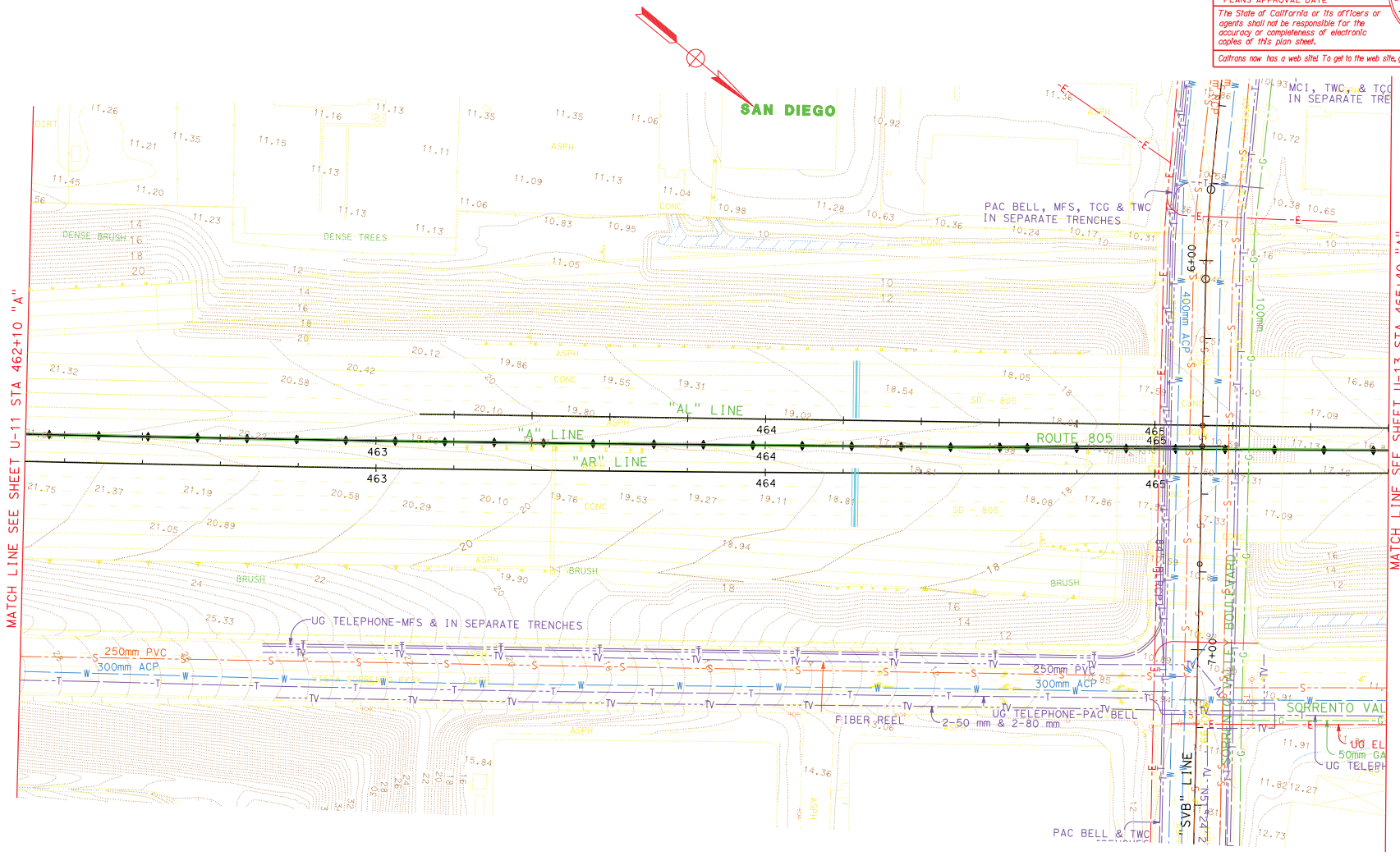

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SCALE 1:500

UTILITY PLAN

U-12

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans PROJECT DEVELOPMENT

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TIME PLOTTED => 10:21

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DGN FILE => b2T0401m12.dgn

CU 11275

EA 2T0401

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	KP R42.6 / R46.2 PM R26.5 / R28.7		XXX

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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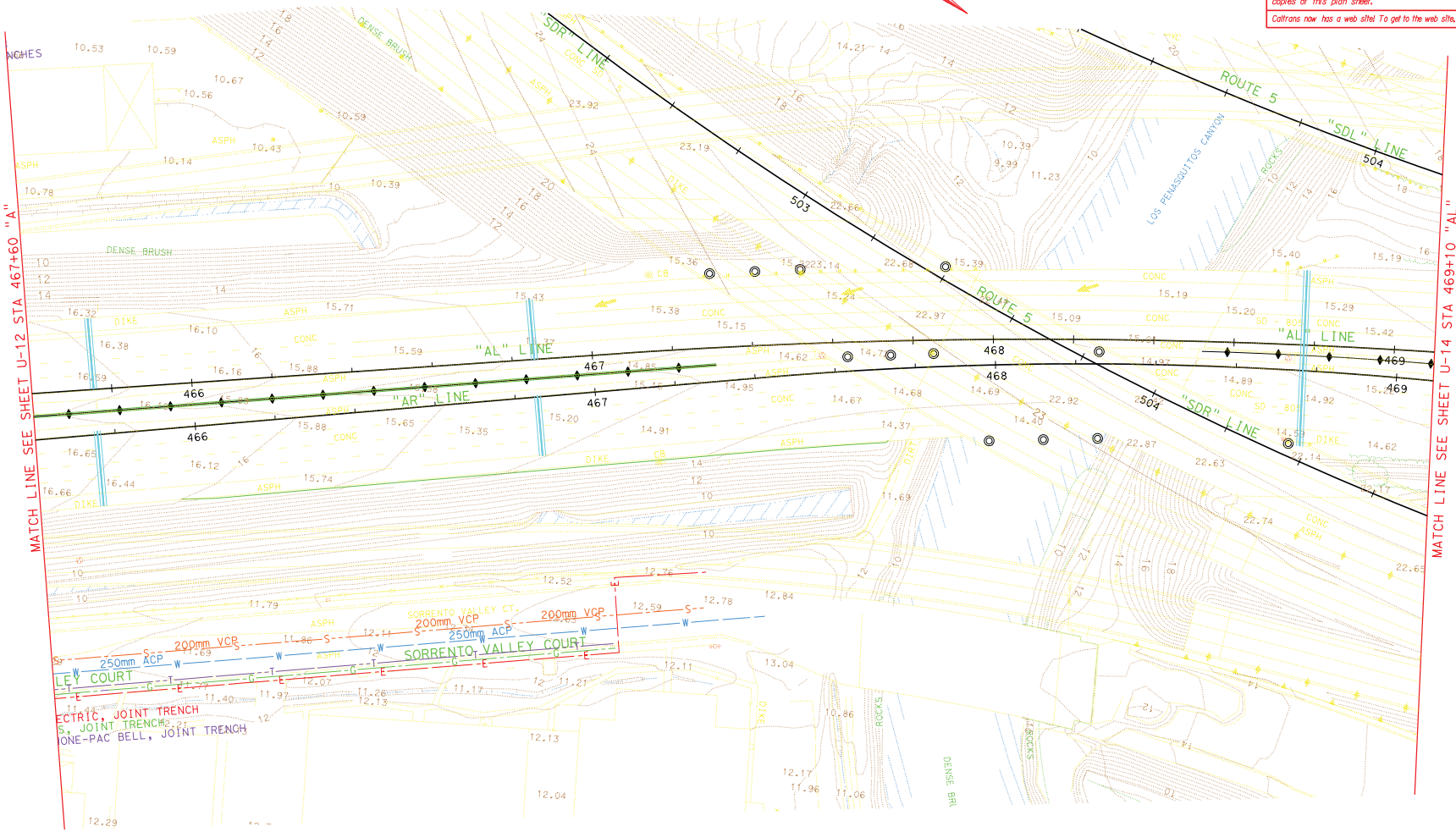

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SCALE 1:500

UTILITY PLAN

U-13

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER X. XXXXXXX

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LAST REVISION 03-08-08 | DATE PLOTTED => 07-MAR-2008 | TIME PLOTTED => 10:21

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DGN FILE => b2T0401m13.dgn

CU 11275

EA 2T0401

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	KP R42.6 / R46.2 PM R26.5 / R28.7		XXX

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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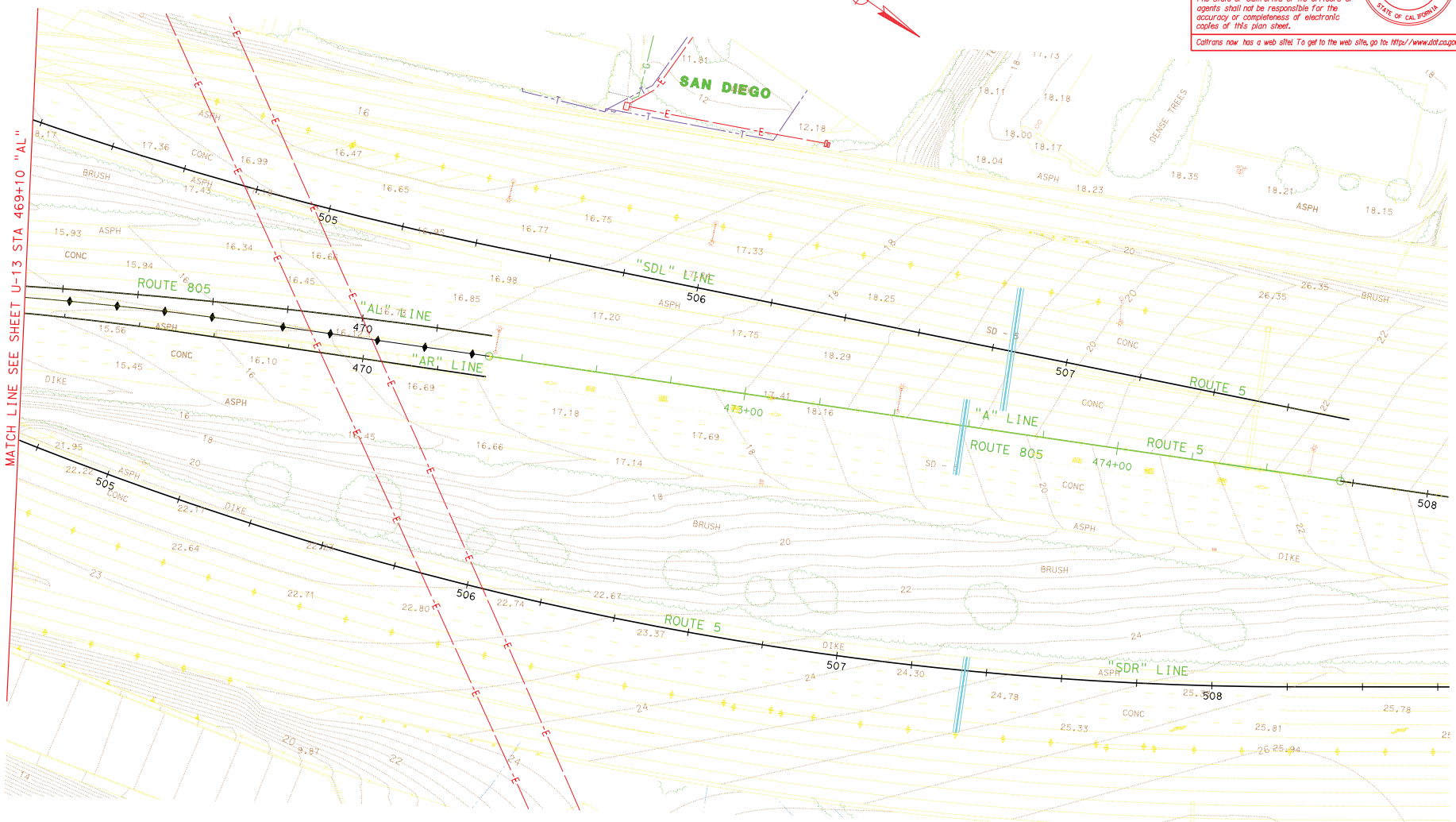

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SCALE 1:500

UTILITY PLAN

U-14

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER X. XXXXXXX

CALCULATED/DESIGNED BY

CHECKED BY

DATE | REVISED BY | DATE REVISED

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => tbaabudi
DGN FILE => b2T0401m14.dgn

CU 11275

EA 2T0401

LAST REVISION 03-08-08

DATE PLOTTED => 07-MAR-2008
TIME PLOTTED => 10:22

Attachment D

Build Alternative 11-Page Estimate

11- PAGE ESTIMATE

~~11-EA~~ 2T0400

Type of Estimate : PROJECT COST ESTIMATE FOR CARROLL CANYON ROAD PROJECT

Program Code :

Project Limits : 11-SD-805, KP 42.6 TO KP 46.2 (PM 26.4 TO PM 27.7)

Description: **Extend Carrol Canyon Road from East of I-805 to West and connect to Sorrento Vally Blvd.**

Scope :

Alternative :

		Current Cost		Escalated Cost
ROADWAY ITEMS	$	29,435,600.00	$	30,786,978.00
STRUCTURE ITEMS	$	50,217,100.00	$	52,522,548.00
SUBTOTAL CONSTRUCTION COST	$	79,652,700.00	$	83,309,526.00
RIGHT OF WAY	$	2,870,000.00	$	2,870,000.00
TOTAL CAPITAL COST	**$**	**82,523,000.00**	**$**	**86,180,000.00**
PR/ED SUPPORT	$	1,500,000.00	$	1,780,800.00
PS&E SUPPORT	$	6,800,000.00	$	8,073,000.00
RIGHT OF WAY SUPPORT	$	850,000.00	$	850,000.00
CONSTRUCTION SUPPORT	$	10,300,000.00	$	12,417,000.00
TOTAL SUPPORT COST	**$**	**19,450,000.00**	**$**	**23,120,800.00**
TOTAL PROJECT COST	**$**	**102,000,000.00**	**$**	**110,000,000.00**

	month	year
Date (Month/Year) of Estimate	1	2009
Estimated Date (Month/Year) of Construction	12	2009
Number of Months of Escalation	11	
Number of Years of Escalation	0.92	
If Project has been programmed enter Programmed Amount	$	-
Number of Working Days	500	
Number of Plant Establishment Days	0	

Estimated Project Schedule

PID Approval	
PA/ED Approval	March-09
PS&E	April-09
RTL	June-09
Begin Construction	Dec-09

Reviewed by District 0.E. L. G. Edmonds 1/22/09 (619) 688-6735

Leon G. Edmonds District 11 Office Engineer **Date** **Phone**

Approved by Project Manager Arturo Jacobo 1-22-09 (619) 688-6816

Arturo Jacobo Project Manager **Date** **Phone**

[4] Escalation rates used on this estimate for Support Cost are 12% for FY 07/08, 6% for FY 08/09, and 3% for FY 09/10 and each year beyond. Escalation rates used in this estimate for Highway Construction Capital Costs are 5.0% compounded annually to Construction year. These rates are different than the suggested 2006 STIP of 8.3% for fiscal year 05/06 and 3.0% thereafter. The decision to use 5.0% for this estimate was as per the Office of Office Engineer. (REV010709)

I. ROADWAY ITEMS

Section				Cost
1	**Earthwork**		$	1,169,300
2	**Structural Section**		$	9,082,500
3	**Drainage**		$	472,400
4	**Specialty Items**		$	1,950,300
5	**Environmental**		$	2,164,900
	5A Environmental Mitigation	$ 125,920		
	5B Landscape and Irrigation	$ 1,655,130		
	5C NPDES	$ 383,819		
6	**Traffic Items**		$	2,597,200
	6A Electrical	$ 1,205,000		
	6B Signing and Striping	$ 845,200		
	6C Traffic Management Plan	$ 30,000		
	6D Traffic Control	$ 517,000		
7	**Detours**		$	-
8	**Minor Items**		$	774,400
9	**Roadway Mobilization**		$	1,626,100
10	**Supplemental Work**		$	1,316,400
11	**State Furnished**		$	931,300
12	**Contingencies**		$	4,026,900
13	**Overhead**			$3,323,900
	TOTAL ROADWAY ITEMS		**$**	**29,435,600**

Estimate Prepared By :

Name and Title | Date | Phone

Estimate Reviewed By : Majid Kharrati, Majid Kharrati 1.22.09

Name and Title | Date | Phone

By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

SECTION 1 EARTHWORK

Item code		Unit	Quantity		Unit Price ($)			Cost
190101	Roadway Excavation	M3	80,000	x	13.00	=	$	1,040,000
190103	Roadway Excavation (Type Y) ADL	M3		x		=	$	-
190105	Roadway Excavation (Type Z-2) ADL	M3	3,174	x	30.00	=	$	95,220
194001	Ditch Excavation	M3		x		=	$	-
198001	Imported Borrow	M3		x		=	$	-
198007	Imported Material (Shoulder Backing)	Tonne		x		=	$	-
192037	Structure Excavation (Retaining Wall)	M3		x		=	$	-
193013	Structure Backfill (Retaining Wall)	M3		x		=	$	-
193031	Pervious Backfill Material (Retaining Wall)	M3		x		=	$	-
160101	Clearing & Grubbing	LS	1	x	24,000.00	=	$	24,000
170101	Develop Water Supply	LS	1	x	10,000.00	=	$	10,000

TOTAL EARTHWORK SECTION ITEMS $ 1,169,300

Section 2 STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)			Cost
401000	Concrete Pavement	M3	11,000	x	300.00	=	$	3,300,000
404092	Seal Pavement Joint	M	10,368	x	3.00	=	$	31,104
404094	Seal Longitudinal Isolation Joint	M	6,715	x	6.00	=	$	40,290
413115	Seal Existing Concrete Pavement Joint	M		x		=	$	-
401108	Replace Concrete Pavement (Rapid Strength Concrete)	M3		x		=	$	-
390132	HMA (Type A)	Tonne	12,000	x	110.00	=	$	1,320,000
390126	Rubberized HMA (Type G)	Tonne		x		=	$	-
393001	Pavement Reinforcing Fabric	M2		x		=	$	-
039350A	Rock Mulch	M2	1,540		95.00		$	146,300
200114	Rock Blanket	M2	330		130.00		$	42,900
260201	Class 2 Aggregate Base	M3	25,000	x	45.00	=	$	1,125,000
290201	Asphalt Treated Permeable Base	M3	24,000	x	80.00	=	$	1,920,000
250401	Class 4 Aggregate Subbase	M3		x		=	$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	Tonne	3	x	455.00	=	$	1,365
397005	Tack Coat	Tonne	1	x	2,500.00	=	$	2,500
377501	Slurry Seal	Tonne		x		=	$	-
3750XX	Screenings (Type XX)	Tonne		x		=	$	-
374492	Asphaltic Emulsion (Polymer Modified)	Tonne		x		=	$	-
365001	Sand Cover	Tonne		x		=	$	-
731530	Minor Concrete (Textured Paving)	M2	1,070	x	125.00	=	$	133,750
731521	Minor Concrete (Sidewalk)	M3	240	x	440.00	=	$	105,600
510123A	Minor Concrete (Raised Median)	M3	100	x	900.00	=	$	90,000
731504	Minor Concrete (Curb and Gutter)	M3	309	x	585.00	=	$	180,765
41141A	Architectural Treatment (Cobblestone Texture)	M2	2,000		150.00		$	300,000
731502	Minor Concrete (Misc. Const.)	M3	434		580.00		$	251,720
394001	Place Asphalt Concrete Dike	M	1,344		10.00		$	13,440
150771	Remove Asphalt Concrete Dike	M		x		=	$	-
420201	Grind Existing Concrete Pavement	M2		x		=	$	-
150860	Remove Base and Surfacing	M3	1,254	x	23.00	=	$	28,842
390095	Replace Asphalt Concrete Surfacing	M3		x		=	$	-
1532XX	Remove Concrete (type)	M3		x		=	$	-
394002	Place Asphalt Concrete (Misc. Area)	M2	57	x	100.00	=	$	5,700
153103	Cold Plane Asphalt Concrete Pavement	M2	8,640	x	5.00	=	$	43,200
394050	Rumble Strip	STA		x		=	$	-
413112A	Repair Spalled Joints (Polyester Grout)	M2		x		=	$	-
420102	Groove Existing Concrete Pavement	M2		x		=	$	-

TOTAL STRUCTURAL SECTION ITEMS $ 9,082,500

SECTION 3 DRAINAGE

Item code		Unit	Quantity		Price			Amount
150805	Remove Culvert	M		x		=	$	-
150820	Modify Inlet	EA	4	x	730.00	=	$	2,920
193114	Sand Backfill	M3	17	x	300.00	=	$	5,100
150206	Abandon Culvert	M	3	x	2,000.00	=	$	6,000
152430	Adjust Inlet	M		x		=	$	-
155003	Cap Inlet	EA	2	x	1,700.00	=	$	3,400
193118	Concrete Backfill	EA	5	x	400.00	=	$	2,000
510502	Minor Concrete (Minor Structure)	M3	87	x	1,800.00	=	$	156,600
510512	Minor Concrete (Box Culvert)	M3		x		=	$	-
620909	450 mm APC	M	132	x	300.00	=	$	39,600
620913	600 mm APC	M	360	x	275.00	=	$	99,000
620919	750 mm APC	M	29	x	400.00	=	$	11,600
650069	450 mm RCP	M	29	x	300.00	=	$	8,700
650075	600 mm RCP	M	6	x	1,000.00	=	$	6,000
650077	750 mm RCP	M	13	x	725.00	=	$	9,425
665834	450 mm Bit Coated CSP (2.77 mm Thick)	M	4	x	1,500.00	=	$	6,000
698169	600 mm Alternative Pipe Downdrain	M	15	x	500.00	=	$	7,500
707471	900 mm Precast Concrete Pipe Riser	M	8	x	4,500.00	=	$	36,000
721008	RSP (Light Method B)	M3	26	x	510.00	=	$	13,260
72XXXX	Rock Slope Protection (Type and Method)	M3		x		=	$	-
729010	Rock Slope Protection Fabric	M2	22	x	12.00	=	$	264
721420	Concrete (Ditch Lining)	M3		x		=	$	-
721430	Concrete (Channel Lining)	M3	5	x	1,000.00	=	$	5,000
721431	Concrete (Conc Apron)	M3	7	x	1,000.00	=	$	7,000
750001	Miscellaneous Iron and Steel	KG	9,388	x	5.00	=	$	46,940
XXXXXX	Additional Drainage	LS		x		=	$	-

TOTAL DRAINAGE ITEMS $ 472,400

SECTION 4 SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)			Cost
070012	Progress Schedule (Critical Path Method)	LS	1	x	10,000.00	=	$	10,000
220101	Finishing Roadway	LS	1	x	15,000.00	=	$	15,000
518002	Sound Wall (Masonry Block)	M2		x		=	$	-
510524	Minor Concrete (Sound Wall)	M3		x		=	$	-
150608	Remove Concrete Barrier (Type K)	M	0	x	2.00	=	$	-
153250	Remove Sound Wall	M2		x		=	$	-
150608	Remove Chain Link Fence	M	444	x	10.00	=	$	4,440
190110	Lead Compliance Plan	LS	1	x	5,000.00	=	$	5,000
1532XX	Remove Barrier (*Insert Type*)	M		x		=	$	-
150662	Remove Metal Beam Guard Railing	M	4,600	x	18.00	=	$	82,800
150668	Remove Terminal Systems	EA		x		=	$	-
80XXXX	Fence (*Insert Type*)	M		x		=	$	-
800391	Chain Link Fence (Type CI-1.8)	M	1,000	x	46.00	=	$	46,000
802672	4.9 M Chain Link Gate (Type CI-1.8)	M	1	x	3,000.00	=	$	3,000
80XXXX	Gate (Insert *Type*)	EA		x		=	$	-
832001	Metal Beam Guard Railing	M	150	x	82.00	=	$	12,300
839301	Single Thrie Beam Barrier	M		x		=	$	-
839310	Double Thrie Beam Barrier	M		x		=	$	-
839521	Cable Railing	M		x		=	$	-
8395XX	Terminal System (Type *CAT*)	EA		x		=	$	-
839568	Terminal Anchor Assembly (Type *SFT*)	EA	1	x	800.00	=	$	800
839585	Alternative Flared Terminal System	EA	2	x	3,000.00	=	$	6,000
839584	Alternative In-line Terminal System	EA	1	x	3,500.00	=	$	3,500
49XXXX	CIDH Concrete Piling (Insert Diameter)	M		x		=	$	-
839XXX	Crash Cushion (Type X)	EA		x		=	$	-
839XXX	Crash Cushion (Absorb 350)	EA	4	x	60,000.00	=	$	240,000
839601	Crash Cushion (Type CAT)	EA	4	x	6,500.00	=	$	26,000
839602	Crash Cushion (Type CAT) Backup	EA	4	x	550.00	=	$	2,200
83XXXX	Concrete Barrier (Type X)	M		x		=	$	-
83XXXX	Concrete Barrier (Type X)	M		x		=	$	-
833080	Concrete Barrier (Type K)	M		x	20.00	=	$	-
833142	Concrete Barrier (Mod Type 26)	M	1,047	x	510.00	=	$	533,970
839701	Concrete Barrier (Type 60)	M	2,730	x	185.00	=	$	505,050
839702	Concrete Barrier (Type 60A)	M	225	x	200.00	=	$	45,000
839703	Concrete Barrier (Type 60C)	M	271	x	250.00	=	$	67,750
839704	Concrete Barrier (Type 60D)	M		x	195.00	=	$	-
O41268	Concrete Barrier (Mod Type 60D)	M	303	x	325.00	=	$	98,475
839709	Concrete Barrier (Type 60GE)	M	74	x	700.00	=	$	51,800
839725	Concrete Barrier (Type 736)	M	1,049	x	175.00	=	$	183,575
520103	Bar Reinf. Steel (Ret. Wall)	KG		x		=	$	-
510408	Class 1 Concrete (Retaining Wall)	M3		x		=	$	-
510133	Class 2 Concrete (Retaining Wall)	M3		x		=	$	-
510060	Structural Concrete (Retaining Wall)	M3		x		=	$	-
513553	Retaining Wall (Masonry Wall)	M3		x		=	$	-
5110XX	Architectural Treatment (Type)	M2		x		=	$	-
511048	Apply Anti-Graffiti Coating	M2		x		=	$	-
5136XX	Reinforced Concrete Crib Wall (Type X)	M2		x		=	$	-
83954X	Transition Railing (Insert Type)	EA		x		=	$	-
839541	Transition Railing (Type WB)	EA	2	x	3,800.00	=	$	7,600
597601	Prepare and Stain Concrete	M2		x		=	$	-
839561	Rail Tensioning Assembly	EA		x		=	$	-
8395XX	End Anchor Assembly (*Insert Type X*)	EA		x		=	$	-

TOTAL SPECIALTY ITEMS $ 1,950,300

Section 5 ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Price		Amount
	Biological Mitigation	LS		x		=	$ -
071325	Temporary Fence (Type ESA)	M	192	x	10.00	=	$ 1,920
	CSS Mitigation	LS	1	x	100,000.00		$ 100,000
	Wetland Enhancement	LS	1	x	24,000.00		$ 24,000

Subtotal Environmental *$ 125,920*

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Price		Amount
200001	Highway Planting	LS	1	x	400,000.00	=	$ 400,000
208000	Irrigation System	LS	1	x	600,000.00	=	$ 600,000
204099	Plant Establishment Work	LS	1	x	150,000.00	=	$ 150,000
204101	Extend Plant Establishment (X Years)	LS		x		=	$ -
200101	Imported Topsoil	M3	47	x	100.00	=	$ 4,700
20XXXX	___ mm (*Insert Type*) Conduit *(Use for Irrigation x-overs)*	M		x		=	$ -
208731	200 MM corrugated High Density Polyethylene Pipe Conduit	M	50	x	220.00	=	$ 11,000
208732	250 MM corrugated High Density Polyethylene Pipe Conduit	M	100	x	250.00	=	$ 25,000
208797	150 MM Welded Steel Pipe Conduit (6.35 mm thick)	M	90	x	558.00	=	$ 50,220
20XXXX	Extend ___ mm *(Insert Type)* Conduit *(Use for Extension of Irrigation x-overs)*	M		x		=	$ -
208910	Density Pipe Conduit	M	30	x	400.00	=	$ 12,000
203016	Erosion Control (Type D)	M2	67,300	x	1.50	=	$ 100,950
203021	Fiber Rolls	M	16,800	x	8.00	=	$ 134,400
203026	Move In/ Move Out (Erosion Control)	EA	3	x	620.00	=	$ 1,860
209801	Maintenance Vehicle Pullout	EA		x		=	$ -
208304	Water Meter	EA	3	x	55,000.00	=	$ 165,000

Subtotal Landscape and Irrigation *$ 1,655,130*

5C - NPDES

Item code		Unit	Quantity		Price		Amount
074019	Prepare SWPPP	LS	1	x	10,000.00	=	$ 10,000
074016	Construction Site Management	LS	1	x	10,000.00	=	$ 10,000
074017	Prepare WPCP	LS		x		=	$ -
074020	Water Pollution Control	LS		x		=	$ -
074023	Temporary Erosion Control	M2		x		=	$ -
074027	Temporary Erosion Control Blanket	M2		x		=	$ -
074037	Move In/ Move Out (Temporary Erosion Control)	EA	3	x	775.00	=	$ 2,325
074028	Temporary Fiber Roll	M	1,960	x	8.00	=	$ 15,680
074029	Temporary Silt Fence	M	460	x	10.00	=	$ 4,600
074042	Temporary Concrete Washout (Portable)	LS	1	x	15,000.00	=	$ 15,000
074032	Temporary Concrete Washout Facility	EA	10	x	3,650.00	=	$ 36,500
074033	Temporary Construction Entrance	EA	19	x	5,250.00	=	$ 99,750
074035	Temporary Check Dam	M	178	x	38.00	=	$ 6,764
074038	Temp. Drainage Inlet Protection	EA	84	x	300.00	=	$ 25,200
074040	Temp. Hydraulic Mulch (Bonded Fiber Matrix)	M2	93,000	x	1.00	=	$ 93,000
074041	Street Sweeping	LS	1	x	25,000.00	=	$ 25,000
Supplemental Work for NPDES							
066595	Water Pollution Control Maint. Sharing*	LS	1	x	20,000.00	=	$ 20,000
066596	Additional Water Pollution Control	LS	1	x	15,000.00	=	$ 15,000
066597	Storm Water Sampling and Analysis*	LS	1	x	5,000.00	=	$ 5,000

Subtotal NPDES (Without Supplemental Work) *$ 383,819*

* Applies only to project with SWPPP's

TOTAL ENVIRONMENTAL $ 2,164,900

Section 6 TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)			Cost
86055X	Lighting & Sign Illumination	LS	1	x	250,000.00	=	$	250,000
860XXX	Signals & Lighting	LS	4	x	125,000.00	=	$	500,000
860402	Lighting (City Street)	LS	1	x	100,000.00	=	$	100,000
86XXXX	Fiber Optic Conduit System	LS		x		=	$	-
8611XX	Ramp Metering System (Location X)	LS		x		=	$	-
8611XX	Ramp Metering System (Location X)	LS		x		=	$	-
861088	Modify Ramp Metering System	LS	3	x	50,000.00	=	$	150,000
8607XX	Interconnection Facilities	LS		x		=	$	-
860703	Interconnection conduit and cable	M	900	x	100.00	=	$	90,000
860797	Electric Service (Irrigation)	LS	1	x	5,000.00	=	$	5,000
5602XX	Furnish Sign Structure	KG		x		=	$	-
5602XX	Install Sign Structure	KG		x		=	$	-
56XXXX	XXX mm CIDHC Pile (Sign Foundation)	M		x		=	$	-
860810	Inductive Loop Detectors	EA		x		=	$	-
8609XX	Traffic Monitoring Stations	LS	2	x	50,000.00	=	$	100,000
150760	Remove Sign Structure	EA		x		=	$	-
151581	Reconstruct Sign Structure	EA		x		=	$	-
152641	Modify Sign Structure	EA		x		=	$	-
860090	Maintain Existing Traffic Management System Elements During Construction	LS	1	x	10,000.00	=	$	10,000

Subtotal Traffic Electrical *$ 1,205,000*

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)			Cost
566011	Roadside Sign (One Post)	EA		x		=	$	-
566012	Roadside Sign (Two Post)	EA		x		=	$	-
560XXX	Furnish Sign Panels	M2		x		=	$	-
560XXX	Install Sign Panels	M2		x		=	$	-
560234	Overhead Sign Panel	LS	1	x	25,000.00	=	$	25,000
560238	Sign Panels	LS	1	x	18,000.00	=	$	18,000
560213	Furnish Sign structure(LW)	KG	1,750	x	19.00	=	$	33,250
560214	Install Sign structure(LW)	KG	1,750	x	19.00	=	$	33,250
560218	Furnish Sign structure(TRUSS)	KG	8,500	x	12.00	=	$	102,000
560219	Install Sign structure(TRUSS)	KG	8,500	x	12.00	=	$	102,000
561009	920mm CIDH Pile Sign foundation	M	14	x	4,000.00	=	$	56,000
561015	1524mm CIDH Pile Sign foundation	M	24	x	5,000.00	=	$	120,000
566011	Roadside Sign	LS	1	x	30,000.00	=	$	30,000
150760	Remove Sign Structure	EA	2	x	7,000.00	=	$	14,000
152320	Remove Traffic Stripe	M		x	1.20	=	$	-
150701	Remove Yellow Painted Traffic Stripe	M		x		=	$	-
150713	Remove Pavement Marking	M2		x		=	$	-
150742	Remove Roadside Sign	EA		x	250.00	=	$	-
152320	Reset Roadside Sign	EA		x	450.00	=	$	-
152394	Relocate Sign Structure	EA	1	x	1,700.00	=	$	1,700
152390	Relocate Roadside Sign	EA		x	225.00	=	$	-
82010X	Delineator (Class X)	EA		x		=	$	-
84XXXX	Permanent Pavement Delineation	LS	1	x	300,000.00	=	$	300,000
120090	Construction Area Signs	LS	1	x	10,000.00	=	$	10,000

Subtotal Traffic Signing and Striping *$ 845,200*

6C - Traffic Management Plan

Item code		Unit	Quantity		Unit Price ($)			Cost
128650	Portable Changeable Message Signs	EA	6	x	5,000.00	=	$	30,000

Subtotal Traffic Management Plan *$ 30,000*

6D - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)			Cost
129099A	Traffic Plastic Drum	EA		x		=	$	-
12016X	Channelizer	EA		x		=	$	-
120120	Type III Barricade	EA		x		=	$	-
129100	Temp. Crash Cushion Module	EA		x		=	$	-
120100	Traffic Control System	LS	1	x	300,000.00	=	$	300,000
120100	Traffic Control System	WD		x		=	$	-
839603A	Temporary Crash Cushion (ADIEM)	EA		x		=	$	-
11856A	Temporary Crash Cushion (ABSORB 350)	EA	15	x	5,000.00	=	$	75,000
129000	Temporary Railing (Type K)	M	3,200	x	35.00	=	$	112,000
120143	Temporary Pavement Delineation	M	5,000	x	6.00	=	$	30,000

Subtotal Stage Construction and Traffic Handling *$ 517,000*

TOTAL TRAFFIC ITEMS $ 2,597,200

Section 7 DETOURS*

Item code		Unit	Quantity		Unit Price ($)			Cost
190101	Roadway Excavation	M3		x		=	$	-
198050	Embankment	M3		x		=	$	-
198001	Imported Borrow	M3		x		=	$	-
390102	Asphalt Concrete (Type A)	Tonne		x		=	$	-
260201	Class 2 Aggregate Base	M3		x		=	$	-
250401	Class 4 Aggregate Subbase	M3		x		=	$	-
07XXXX	Temporary Drainage	LS		x		=	$	-
129000	Temporary Railing (Type K)	M		x		=	$	-
1286XX	Temporary Signals	EA		x		=	$	-
120143	Temporary Pavement Delineation	M		x		=	$	-
0713XX	Temporary Fence (Type X)	M		x		=	$	-

* Includes constructing, maintaining, and removal

TOTAL DETOURS $ -

Section 8 MINOR ITEMS (Use Appropriate percentage between 5%-10%)

Total of Section 1-7	15,486,300	x	5%	=	$ 774,315

TOTAL MINOR ITEMS $ 774,400

Section 9 ROADWAY MOBILIZATION*

Item code							
999990	Total Section 1-8	$	16,260,700	x	10%	=	$ 1,626,070

TOTAL MOBILIZATION $ 1,626,100

* For Project less than 50 Working Days "Mobilization" is not required as a separate contract item, however contract item prices should take into consideration mobilization as part of the price.

Note: If the building portion of the project is greater than 50% of the total project cost, then mobilization is not included.

Section 10 SUPPLEMENTAL WORK

Total Section 1-8 =	$	16,260,700	5%	=	$	813,035

Item code		Unit	Quantity		Unit Price ($)			Cost
066666	Compensation Adjustment for Price Index Fluctuations of Paving Asphalt	LS	1	x	20,000.00	=	$	20,000
066094	Value Analysis	LS	1	x	10,000.00	=	$	10,000
066090	Maintain Traffic	LS	1	x	250,000.00	=	$	250,000
066920	Dispute Review Board	LS	1	x	22,500.00	=	$	22,500
066015	Federal Trainee Program	LS	1	x	8,800.00	=	$	8,800
066700	Partnering	LS	1	x	50,000.00	=	$	50,000
066411	Clean & Seal Random Pavement Cracks	LS		x		=	$	-
066222	Locate Existing Cross-Over	LS		x		=	$	-
066169A	Additional Soil Nail Lengthening	LS	1	x	50,000.00	=	$	50,000
066904	Remove Rock & Debris	LS	1	x	15,000.00	=	$	15,000
066866	Operation of Existing Traffic Management System	LS	1	x	20,000.00	=	$	20,000
066202	Maintain Existing Plants	LS	1	x	15,000.00	=	$	15,000
066208	Repair Existing Irrigation System	LS	1	x	10,000.00	=	$	10,000
066218	Prune Existing Plants	LS	1	x	25,000.00	=	$	25,000
066222	Locate Existing Cross-Over	LS	1	x	5,000.00	=	$	5,000
066223	Maintain Water Supply	LS	1	x	2,000.00	=	$	2,000

***NPDES** Supplemental Work specified in Section 5C = $ 503,300*

TOTAL SUPPLEMENTAL WORK $ 1,316,400

Section 11 STATE FURNISHED MATERIALS

Item code		Unit	Quantity		Unit Price ($)		Cost
066105	RE Office	LS	1	x	176,000.00	=	$176,000
066063	Public Information	LS	1	x	75,000.00	=	$75,000
066901	Water Expenses	LS	1	x	15,000.00	=	$15,000
06684X	Ramp Meter Controller Assembly	LS	1	x	50,000.00	=	$50,000
06684X	TMS Controller Assembly	LS	1	x	20,000.00	=	$20,000
06684X	Traffic Signal Controller Assembly	LS	1	x	15,000.00	=	$15,000
066062A	COZEEP Expenses	LS	1	x	30,000.00	=	$30,000
066803	Padlocks	LS	1	x	300.00	=	$300
066059A	Freeway Service Patrol	LS	1	x	250,000.00	=	$250,000
066095A	Environmental (Wall Treatment)	LS	1	x	150,000.00	=	$150,000
066093A	Biological Monitoring	LS	1	x	50,000.00	=	$50,000
066097A	Landscape Monitoring Report	LS	1	x	50,000.00	=	$50,000
066901	Water Expenses	LS	1	x	50,000.00		$50,000

TOTAL STATE FURNISHED *$931,300*

Section 12 CONTINGENCY

Use appropriate percentage based on the detail of estimate. Anything other than the suggested contingency in the PDPM needs to be *justified. (Pre-PSR 30%-50%, PSR 25%, PR 20%, PAR 15%, After PAR 10%)

Total Section 1-11	$	20,134,500	x	20%	=	$4,026,900

TOTAL CONTINGENCY $4,026,900

*Justification:

Section 13 OVERHEAD

Item code		Unit	Quantity		Unit Price ($)		Cost		
							$ 66,477,800		
							$ 73,447,200	$	74,378,500
Item code		*Unit*	*Quantity*		*Unit Price ($)*		*Cost*		
070018	Time Related Overhead (TRO)	WD	500	X	13640.8	=	$3,323,900		

Note: If the building portion of the project is greater than 50% of the total project cost, then TRO is not included.

TOTAL OVERHEAD $3,323,900

II. STRUCTURES ITEMS

DATE OF ESTIMATE	00/00/00	00/00/00	00/00/00
Bridge Name	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Bridge Number	57-0786	57-0785	57C-0786
Structure Type	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Width (Meters) [out to out]	0.00 m	0.00 m	0.00 m
Total Bridge Length (Meters)	0.00 m	0.00 m	0.00 m
Total Area (Square Meters)	310.00 m^2	1261.00 m^2	750.00 m^2
Structure Depth (Meters)	0.00 m	0.00 m	0.00 m
Footing Type (pile or spread)	spread	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Cost Per Square Meters	$2,200.00	$2,350.00	$2,555.00
COST OF EACH STRUCTURE	**$682,000.00**	**$2,963,350.00**	**$1,916,250.00**

DATE OF ESTIMATE	00/00/00	00/00/00	00/00/00
Bridge Name	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Bridge Number	57C0786	5.70E-74	57C-0787
Structure Type	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Width (Meters) [out to out]	0.00 m	0.00 m	0.00 m
Total Bridge Length (Meters)	0.00 m	0.00 m	0.00 m
Total Area (Square Meters)	14557.00 m^2	7200.00 m^2	792.00 m^2
Structure Depth (Meters)	0.00 m	0.00 m	0.00 m
Footing Type (pile or spread)	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx	xxxxxxxxxxxxxxxxxx
Cost Per Square Meters	$2,300.00	$1,200.00	$3,200.00
COST OF EACH STRUCTURE	**$33,481,100.00**	**$8,640,000.00**	**$2,534,400.00**

TOTAL COST OF BRIDGES	**$0.00**
TOTAL COST OF BUILDINGS	**$0.00**
TOTAL COST OF STRUCTURES[1]	**$50,217,100.00**

Estimate Prepared By: Chung-Yuan Wen ------ Division of Structures

1-22-09
Date

III. RIGHT OF WAY

A)	A1)	Acquisition, including Excess Lands, Damages & Goodwill, Fees	$	1,000,000
	A2)	SB-1210	$	0
B)		Acquisition of Offsite Mitigation	$	0
C)	C1)	Utility Relocation (State Share)	$	1,870,000
	C2)	Potholing (Design Phase)	$	0
D)		Railroad Acquisition	$	0
E)		Clearance / Demolition	$	0
F)		Relocation Assistance	$	0
G)		Title and Escrow	$	0

R/W ESTIMATE $2,870,000.00

H)	Condemnation Settlements	0%	$	0
I)	Design Appreciation Factor (Items H & I applied to items A + B)	0%	$	0

TOTAL R/W ESTIMATE $2,870,000.00

(Excluding Item #8 - Hazardous Waste)

J) **TOTAL R/W ESTIMATE: Escalated $2,870,000.00**

K)	Utility Relocation (Construction Cost)	$	0
	RIGHT OF WAY SUPPORT	**$**	**850,000**

Support Cost Estimate Prepared By _____ Project Coordinator[1] Phone

Utility Estimate Prepared By _____ Utiliy Coordinator[2] Phone

R/W Acquistion Estimate Prepared By _____ Right of Way Estimator[3] Phone

[1] When estimate has Support Costs only [2] When estimate has Utility Relocation [3] When R/W Acquisition is required

IV. SUPPORT COST ESTIMATE SUMMARY

SB-45 CATEGORY SUPPORT COST	FY 00/01	FY 01/02	FY 02/03	FY 03/04	FY 04/05	FY 05/06	FY 06/07	FY 07/08	FY 08/09	P3 Subtotal
PR/ED (PD,PE,PM)									1,500,000	1,500,000
PS&E (PS)									6,800,000	6,800,000
R/W (RW)										0
CONSTRUCTION (CM)									5,000,000	5,000,000
Total Support Cost:	0	0	0	0	0	0	0	0	########	

SB-45 CATEGORY SUPPORT COST	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	P3 Total	Support Ratio
PR/ED (PD,PE,PM)										1,500,000	2%
PS&E (PS)										6,800,000	8%
R/W (RW)	850,000									850,000	1%
CONSTRUCTION (CM)	5,300,000									10,300,000	12%
Total Support Cost:	7,189,394	0	0	0	0	0	0	0	0	#########	

NOTE: ESCALTED COSTS ARE FILLED IN AUTOMATICALLY ON PAGE 1.
DO NOT ENTER ESCALATED COSTS ON THIS PAGE.

Total Capital Cost:	**$82,523,000**
Overall Percent Support Cost:	**24%**

Approved by: _____ Project Control Engineer _____ Date

Attachment E
Typical Cross Sections

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

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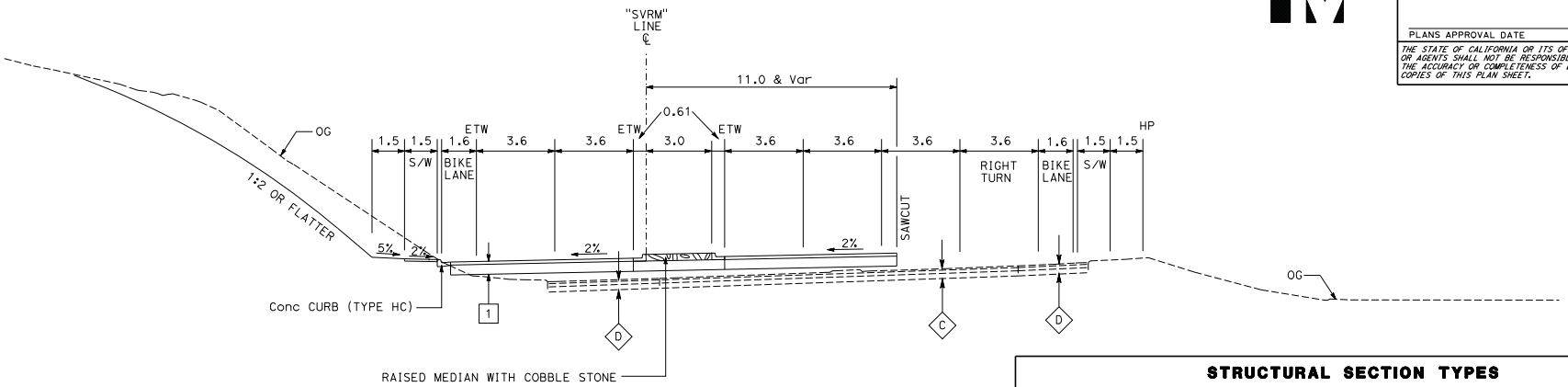
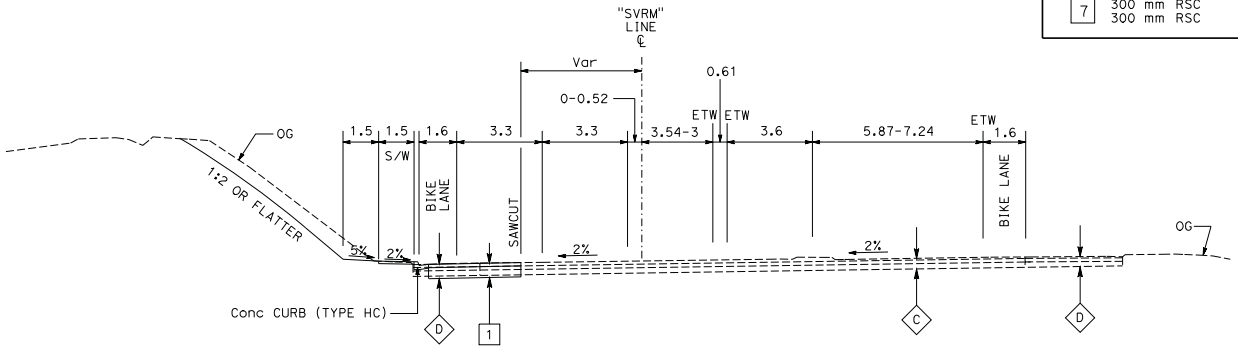


"SVRM" LINE

Sta 441+71 TO 442+16
SEE CONSTRUCTION DETAILS

STRUCTURAL SECTION TYPES					
1	140 mm HMA-A 460 mm CL2-AB	CITY ST / BUSINESS ACCESS	4	150 mm HMA-A 450 mm CL2-AB	I-805 OUTSIDE SHOULDERS
2	240 mm JPCP 120 mm HMA-A 165 mm CL2-AB	I-805 MEDIAN HOV LANES/ DAR	5	180 mm HMA-A 615 mm CL2-AB	RAMP TRAVELED WAY
3	300 mm JPCP 150 mm HMA-A 195 mm CL2-AB	I-805 OUTSIDE LANES	6	135 mm HMA-A 300 mm CL2-AB	RAMP SHOULDER > 1.5 m
7	300 mm RSC 300 mm RSC	I-805 OUTSIDE LANES			



"SVRM" LINE

Sta 440+77.702 TO 441+14.264
SEE CONSTRUCTION DETAILS

EXISTING STRUCTURAL SECTIONS			
A	198 mm PCC 137 mm CTB 152 mm AS	E	91 mm AC 137 mm AB 265 mm - 168 mm AS
B	76 mm AC 137 mm AB 256mm - 116 mm AS	F	213 mm PCC 137 mm CTB 152 mm AS
C	76 mm AC 152 mm CTB 229 mm AS	G	91 mm AC 198 mm CTB 366 mm AS
D	76 mm AC 152 mm CTB Var AS	H	91 mm AC 198 mm CTB 366 mm - Var AS

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NO SCALE

TYPICAL CROSS SECTIONS

X-1

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Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

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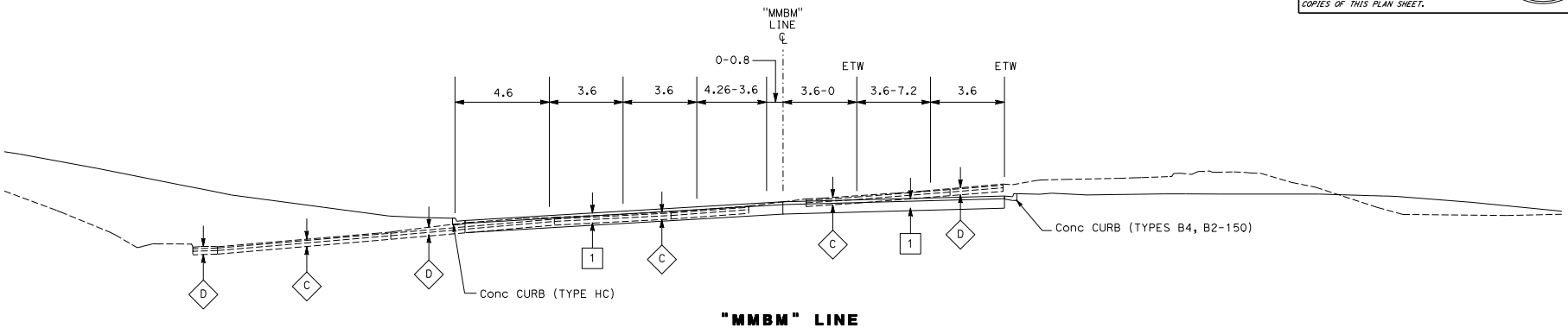
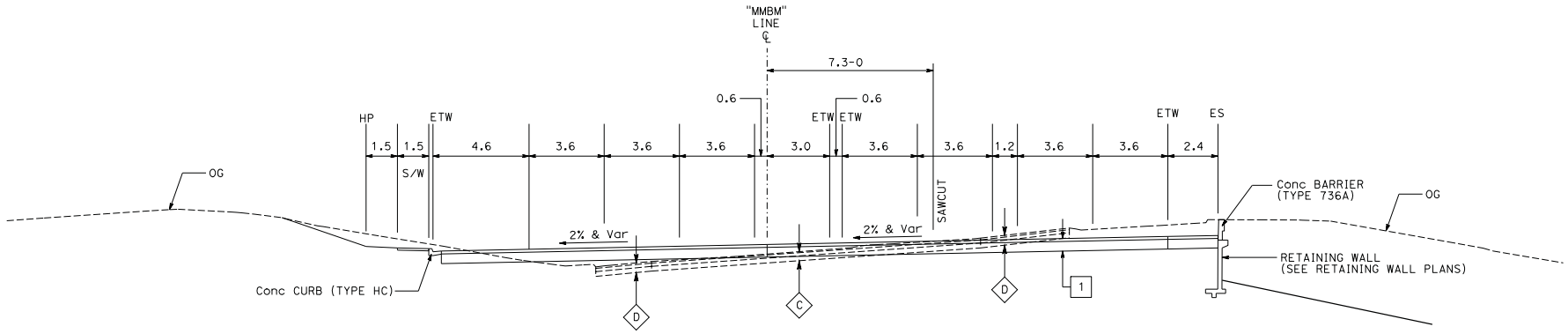


"MMBM" LINE

Sta 444+13.082 TO 444+66.133
SEE CONSTRUCTION DETAILS



"MMBM" LINE

Sta 443+13.728 TO 443+77.484
SEE CONSTRUCTION DETAILS

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TYPICAL CROSS SECTIONS

NO SCALE

X-2

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EA 2T0401

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11	SD	805	R42.6/R46.2	XX	XXX

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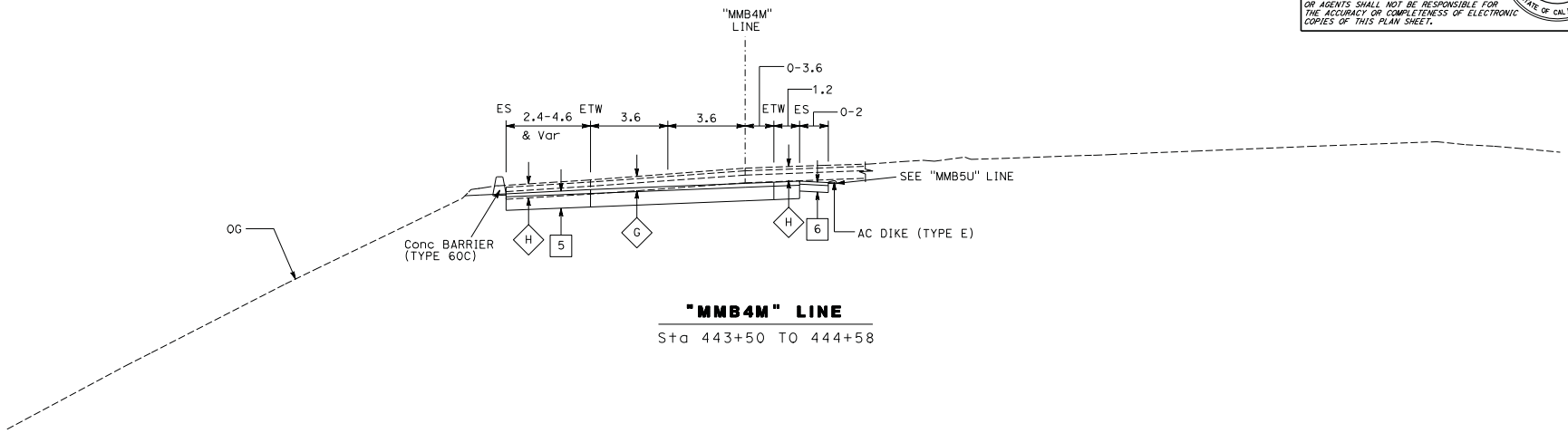
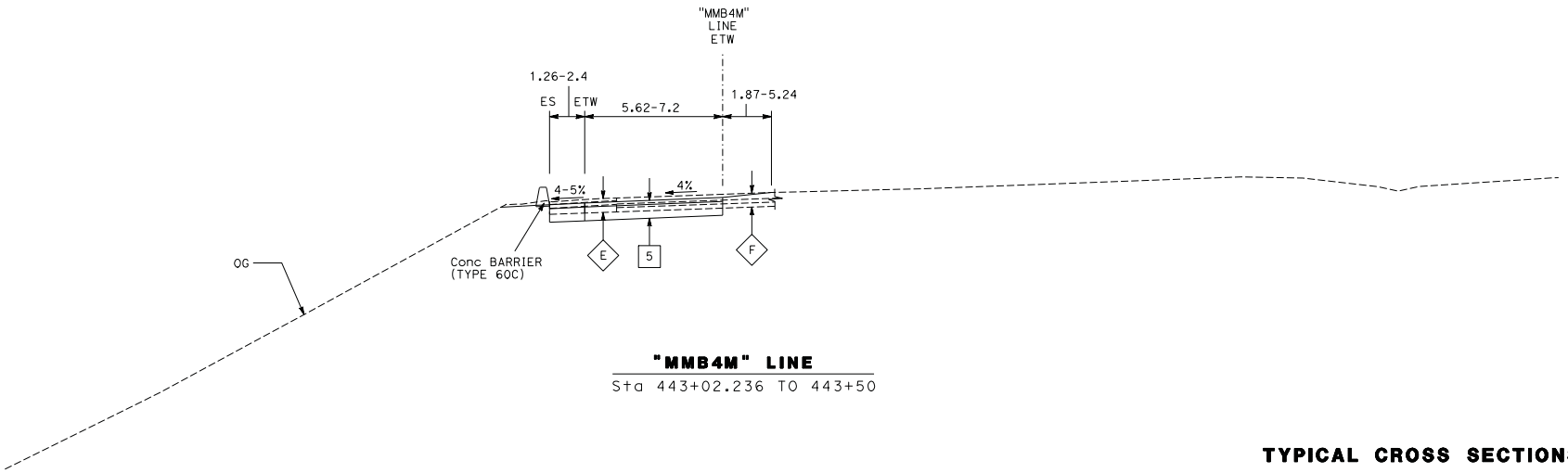


"MMB4M" LINE

Sta 443+50 TO 444+58



"MMB4M" LINE

Sta 443+02.236 TO 443+50

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NO SCALE

TYPICAL CROSS SECTIONS

X-3

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Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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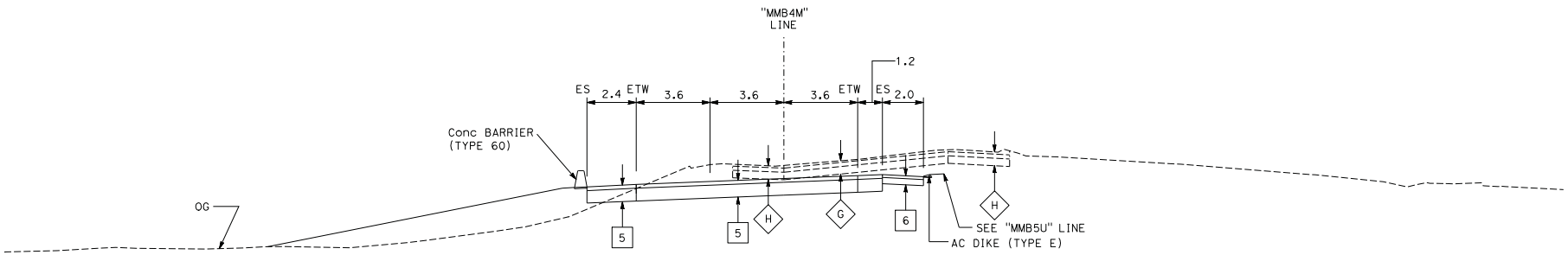

"MMB4M" LINE

Sta 444+58 TO 445+89.123

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TYPICAL CROSS SECTIONS

X-4

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DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	3	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER S.A. ALVI No. C 55293 Exp. 12-31-08 CIVIL STATE OF CALIFORNIA

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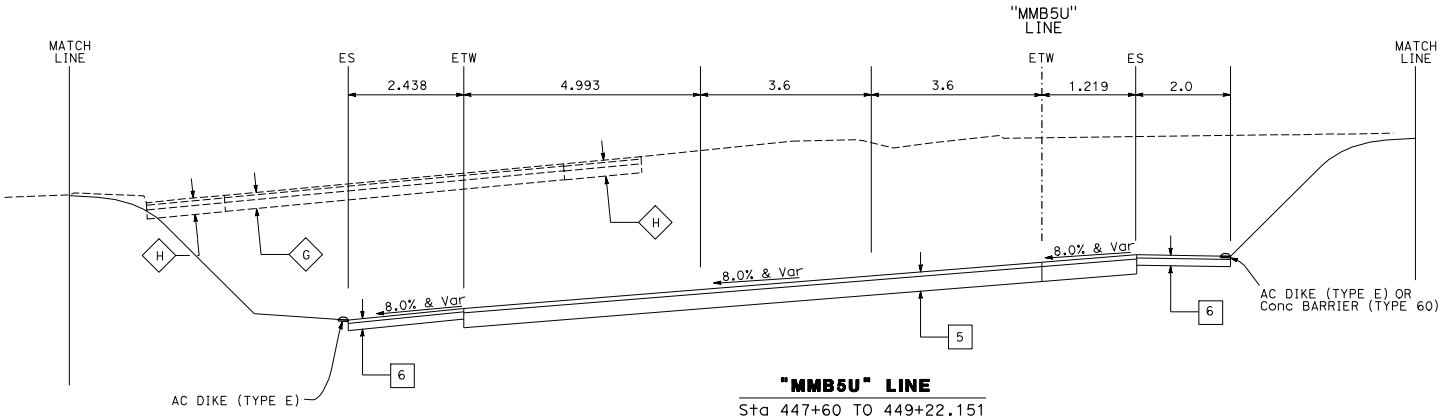
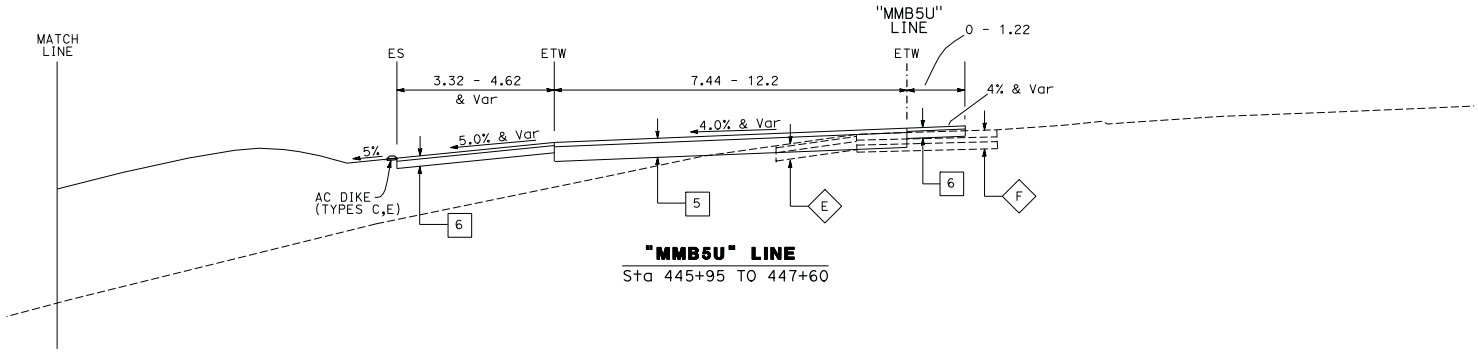


"MMB5U" LINE

Sta 447+60 TO 449+22.151



"MMB5U" LINE

Sta 445+95 TO 447+60

TYPICAL CROSS SECTIONS

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NO SCALE

X-5

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PROJECT ENGINEER **S. A. ALVI**

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DATE REVISED

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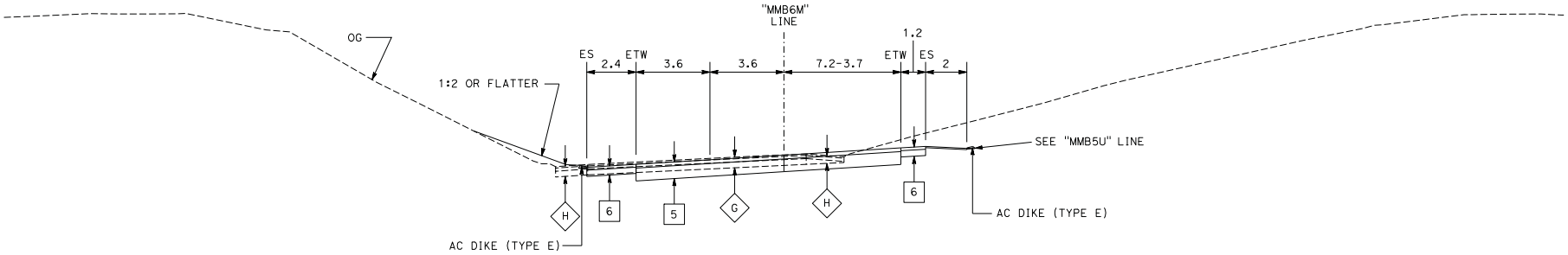
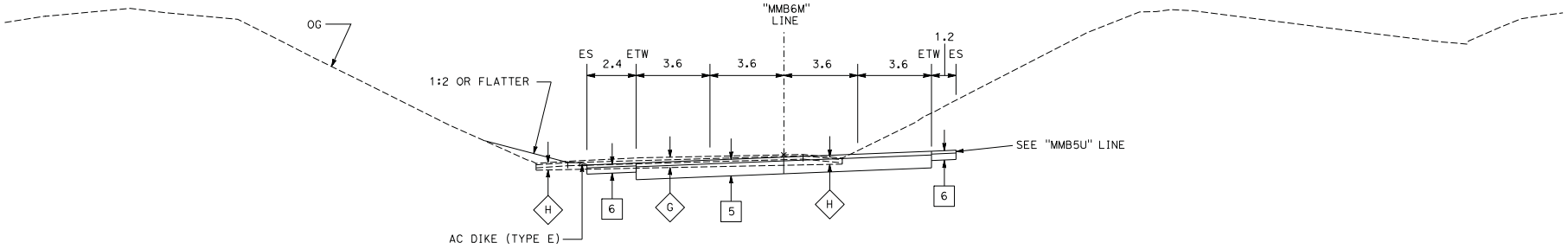


"MMB6M" LINE

Sta 447+85 TO 448+20



"MMB6M" LINE

Sta 447+35.832 TO 447+85

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

TYPICAL CROSS SECTIONS

NO SCALE

X-6

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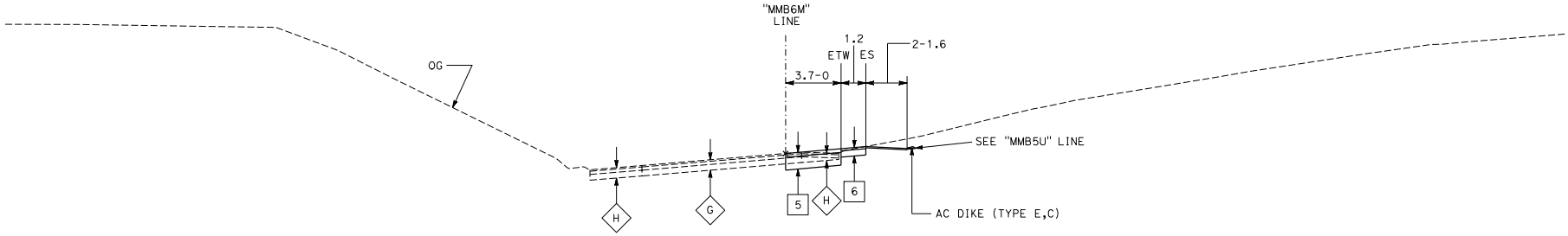

"MMB6M" LINE

Sta 448+20 TO 448+59.407

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NO SCALE

TYPICAL CROSS SECTIONS

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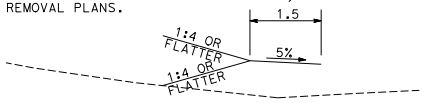
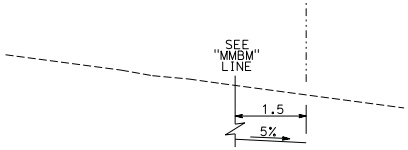
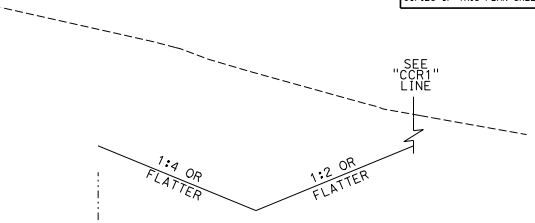


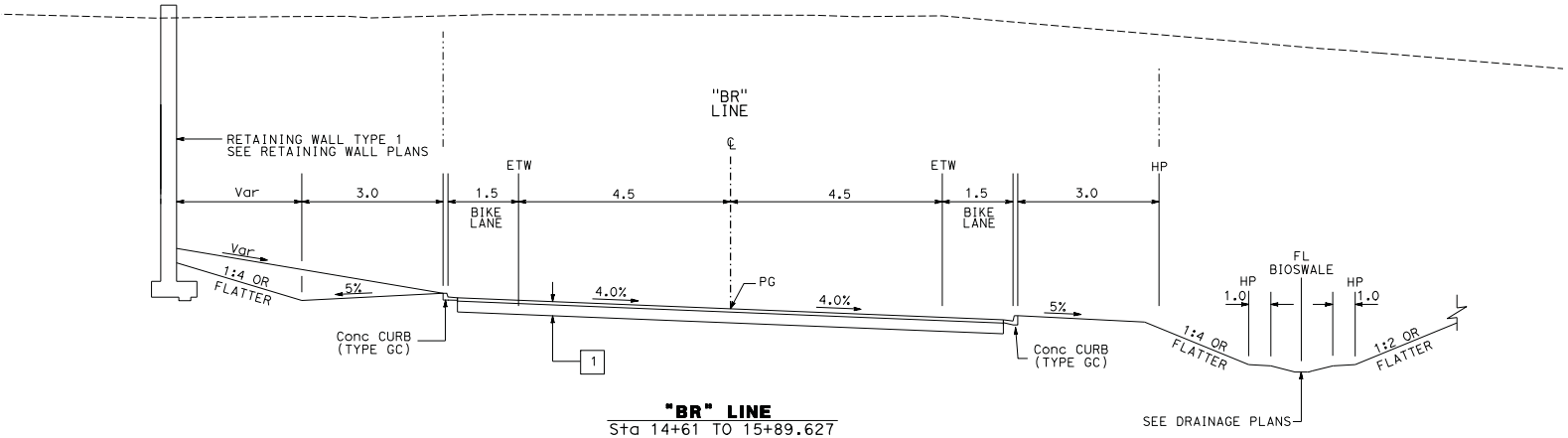
Sta 15+41 TO 16+00



Sta 15+26 TO 15+41

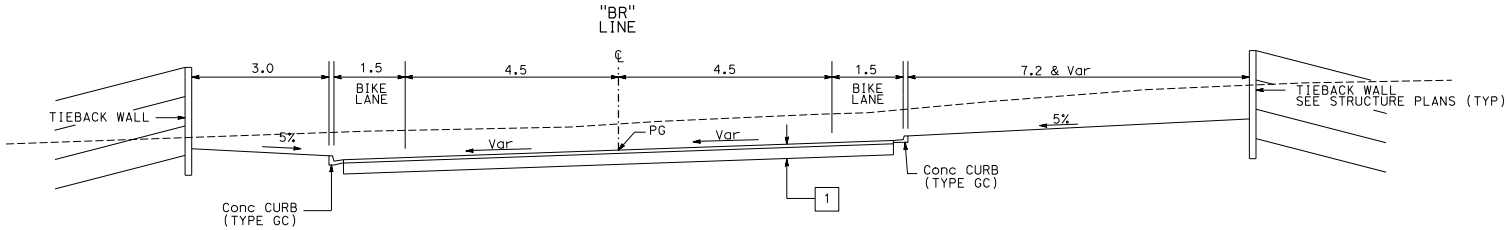


Sta 15+20 TO 16+00



"BR" LINE

Sta 14+61 TO 15+89.627



"BR" LINE

Sta 14+21 TO 14+48

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

NO SCALE

TYPICAL CROSS SECTIONS

X-8

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Caltrans

LAST REVISION 01-12-09

DATE PLOTTED => 13-JAN-2009
TIME PLOTTED => 16:16

BORDER LAST REVISED 3/1/2007

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => s126991
DGN FILE => b2T0401ca008.dgn

CU 11275

EA 2T0401

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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Caltrans Metric

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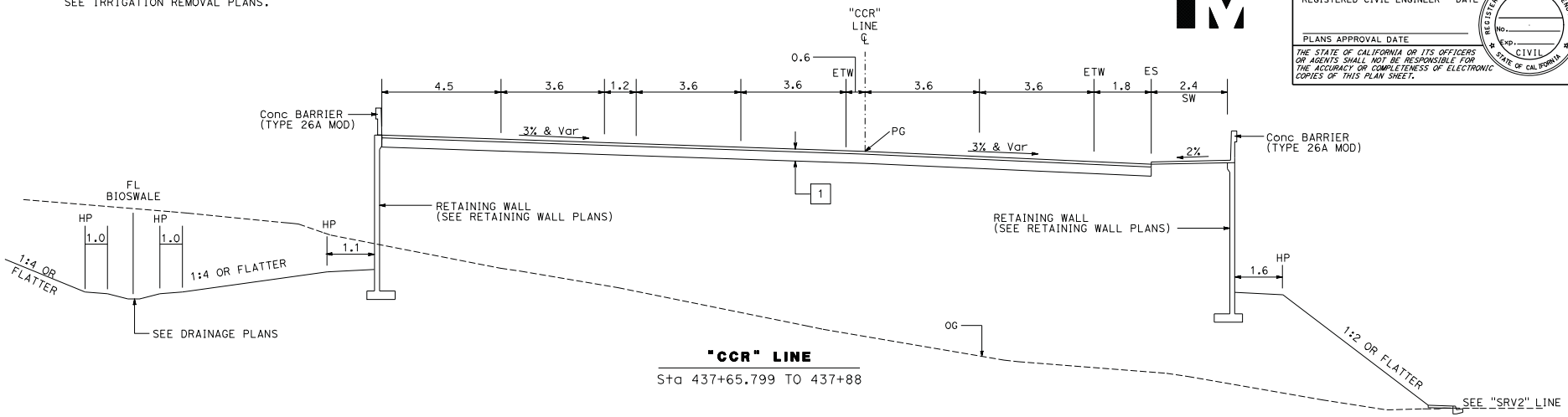
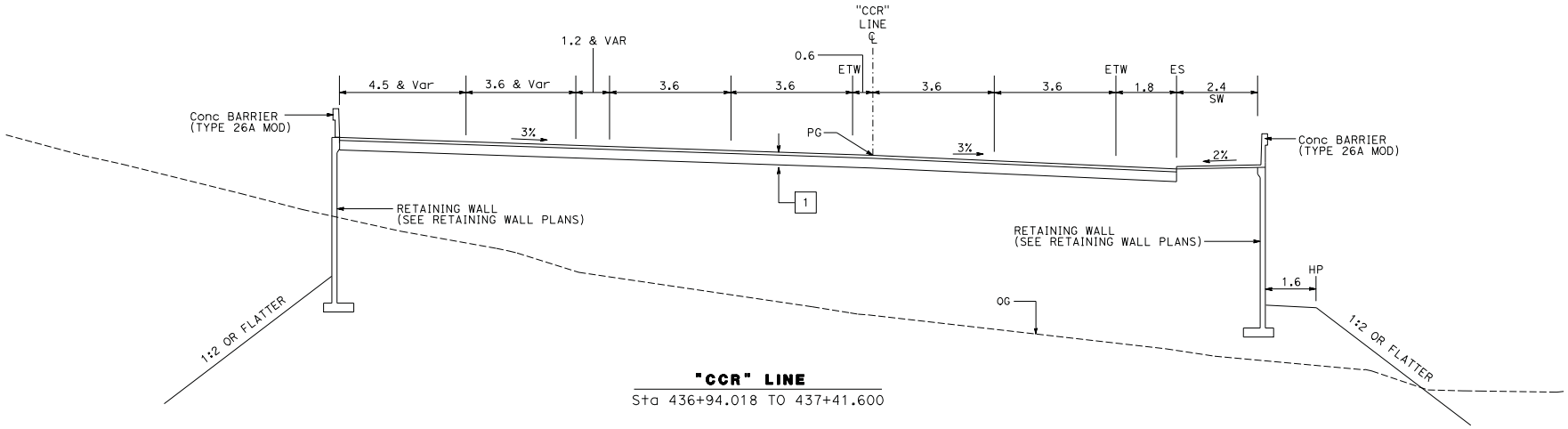
2. FOR LOCATION OF TEMPORARY IRRIGATION SUPPLY LINE, SEE IRRIGATION REMOVAL PLANS.



"CCR" LINE

Sta 437+65.799 TO 437+88



"CCR" LINE

Sta 436+94.018 TO 437+41.600

TYPICAL CROSS SECTIONS

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

NO SCALE

X-9

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LAST REVISION 01-12-09

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BORDER LAST REVISED 3/1/2007

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => s126991
DGN FILE => b2T0401ca009.dgn

CU 11275

EA 2T0401

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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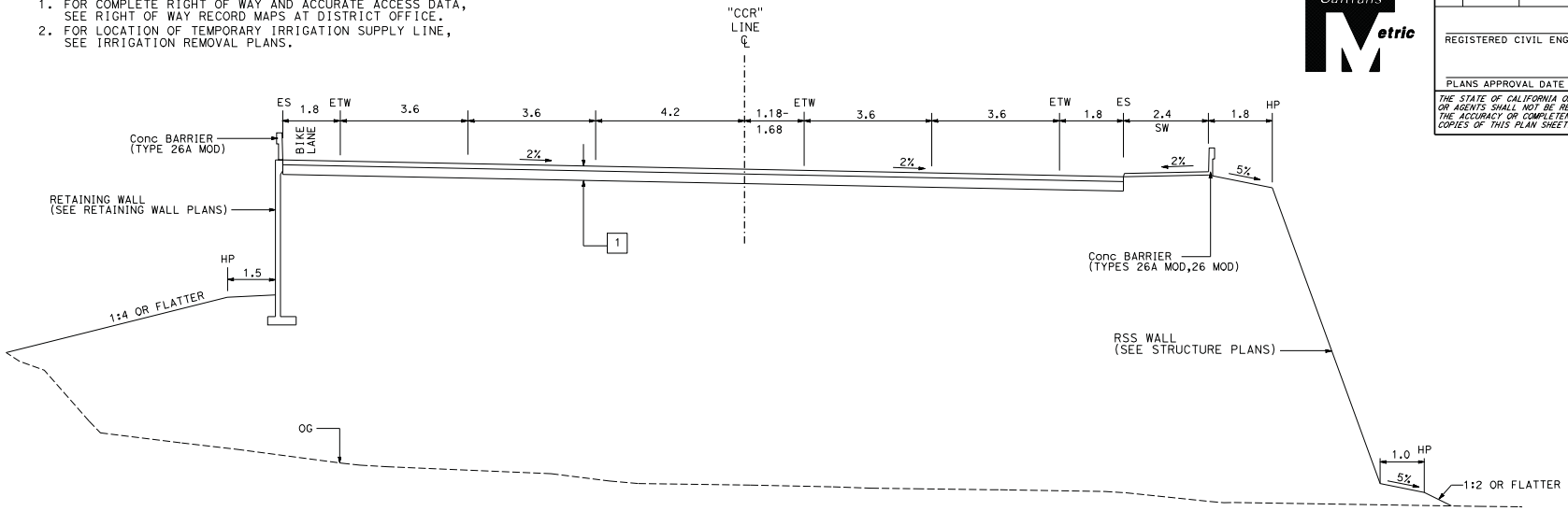
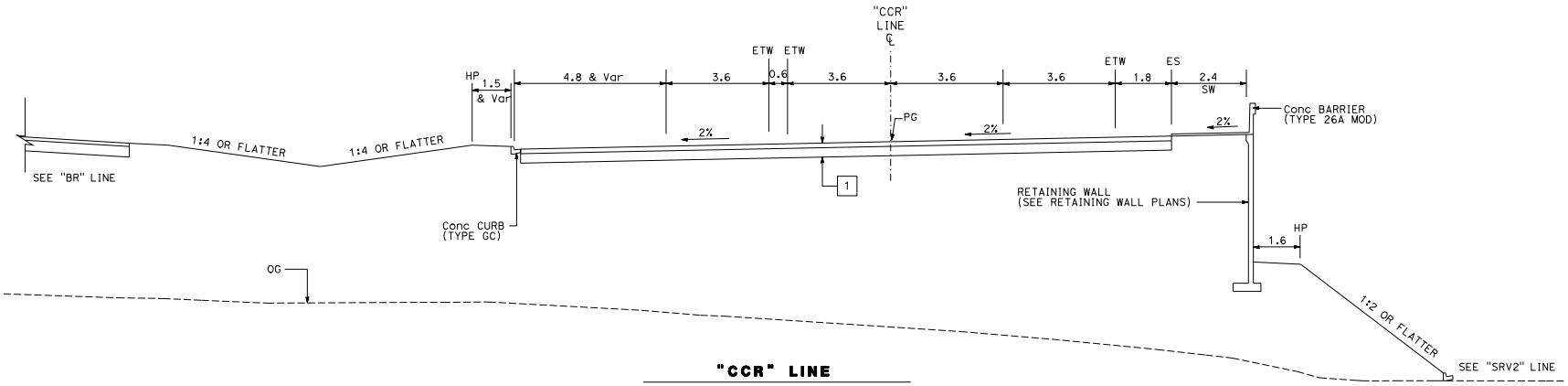
2. FOR LOCATION OF TEMPORARY IRRIGATION SUPPLY LINE, SEE IRRIGATION REMOVAL PLANS.



"CCR" LINE

Sta 443+82.600 TO 443+94.580



"CCR" LINE

Sta 438+15.203 TO 438+53.029

TYPICAL CROSS SECTIONS

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

NO SCALE

X-10

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Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

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PLANS APPROVAL DATE

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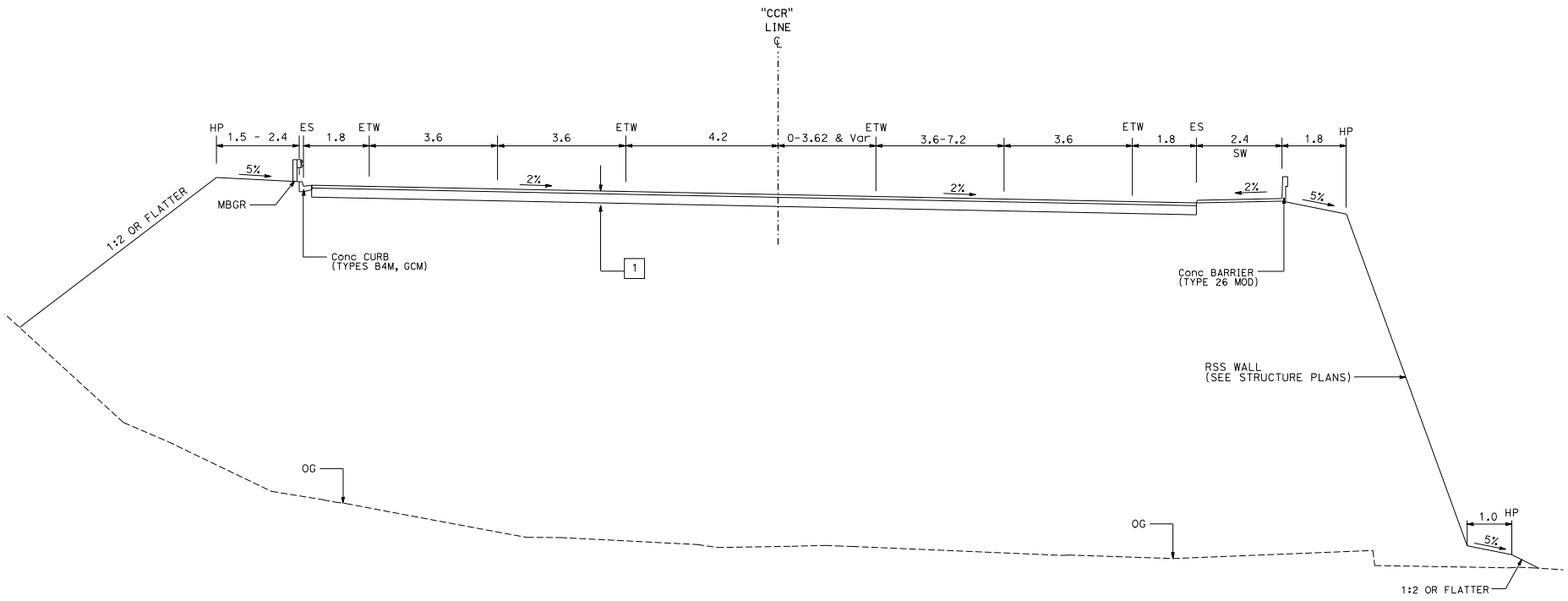

"CCR" LINE

Sta 443+94.434 TO 444+60

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

NO SCALE

TYPICAL CROSS SECTIONS

X-11

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Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

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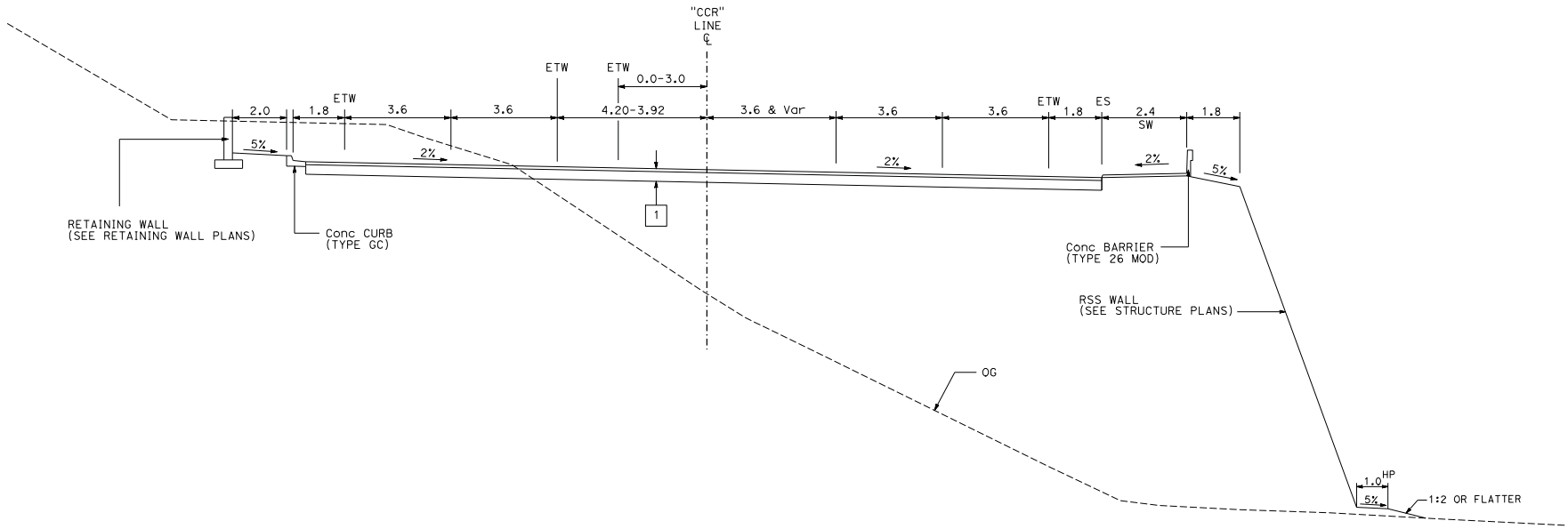

"CCR" LINE

Sta 444+60 TO 445+00

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

NO SCALE

TYPICAL CROSS SECTIONS

X-12

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USERNAME => s126991
DGN FILE => b2T0401ca012.dgn

CU 11275

EA 2T0401

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

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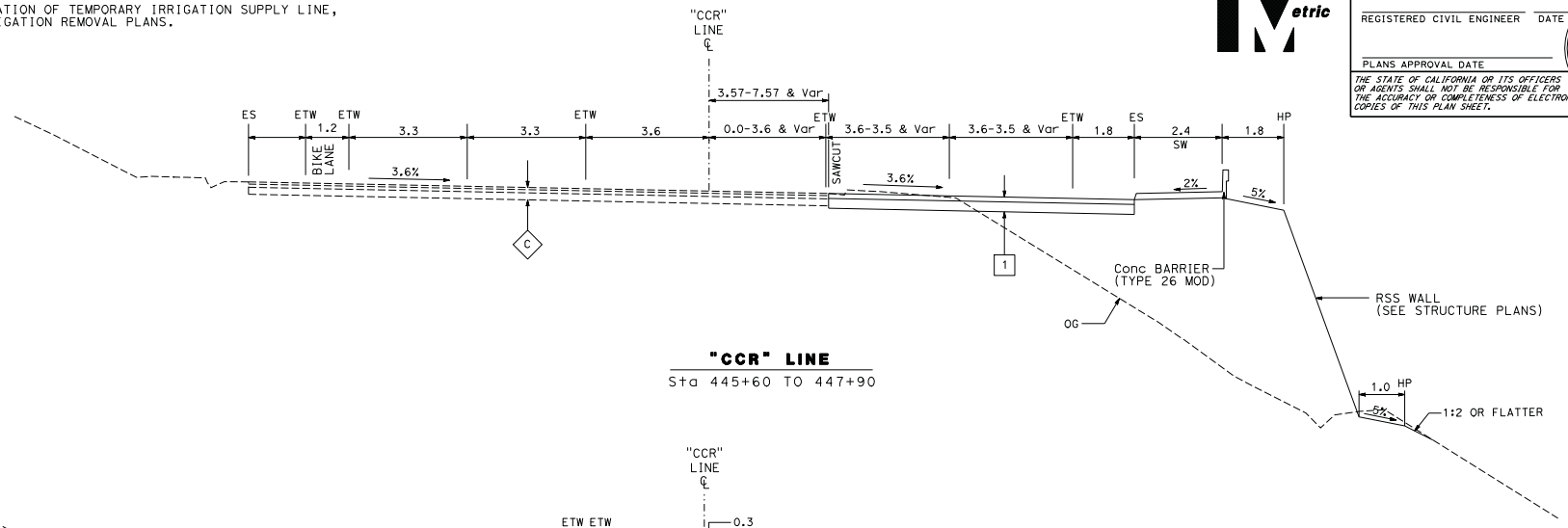
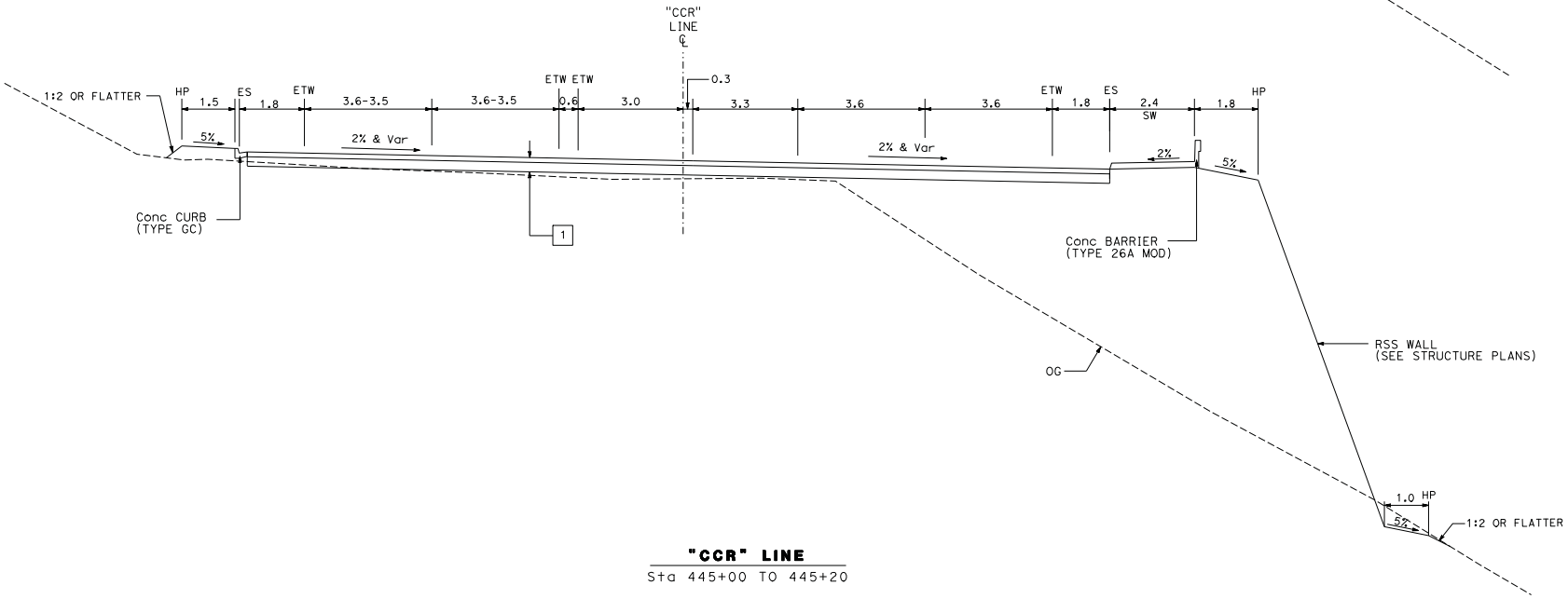


"CCR" LINE

Sta 445+60 TO 447+90



"CCR" LINE

Sta 445+00 TO 445+20

TYPICAL CROSS SECTIONS

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

NO SCALE

X-13

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Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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Caltrans Metric

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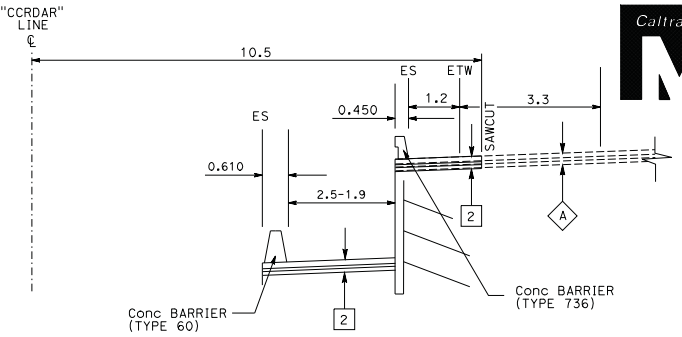
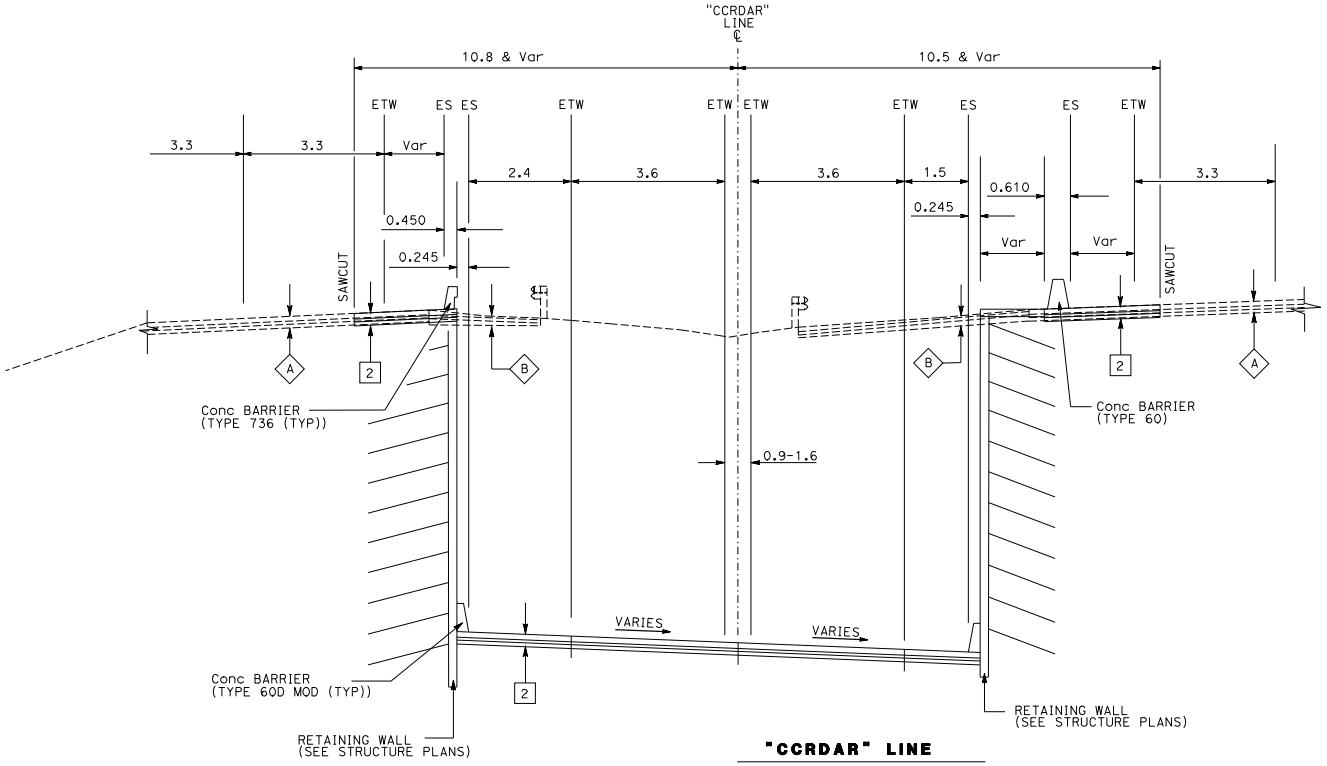
2. FOR LOCATION OF TEMPORARY IRRIGATION SUPPLY LINE, SEE IRRIGATION REMOVAL PLANS.



Sta 442+81.835 TO 443+00



"CCRDAR" LINE

Sta 442+44.161 TO 443+00

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

NO SCALE

TYPICAL CROSS SECTIONS

X-14

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

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LAST REVISION 01-12-09

DATE PLOTTED => 13-JAN-2009

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RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => s126991

DGN FILE => b2T0401ca014.dgn

CU 11275

EA 2T0401

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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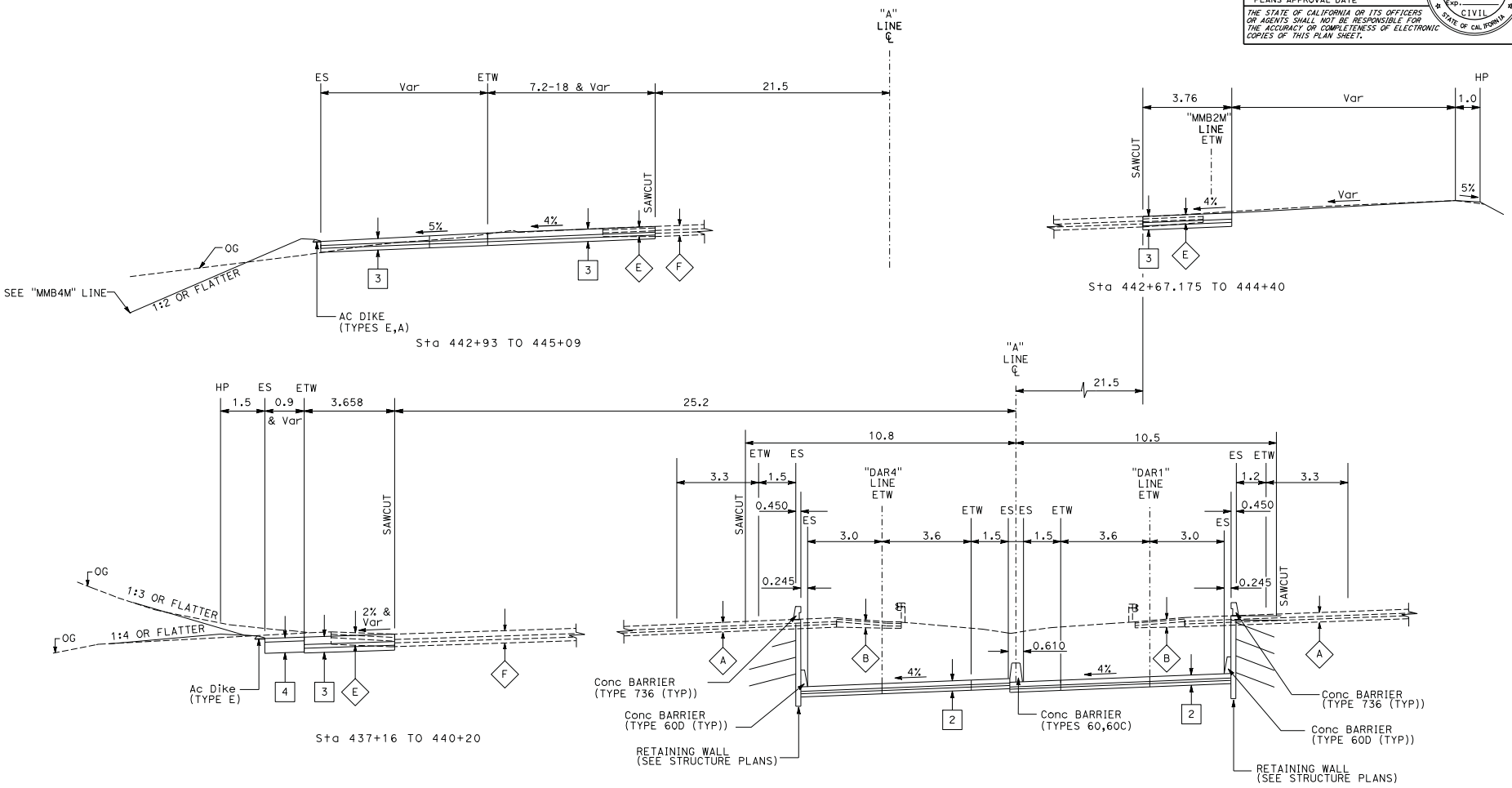
2. FOR LOCATION OF TEMPORARY IRRIGATION SUPPLY LINE, SEE IRRIGATION REMOVAL PLANS.



TYPICAL CROSS SECTIONS

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

NO SCALE

X-15

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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DATE REVISED

LAST REVISION 01-12-09

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USERNAME => s126991

DGN FILE => b2T0401ca015.dgn

CU 11275

EA 2T0401

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

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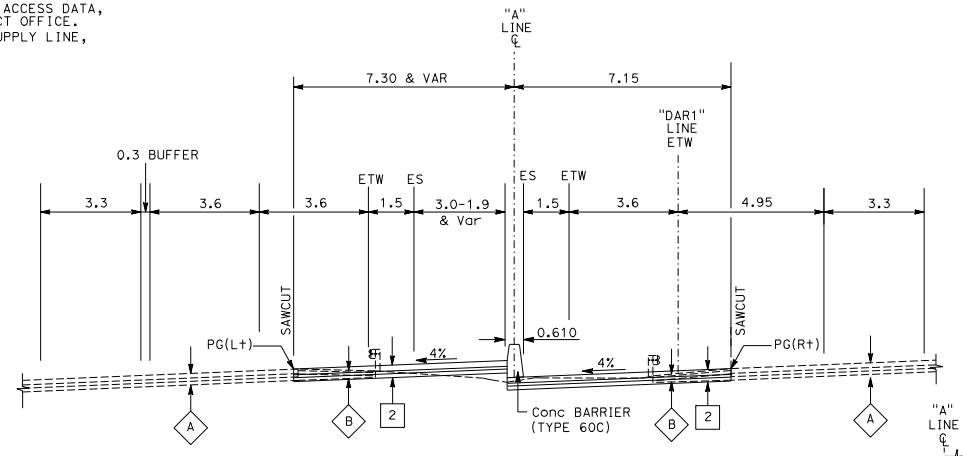
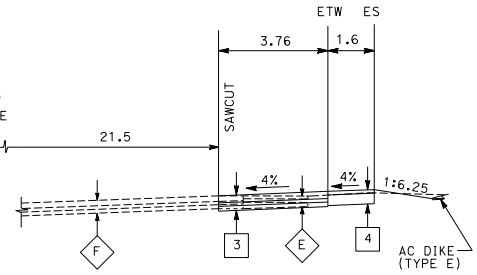
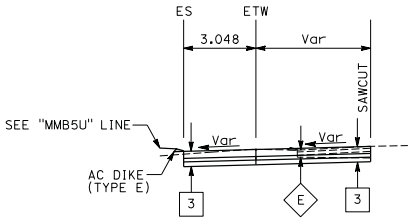


"A" LINE

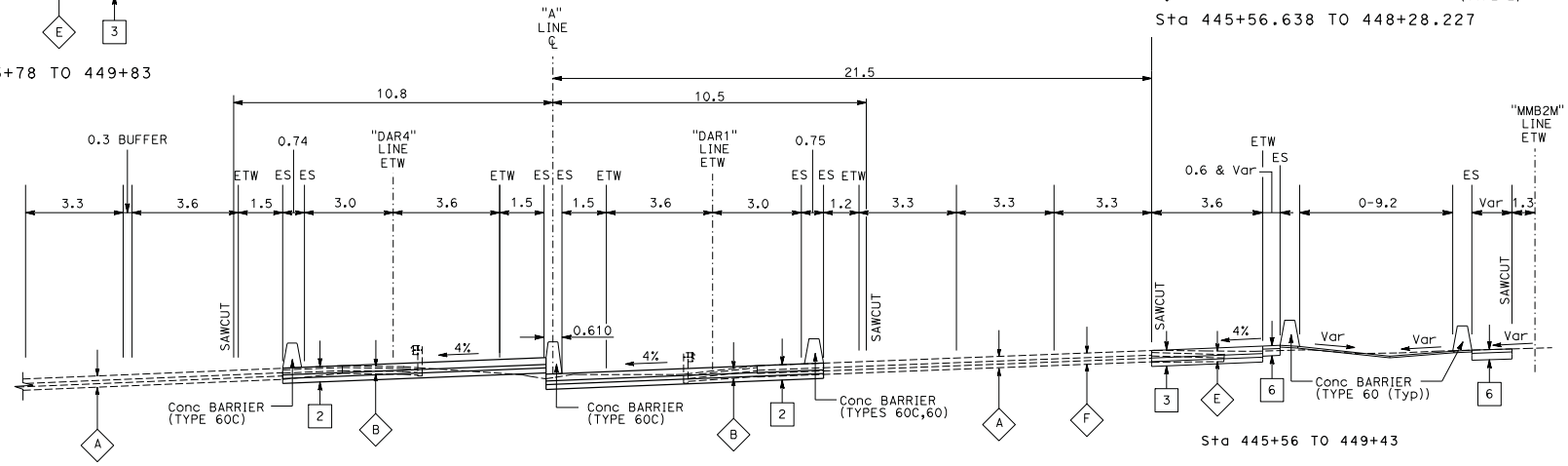
Sta 446+60 TO 448+20



Sta 445+56.638 TO 448+28.227



Sta 445+78 TO 449+83



Sta 445+56 TO 449+43

"A" LINE

Sta 444+40 TO 445+00

TYPICAL CROSS SECTIONS

X-16

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NO SCALE

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RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => s126991

DGN FILE => b2T0401ca016.dgn

CU 11275

EA 2T0401

NOTES:

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Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

Caltrans Metric

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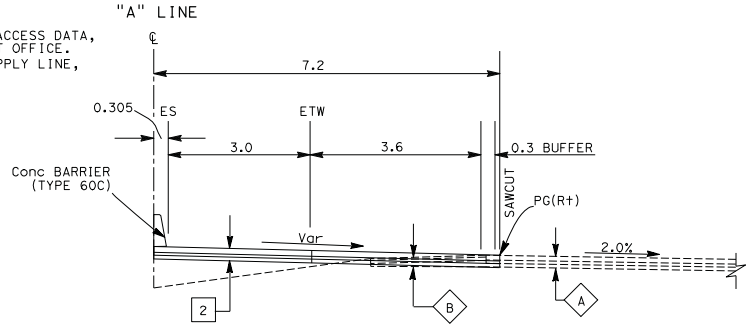
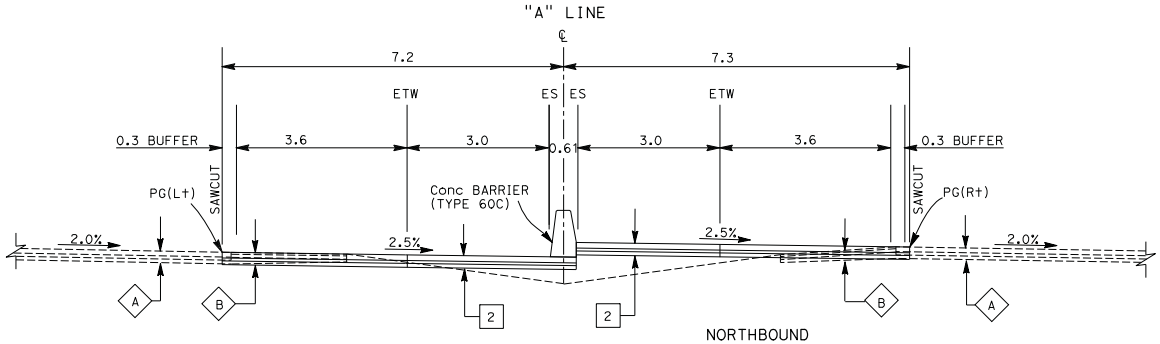
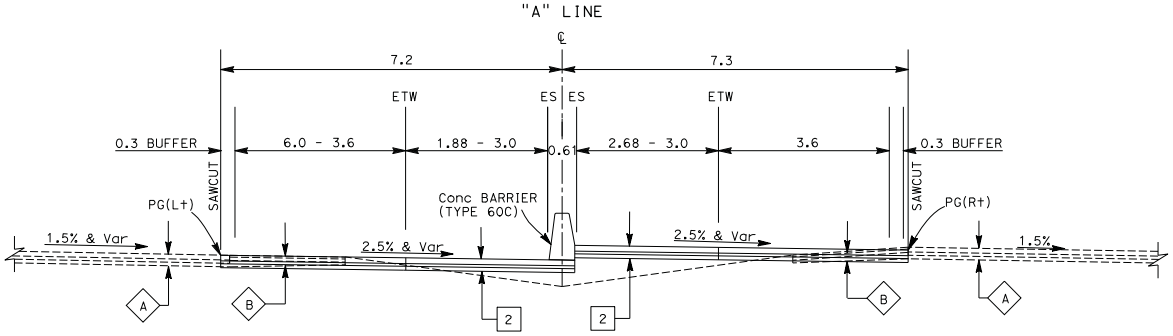


"A" LINE
Sta 457+65.603 TO 458+40



NORTHBOUND
Sta 450+35 TO 457+50

"A" LINE
Sta 450+35 TO 458+40



"A" LINE
Sta 449+85 TO 450+35

TYPICAL CROSS SECTIONS

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

NO SCALE

X-17

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Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

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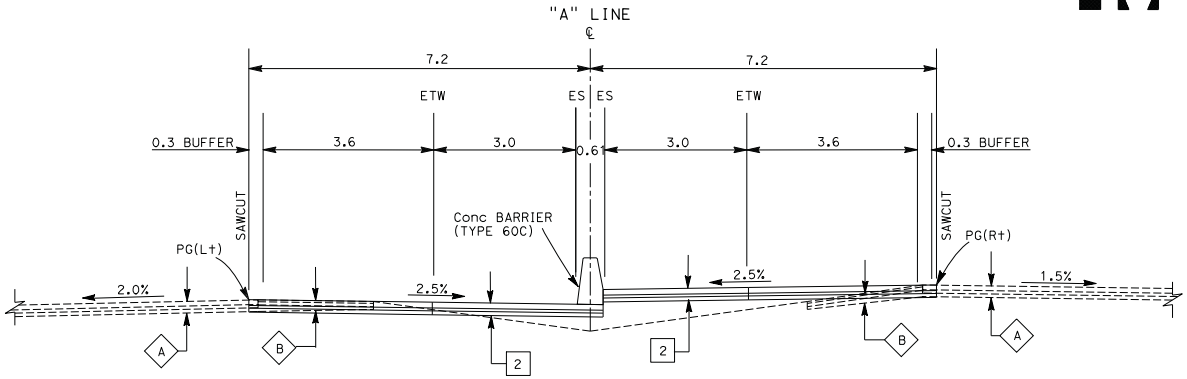
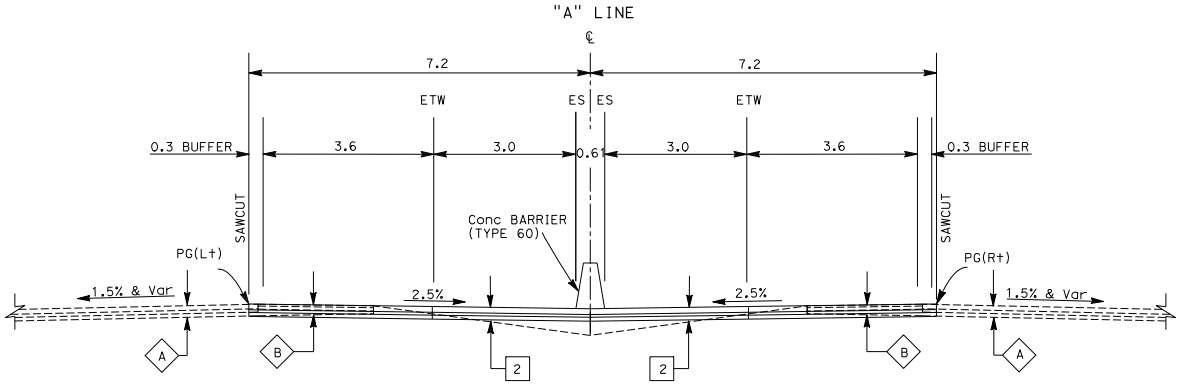


"A" LINE

Sta 461+80 TO 463+00



"A" LINE

Sta 458+40 TO 461+80

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

NO SCALE

TYPICAL CROSS SECTIONS

X-18

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11	SD	805	R42.6/R46.2	XX	XXX

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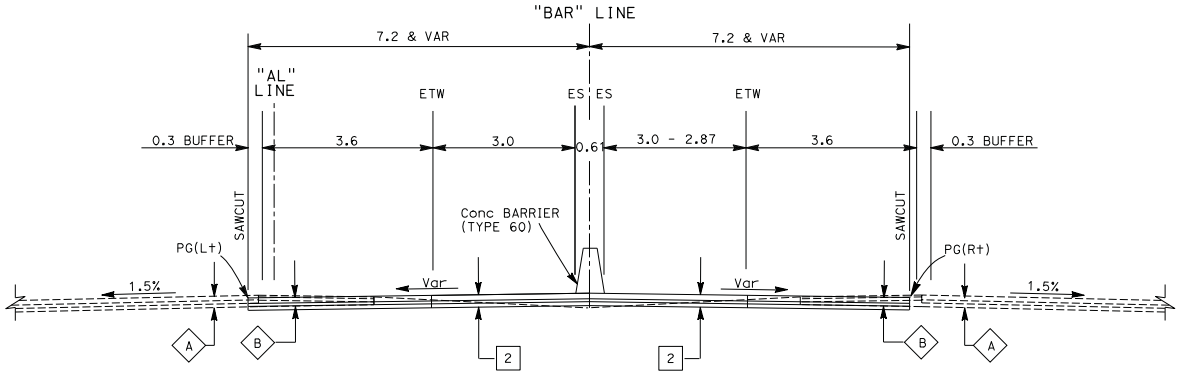
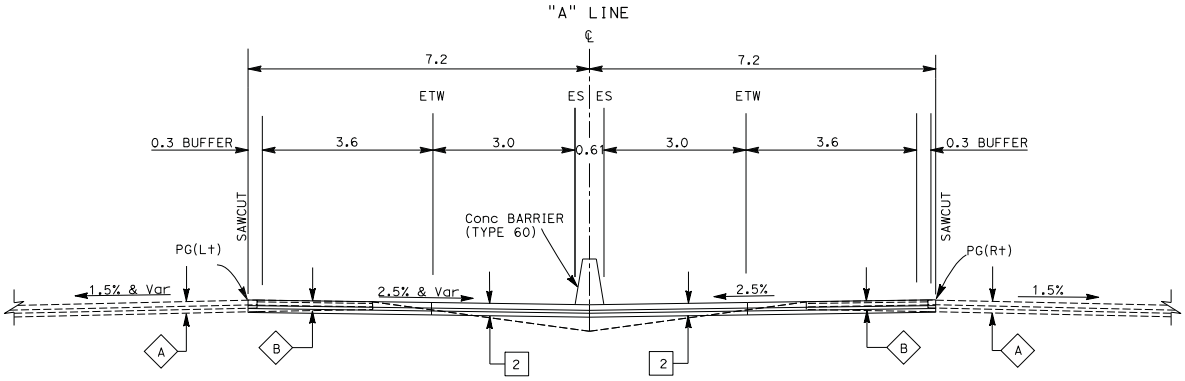


"BAR" LINE
Sta 463+65 TO 464+90



"A" LINE
Sta 463+00 TO 463+65

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

NO SCALE

TYPICAL CROSS SECTIONS

X-19

REVISED BY	DATE REVISED

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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION 01-12-09 DATE PLOTTED => 13-JAN-2009 TIME PLOTTED => 16:18

BORDER LAST REVISED 3/1/2007

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => s126991
DGN FILE => b2T0401ca019.dgn

CU 11275

EA 2T0401

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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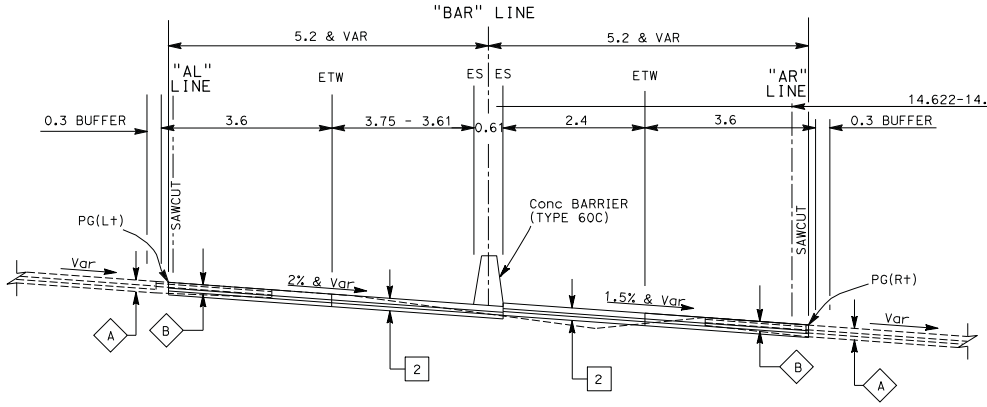
REGISTERED PROFESSIONAL ENGINEER NO. EXP. CIVIL STATE OF CALIFORNIA

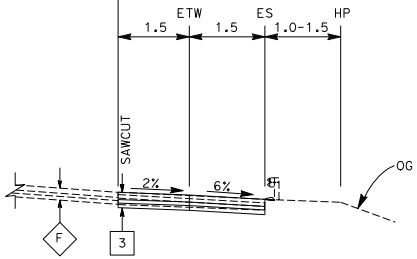
Caltrans Metric

NOTES:

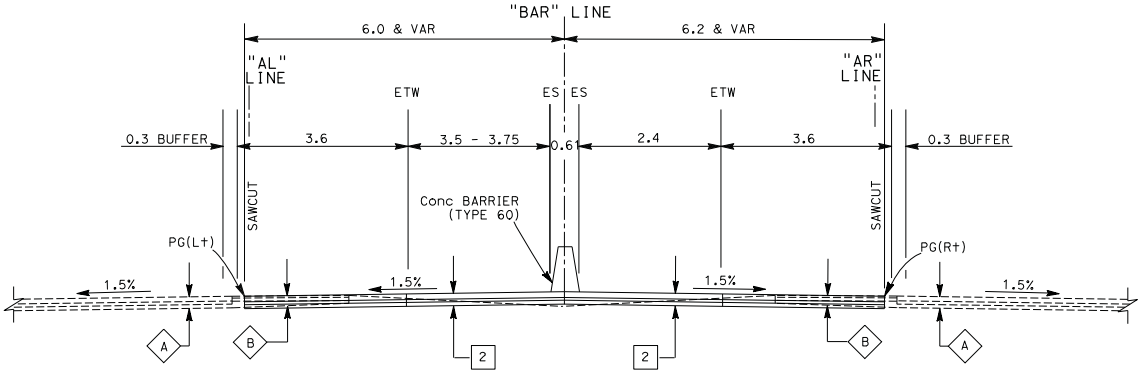
1. FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.
2. FOR LOCATION OF TEMPORARY IRRIGATION SUPPLY LINE, SEE IRRIGATION REMOVAL PLANS.



"BAR" LINE
Sta 466+40 TO 467+30



Sta 466+00 TO 467+74.326



"BAR" LINE
Sta 465+32 TO 466+40

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

TYPICAL CROSS SECTIONS

NO SCALE

X-20

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

FUNCTIONAL SUPERVISOR

CALCULATED-DESIGNED BY

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REVISED BY

DATE REVISED

LAST REVISION 01-12-09

DATE PLOTTED => 13-JAN-2009
TIME PLOTTED => 16:18

BORDER LAST REVISED 3/1/2007

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => s126991
DGN FILE => b2T0401ca020.dgn

CU 11275

EA 2T0401

Attachment F
Project Layout Sheets

District	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER NO. EXP. CIVIL STATE OF CALIFORNIA

Caltrans Metric

NOTES:

1. FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.
2. FOR LOCATION OF TEMPORARY IRRIGATION SUPPLY LINE, SEE IRRIGATION REMOVAL PLANS.
3. Hor. DATUM: NAD83 (Hpgn)
   Vert. DATUM: NGVD29

CURVE DATA

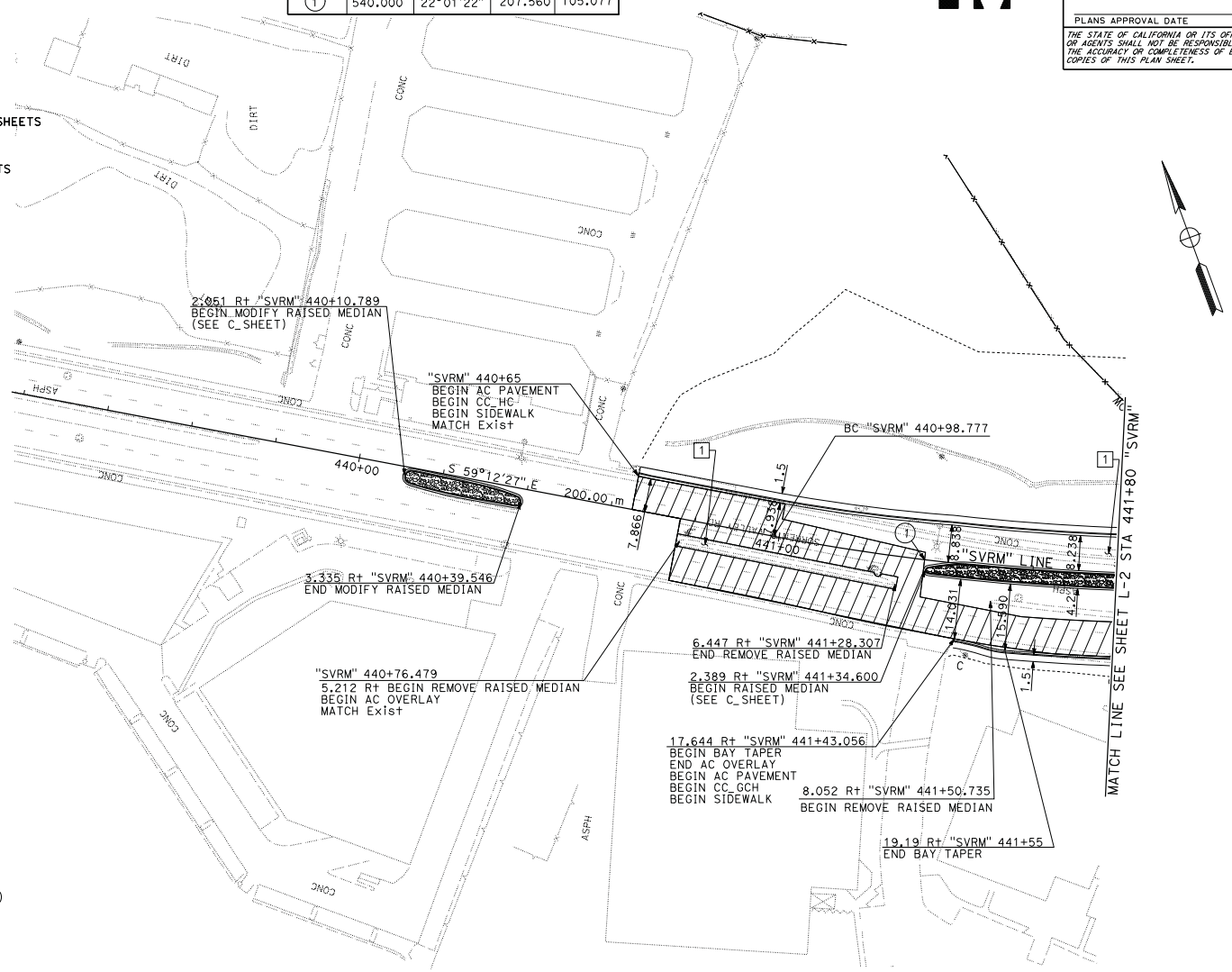
No.	R	Δ	L	T
1	540.000	22°01'22"	207.560	105.077

LEGEND:

- CURVE DATA NUMBER
- MBGR (SEE SUMMARY OF QUANTITY SHEETS FOR DETAILS)
- STRUCTURAL SECTION SEE TYPICAL CROSS SECTION SHEETS FOR STRUCTURAL SECTION TYPES
- ROCK MULCH
- ROCK BLANKET
- REMOVE BASE AND SURFACING
- COLD PLANE AC PAVEMENT 45 mm AC (TYPE A)
- MINOR CONCRETE (TEXTURED PAVING) (GORE PAVING) SEE Const DETAIL PLAN SHEETS
- ENVIRONMENTALLY SENSITIVE AREA
- XXX RIGHT OF WAY PARCEL NUMBER
- RIGHT OF WAY
- Exist Irr CROSSOVER

ABBREVATIONS:

ETW	- EDGE OF TRAVELED WAY
ES	- EDGE OF SHOULDER
I/C	- IRRIGATION CROSSOVER
AI/C	- ABANDON IRRIGATION CROSSOVER
ACOSD	- AC OVERSIDE DRAIN
B&S	- BASE & SURFACING
C	- CUT
CHP	- CALIFORNIA HIGHWAY PATROL
ESA	- ENVIRONMENTALLY SENSITIVE AREA
F	- FILL
MVP	- MAINTENANCE VEHICLE PULLOUT
RET	- RETAINING
ACD_xx	- AC DIKE_TYPE
CC_xx	- CONCRETE CURB_TYPE
CBAR_xx	- CONCRETE BARRIER_TYPE
MBGR	- METAL BEAM GUARD RAILING
HSSD	- HIGH SIDE SUPER DITCH
C_SHEET	- CONSTRUCTION DETAIL SHEET
STBB	- SINGLE THRIE BEAM BARRIER
DTBB	- DOULBLE THRIE BEAM BARRIER
MC(TP)	- MINOR CONCRETE (TEXTURED PAVING)
ROW	- RIGHT OF WAY



ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE 1:500

LAYOUT
L-1

LAST REVISION 01-12-09 DATE PLOTTED => 13-JAN-2009 TIME PLOTTED => 17:37

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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

BORDER LAST REVISED 3/1/2007 | RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80 | USERNAME => s126991 DGN FILE => b2T0401ea001.dgn | CU 11275 | EA 2T0401

DIst	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER NO. EXP. CIVIL STATE OF CALIFORNIA

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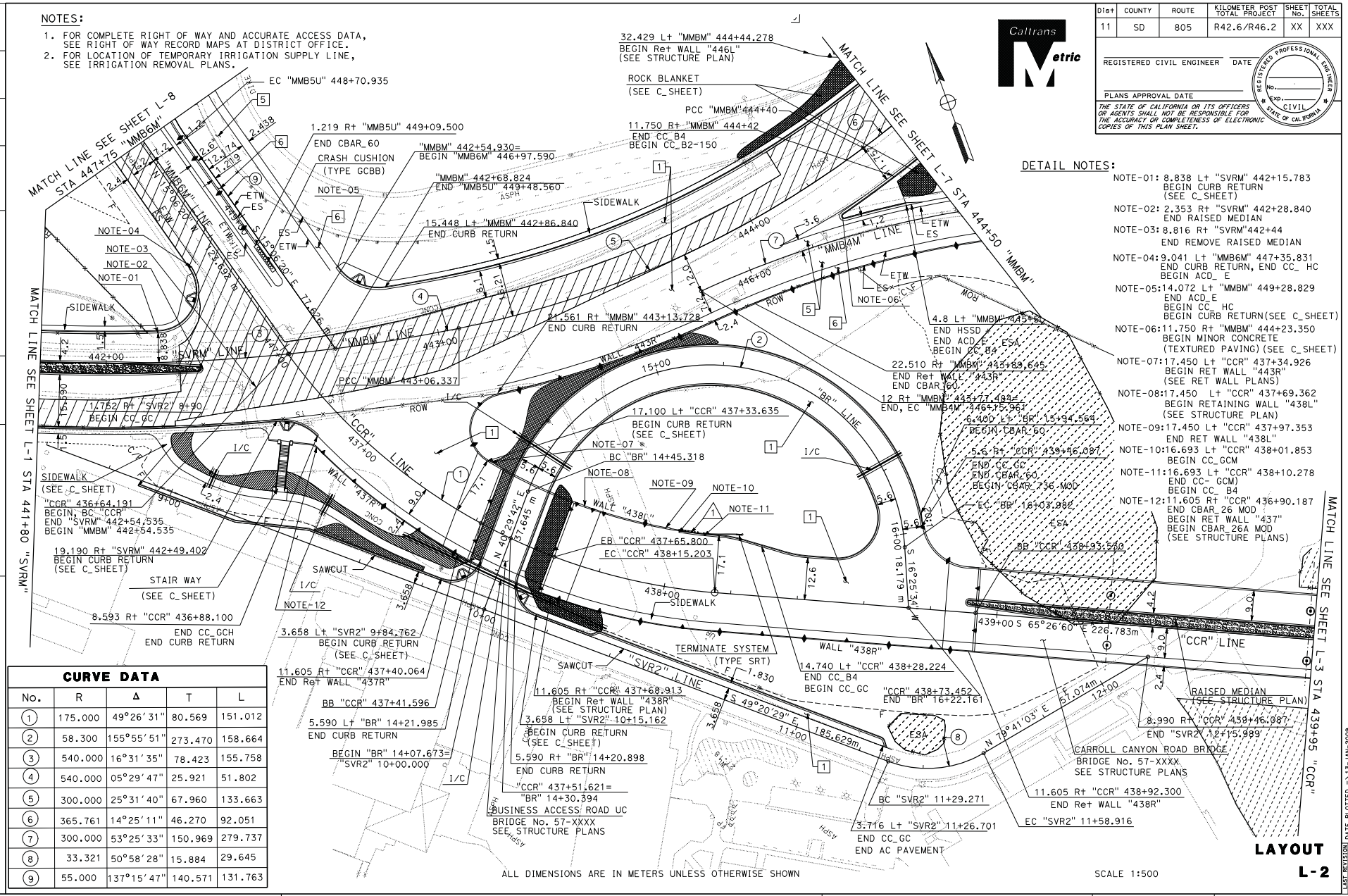
Caltrans Metric

NOTES:

1. FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.
2. FOR LOCATION OF TEMPORARY IRRIGATION SUPPLY LINE, SEE IRRIGATION REMOVAL PLANS.



DETAIL NOTES:

NOTE-01: 8.838 Lt "SVRM" 442+15.783
BEGIN CURB RETURN
(SEE C_SHEET)

NOTE-02: 2.353 Rt "SVRM" 442+28.840
END RAISED MEDIAN

NOTE-03: 8.816 Rt "SVRM"442+44
END REMOVE RAISED MEDIAN

NOTE-04: 9.041 Lt "MMB6M" 447+35.831
END CURB RETURN, END CC_ HC
BEGIN ACD_ E

NOTE-05: 14.072 Lt "MMBM" 449+28.829
END ACD_E
BEGIN CC_ HC
BEGIN CURB RETURN(SEE C_SHEET)

NOTE-06: 11.750 Rt "MMBM" 444+23.350
BEGIN MINOR CONCRETE
(TEXTURED PAVING)(SEE C_SHEET)

NOTE-07: 17.450 Lt "CCR" 437+34.926
BEGIN RET WALL "443R"
(SEE RET WALL PLANS)

NOTE-08: 17.450 Lt "CCR" 437+69.362
BEGIN RETAINING WALL "438L"
(SEE STRUCTURE PLAN)

NOTE-09: 17.450 Lt "CCR" 437+97.353
END RET WALL "438L"

NOTE-10: 16.693 Lt "CCR" 438+01.853
BEGIN CC_GCM

NOTE-11: 16.693 Lt "CCR" 438+10.278
END CC- GCM)
BEGIN CC_ B4

NOTE-12: 11.605 Rt "CCR" 436+90.187
END CBAR_26 MOD
BEGIN RET WALL "437"
BEGIN CBAR_26A MOD
(SEE STRUCTURE PLANS)

CURVE DATA

No.	R	Δ	T	L
1	175.000	49°26'31"	80.569	151.012
2	58.300	155°55'51"	273.470	158.664
3	540.000	16°31'35"	78.423	155.758
4	540.000	05°29'47"	25.921	51.802
5	300.000	25°31'40"	67.960	133.663
6	365.761	14°25'11"	46.270	92.051
7	300.000	53°25'33"	150.969	279.737
8	33.321	50°58'28"	15.884	29.645
9	55.000	137°15'47"	140.571	131.763

LAYOUT
L-2

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

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BORDER LAST REVISED 3/1/2007 | RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80 | USERNAME => s126991 | DGN FILE => b2T0401ea002.dgn | CU 11275 | EA 2T0401

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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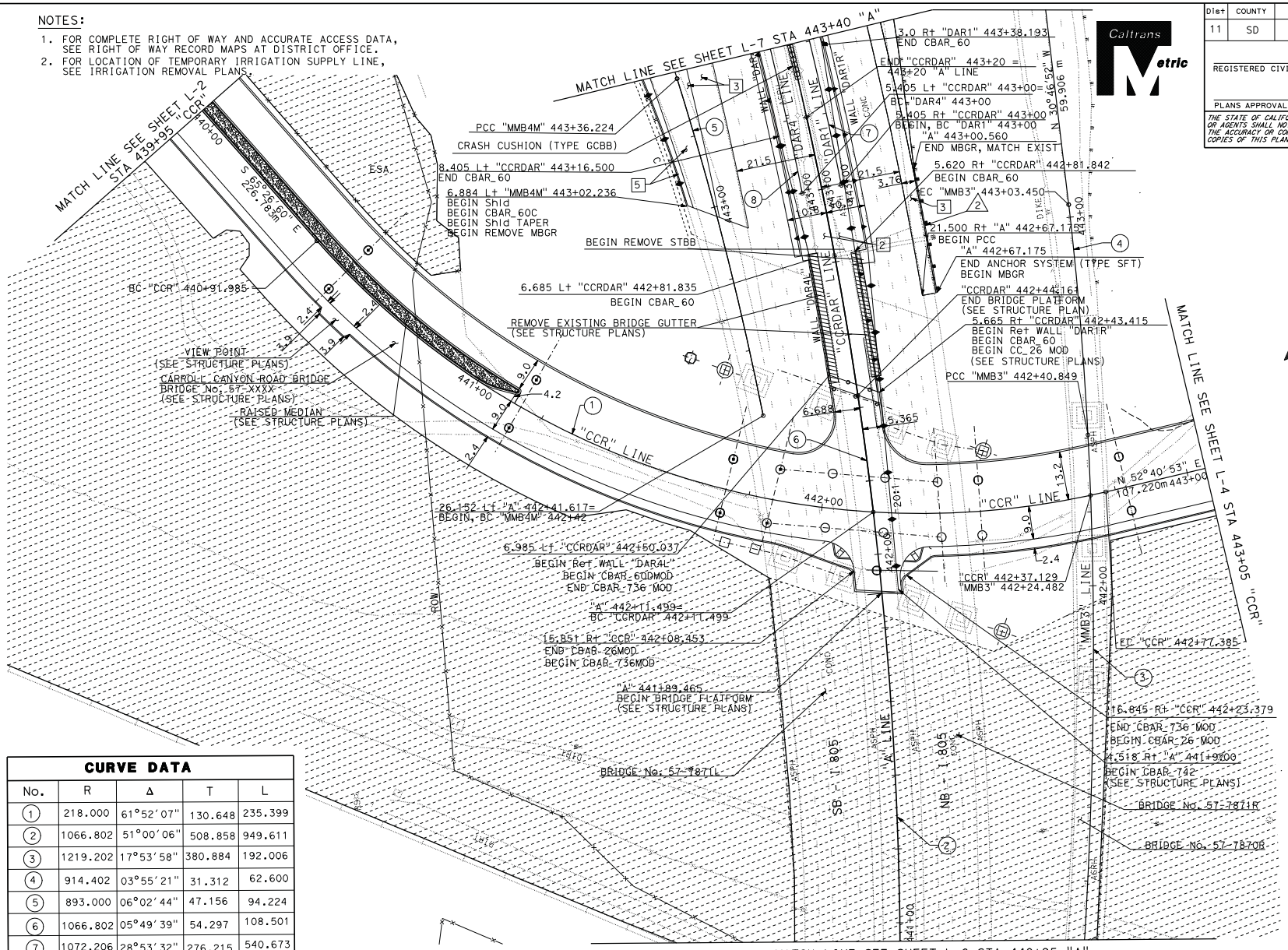
Caltrans Metric

NOTES:

1. FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.
2. FOR LOCATION OF TEMPORARY IRRIGATION SUPPLY LINE, SEE IRRIGATION REMOVAL PLANS.



CURVE DATA

No.	R	Δ	T	L
1	218.000	61°52'07"	130.648	235.399
2	1066.802	51°00'06"	508.858	949.611
3	1219.202	17°53'58"	380.884	192.006
4	914.402	03°55'21"	31.312	62.600
5	893.000	06°02'44"	47.156	94.224
6	1066.802	05°49'39"	54.297	108.501
7	1072.206	28°53'32"	276.215	540.673
8	1061.397	11°08'58"	103.599	206.544

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE 1:500

LAYOUT L-3

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

FUNCTIONAL SUPERVISOR | CALCULATED-DESIGNED BY | CHECKED BY | REVISED BY | DATE REVISED

LAST REVISION 01-12-09 | DATE PLOTTED => 13-JAN-2009 | TIME PLOTTED => 17:38

BORDER LAST REVISED 3/1/2007

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => s126991
DGN FILE => b2T0401ea003.dgn

CU 11275

EA 2T0401

NOTES:

1. FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.
2. FOR LOCATION OF TEMPORARY IRRIGATION SUPPLY LINE, SEE IRRIGATION REMOVAL PLANS.

CURVE DATA

No.	R	DELTA	T	L
1	260	29°19'28"	68.026	133.070
2	1100	6°30'30"	62.543	124.952

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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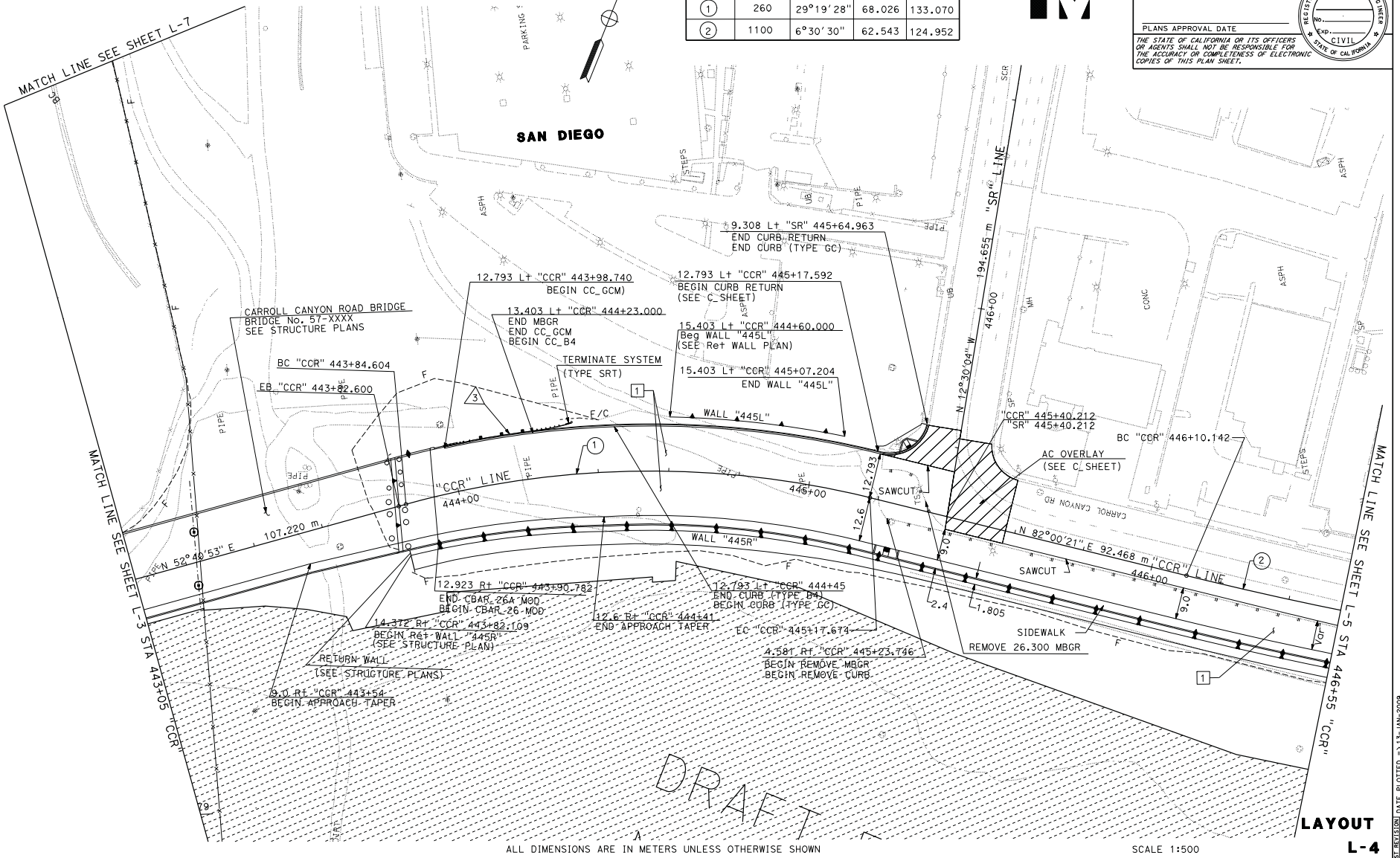
REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA



ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE 1:500

LAYOUT L-4

REVISED BY | DATE REVISED | CALCULATED-DESIGNED BY | CHECKED BY | FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

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BORDER LAST REVISED 3/1/2007 | RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80 | USERNAME => s126991 | DGN FILE => b2T0401ea004.dgn | CU 11275 | EA 2T0401

NOTES:

1. FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.
2. FOR LOCATION OF TEMPORARY IRRIGATION SUPPLY LINE, SEE IRRIGATION REMOVAL PLANS.

CURVE DATA

No.	R	Δ	L	T
1	1100.000	06°30'30"	62.543	124.952

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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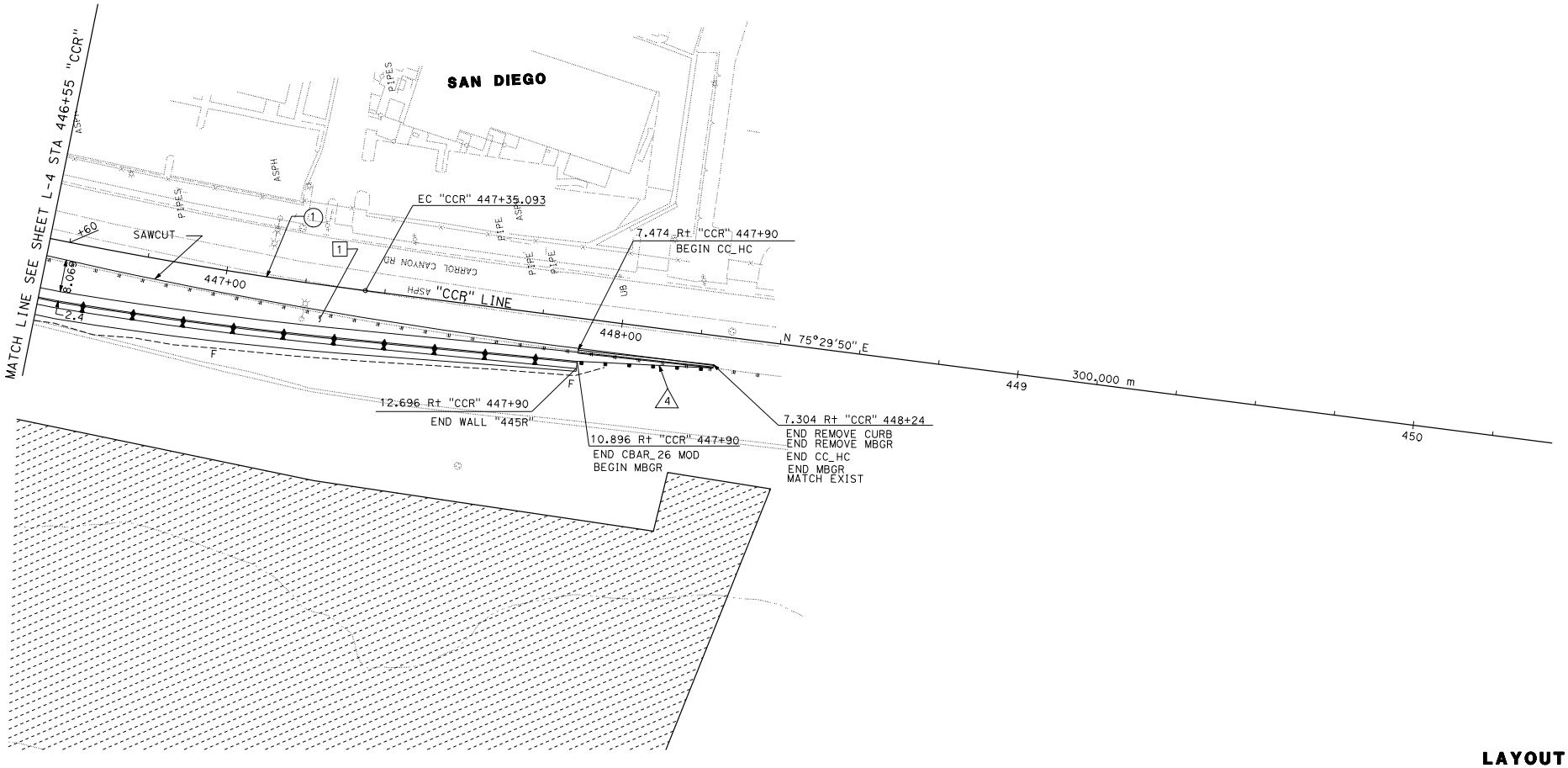

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE 1:500

LAYOUT

L-5

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

FUNCTIONAL SUPERVISOR

CALCULATED-DESIGNED BY

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DATE REVISED

LAST REVISION 01-12-09

DATE PLOTTED => 13-JAN-2009

TIME PLOTTED => 17:39

BORDER LAST REVISED 3/1/2007

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => s126991

DGN FILE => b2T0401ea005.dgn

CU 11275

EA 2T0401

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER NO. EXP. CIVIL STATE OF CALIFORNIA

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Caltrans Metric

NOTES:

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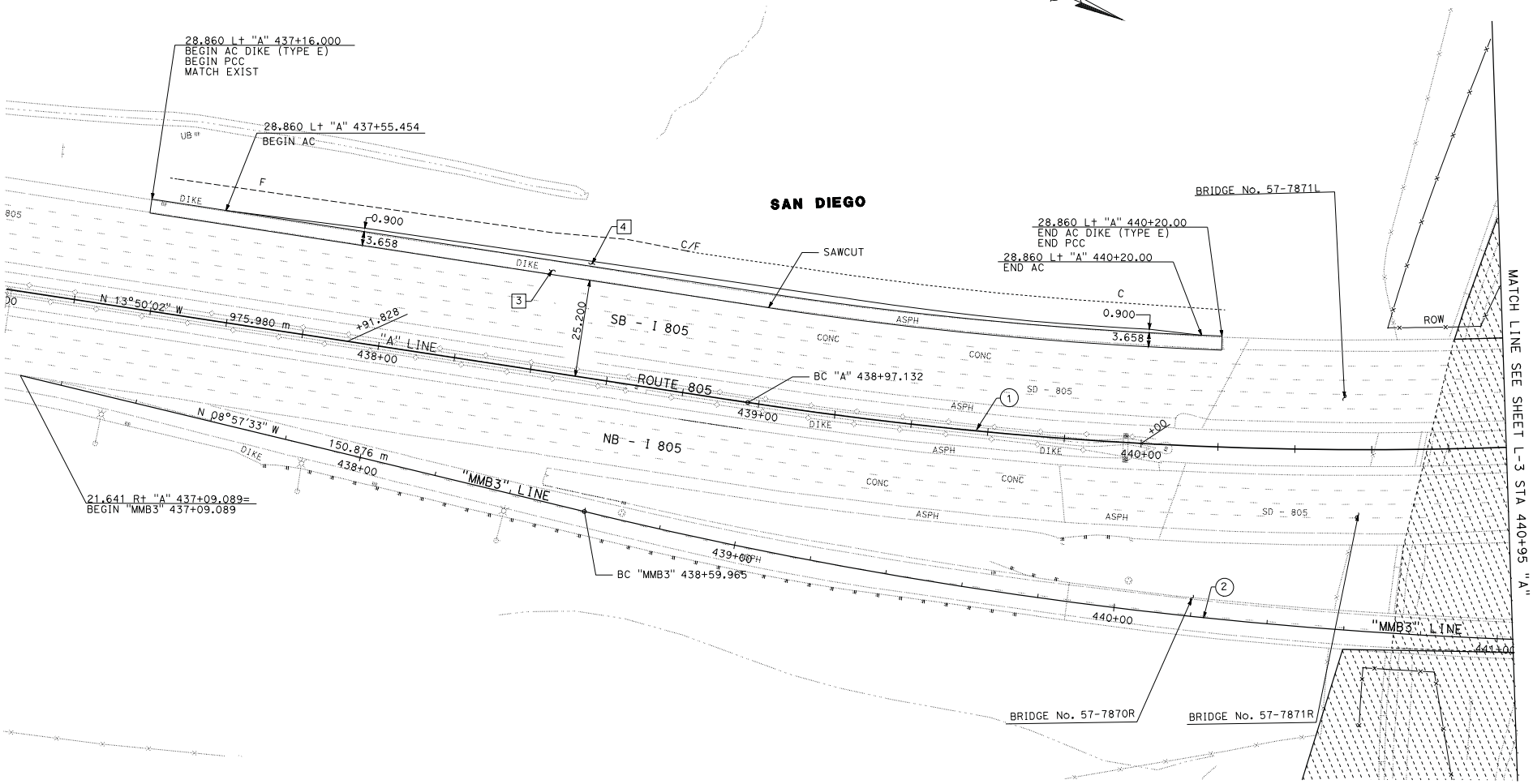
2. FOR LOCATION OF TEMPORARY IRRIGATION SUPPLY LINE, SEE IRRIGATION REMOVAL PLANS.

CURVE DATA

No.	R	Δ	T	L
1	1066.802	51°00'06"	508.858	949.611
2	1219.202	17°53'58"	192.006	380.884



ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE 1:500

LAYOUT

L-6

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION 01-12-09

DATE PLOTTED => 13-JAN-2009
TIME PLOTTED => 17:39

BORDER LAST REVISED 3/1/2007

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => s126991
DGN FILE => b2T0401ea006.dgn

CU 11275

EA 2T0401

District	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER NO. EXP. CIVIL STATE OF CALIFORNIA

Caltrans Metric

NOTES:

1. FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.
2. FOR LOCATION OF TEMPORARY IRRIGATION SUPPLY LINE, SEE IRRIGATION REMOVAL PLANS.

DETAIL NOTES:

NOTE-01: 10.811 Lt "MMB5U" 445+85.700
BEGIN ACD_ F

NOTE-02: Sta 445+93.300 "MMB5U"
END ACD_F
BEGIN ACD_C

NOTE-03: "MMBM" 444+87.479
BEGIN REMOVE EXISTING MBGR

NOTE-04: "MMBM" 445+07.570
REMOVE EXISTING RETURN WALL
END REMOVE EXISTING MBGR
END AC GUTTER
MATCH EXIST

NOTE-05: 39.385 Lt "A" 444+65.115
END ACD_E
BEGIN TEMP RAILING (TYPE K)
BEGIN ACD_A

NOTE-06: 43.550 Lt "A" 445+15.779
END TEMP RAILING (TYPE K)
END ACD_A

NOTE-07: 13.275 Rt "MMBM" 445+07.507
END CBAR_B2-150
END AC DITCH
MATCH EXIST

NOTE-08: 18.912 Lt "MMBM" 444+86.781
END RET WALL "446L"
END SIDEWALK, END SIDE WALK, END CC_HC
MATCH EXIST

NOTE-09: "MMBM" 444+90.388
END MC(TP)

NOTE-10: "A" 445+56.638
21.5 Rt BEGIN SAWCUT
21.5 Rt BEGIN PCC
BEGIN ACD_E

NOTE-11: "DAR4" 444+44.007
END WALL "DAR4L"
BEGIN CBAR_60C

NOTE-12: 8.405 Rt "A" 444+88.544
END CBAR_60C

NOTE-13: 3.0 Rt "DAR1" 444+33.402
BEGIN CBAR_60C
END RET WALL "DAR1R"

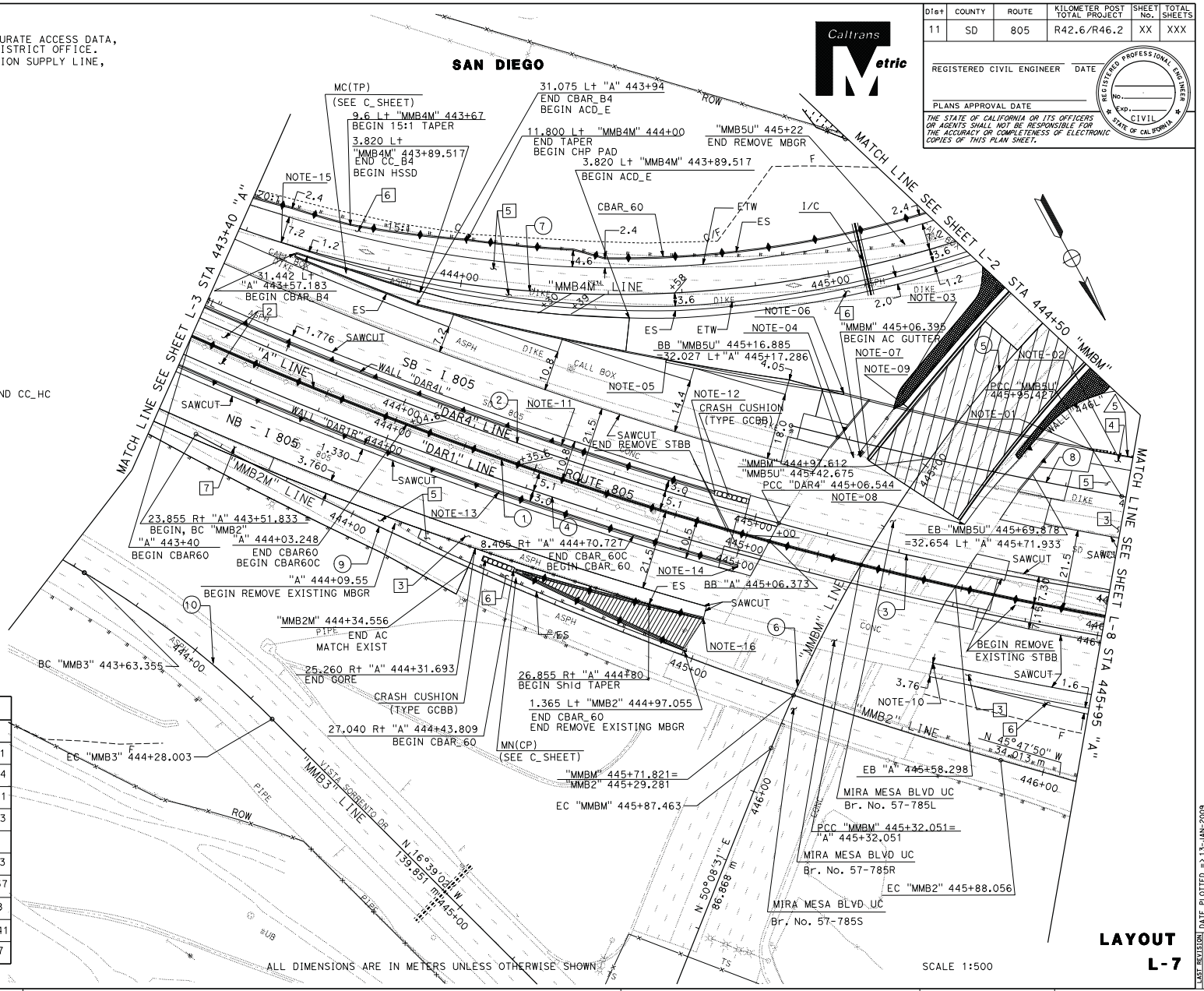
NOTE-14: 8.405 Rt "A" 445+00
END CBAR_60

NOTE-15: "MMB4M" 443+50
BEGIN 30:1 TAPER
7.2 Lt END TAPER
9.6 Lt END TAPER

NOTE-16: 24.522 Rt "A" 444+94.756
END CBAR_60
END PCC
END REMOVE EXISTING MBGR

CURVE DATA

N	R	Δ	T	L
1	1066.802	51°00'06"	508.858	949.611
2	1061.397	11°08'58"	103.599	206.544
3	825.345	10°31'37"	76.034	151.641
4	1072.206	28°53'32"	276.215	540.673
5	365.761	14°25'11"	46.270	92.051
6	365.761	08°40'49"	27.759	55.413
7	300.000	53°25'33"	150.969	279.737
8	1280.171	04°06'00"	45.824	91.608
9	1088.443	13°46'41"	131.505	261.741
10	262.129	14°07'50"	32.489	64.647



LAYOUT
L-7

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

FUNCTIONAL SUPERVISOR | CALCULATED-DESIGNED BY | CHECKED BY | REVISED BY | DATE REVISED

LAST REVISION 01-12-09 | DATE PLOTTED => 13-JAN-2009 | TIME PLOTTED => 17:39

BORDER LAST REVISED 3/1/2007 | RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80 | USERNAME => s126991 | DGN FILE => b2T0401ea007.dgn | CU 11275 | EA 2T0401

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER NO. EXP. CIVIL STATE OF CALIFORNIA

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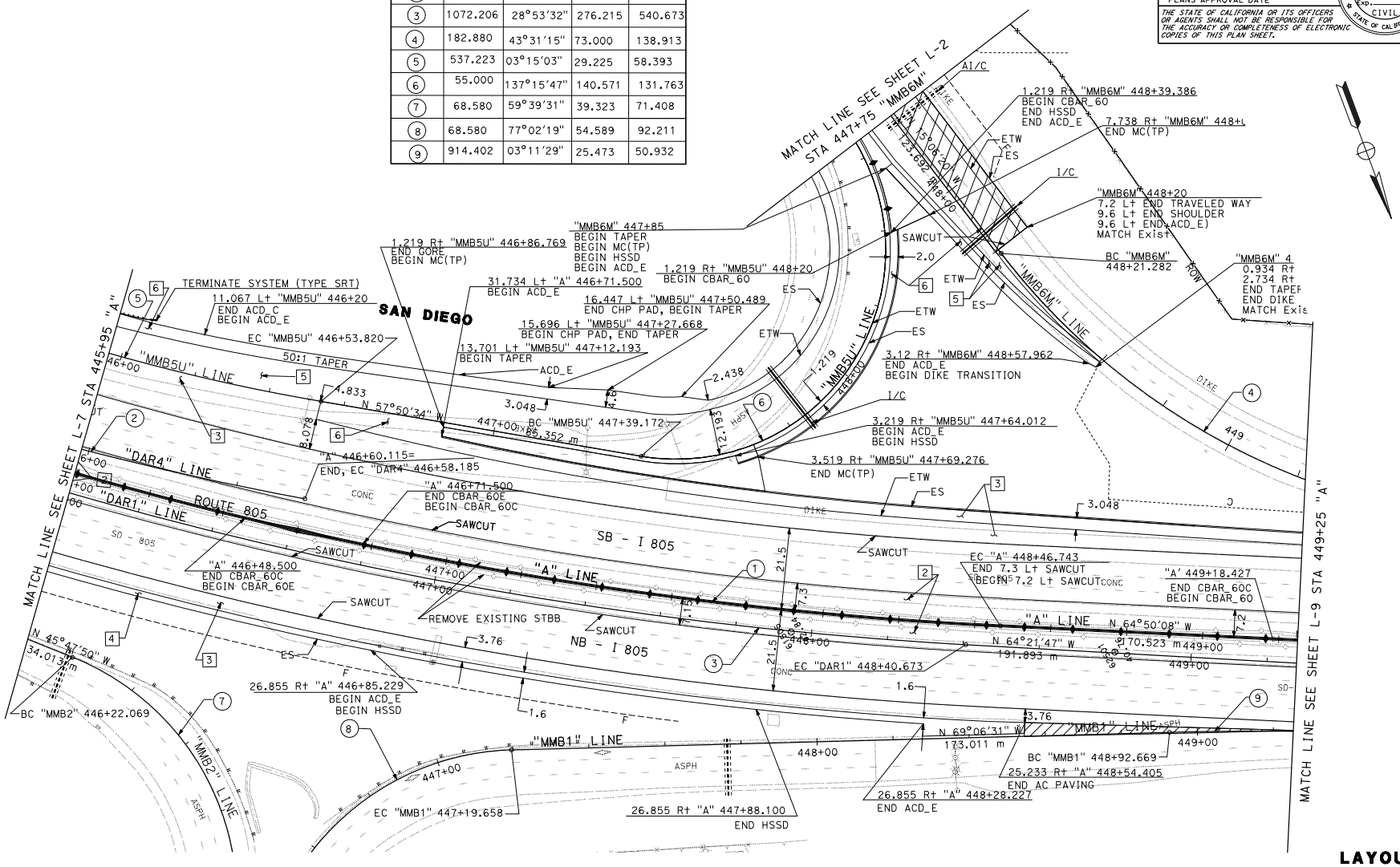
Caltrans Metric

NOTES:

1. FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.
2. FOR LOCATION OF TEMPORARY IRRIGATION SUPPLY LINE, SEE IRRIGATION REMOVAL PLANS.

CURVE DATA

No.	R	Δ	T	L
1	1066.802	51°00'06"	508.858	949.611
2	825.345	10°31'37"	76.034	151.641
3	1072.206	28°53'32"	276.215	540.673
4	182.880	43°31'15"	73.000	138.913
5	537.223	03°15'03"	29.225	58.393
6	55.000	137°15'47"	140.571	131.763
7	68.580	59°39'31"	39.323	71.408
8	68.580	77°02'19"	54.589	92.211
9	914.402	03°11'29"	25.473	50.932



ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE 1:500

LAYOUT
L-8

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

FUNCTIONAL SUPERVISOR | CALCULATED-DESIGNED BY | CHECKED BY | REVISED BY | DATE REVISED

LAST REVISION 01-12-09 | DATE PLOTTED => 13-JAN-2009 | TIME PLOTTED => 17:39

BORDER LAST REVISED 3/1/2007 | RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80 | USERNAME => s126991 | DGN FILE => b2T0401ea008.dgn | CU 11275 | EA 2T0401

NOTES:

1. FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.
2. FOR LOCATION OF TEMPORARY IRRIGATION SUPPLY LINE, SEE IRRIGATION REMOVAL PLANS.

CURVE DATA

No.	R	Δ	T	L
1	1524.003	28°08'03"	381.873	748.337
2	914.402	03°11'29"	25.473	50.932
3	182.880	43°31'15"	73.000	138.913

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER NO. EXP. CIVIL STATE OF CALIFORNIA

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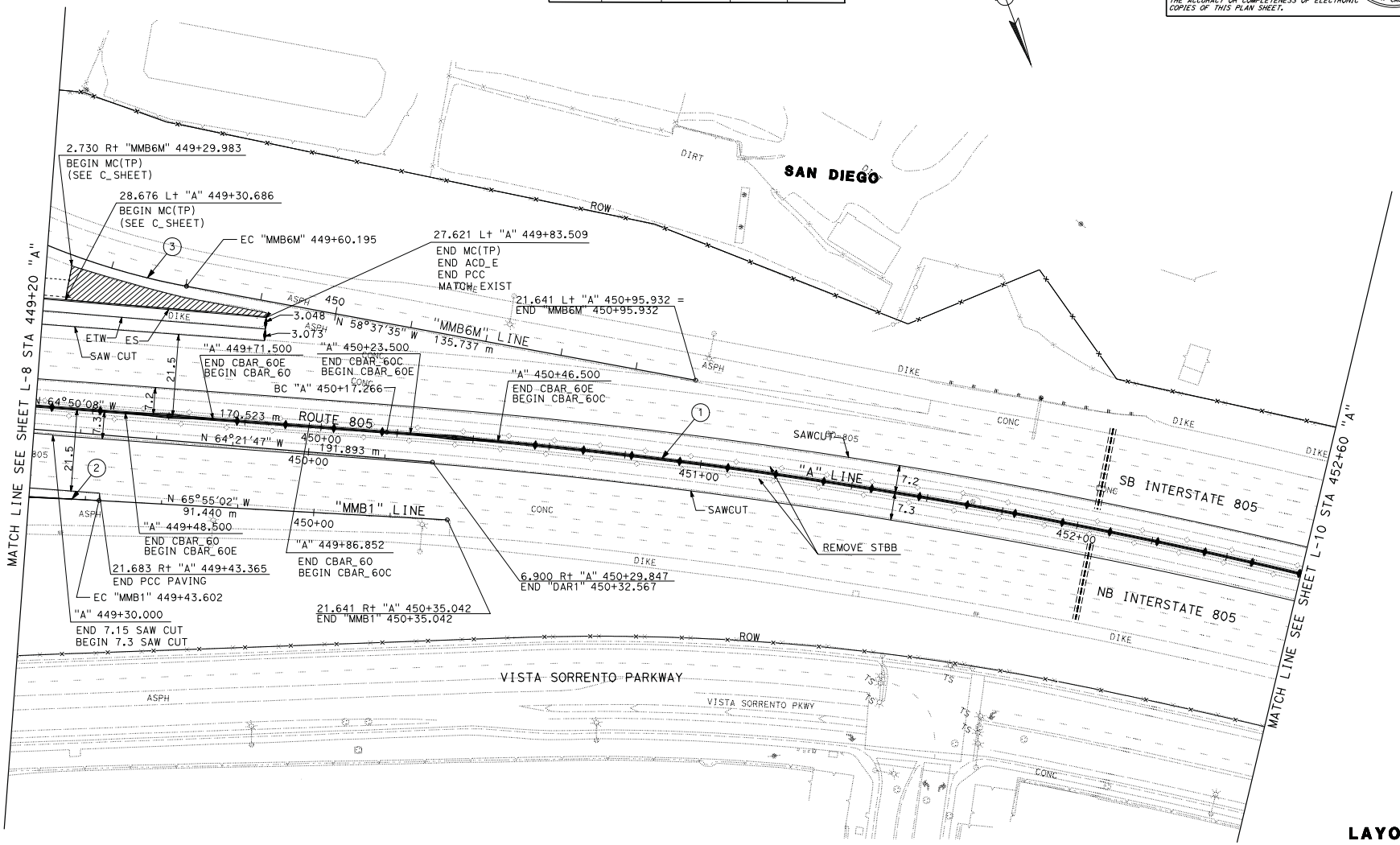

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE 1:500

LAYOUT
L-9

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DATE PLOTTED => 13-JAN-2009
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DATE REVISED

BORDER LAST REVISED 3/1/2007

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => s126991
DGN FILE => b2T0401ea009.dgn

CU 11275

EA 2T0401

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

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2. FOR LOCATION OF TEMPORARY IRRIGATION SUPPLY LINE, SEE IRRIGATION REMOVAL PLANS.

CURVE DATA

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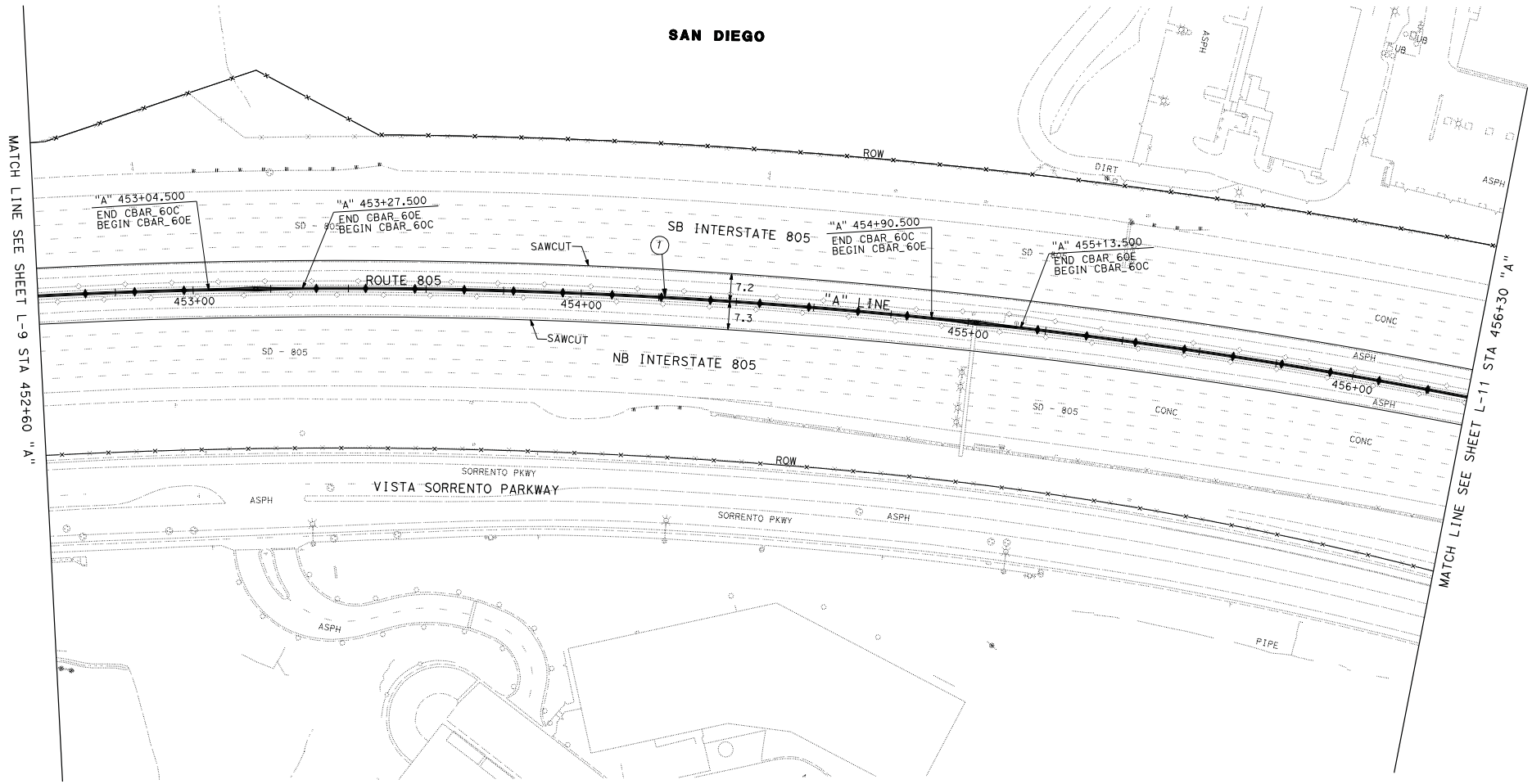
1	1524.003	28°08'03"	381.873	748.337



ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE 1:500

LAYOUT

L-10

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USERNAME => s126991

DGN FILE => b2T0401ea010.dgn

CU 11275

EA 2T0401

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

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2. FOR LOCATION OF TEMPORARY IRRIGATION SUPPLY LINE, SEE IRRIGATION REMOVAL PLANS.

CURVE DATA

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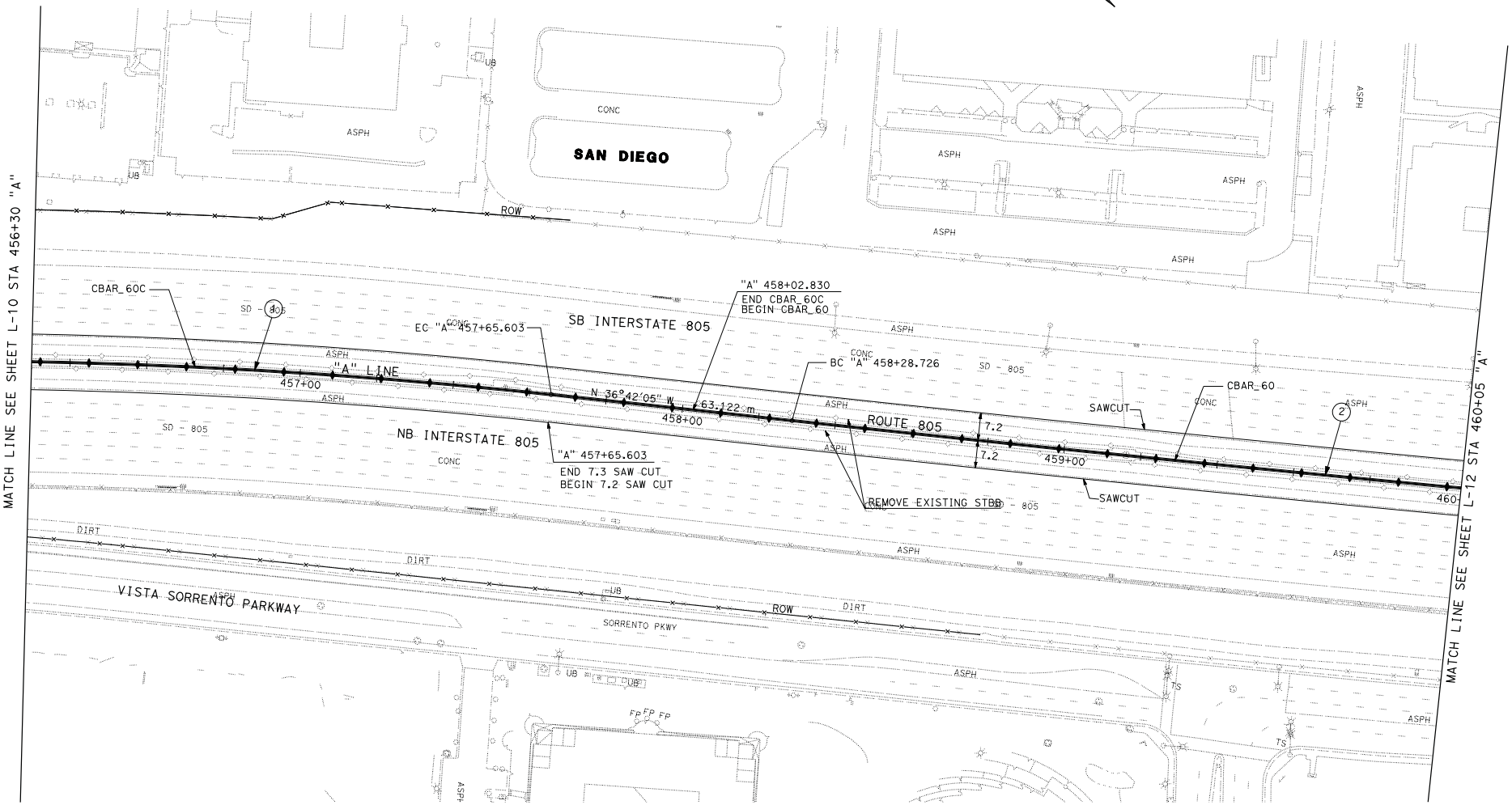
2	12192.024	03°12'44"	341.843	683.506



ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE 1:500

LAYOUT

L-11

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DATE PLOTTED => 13-JAN-2009
TIME PLOTTED => 17:40

BORDER LAST REVISED 3/1/2007

RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => s126991
DGN FILE => b2T0401ea011.dgn

CU 11275

EA 2T0401

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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1. FOR COMPLETE RIGHT OF WAY AND ACCURATE ACCESS DATA, SEE RIGHT OF WAY RECORD MAPS AT DISTRICT OFFICE.
2. FOR LOCATION OF TEMPORARY IRRIGATION SUPPLY LINE, SEE IRRIGATION REMOVAL PLANS.

CURVE DATA

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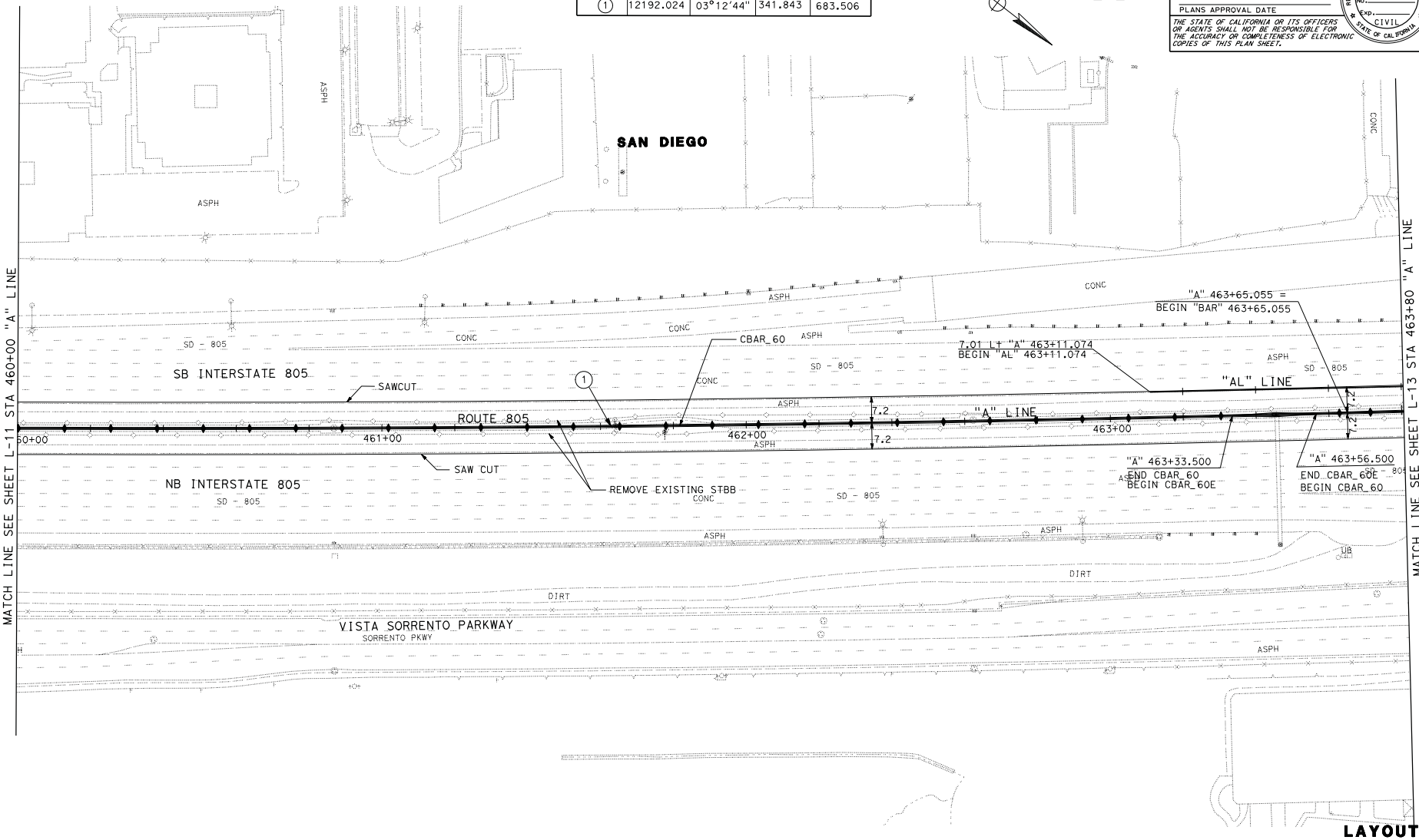

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LAYOUT

L-12

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Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

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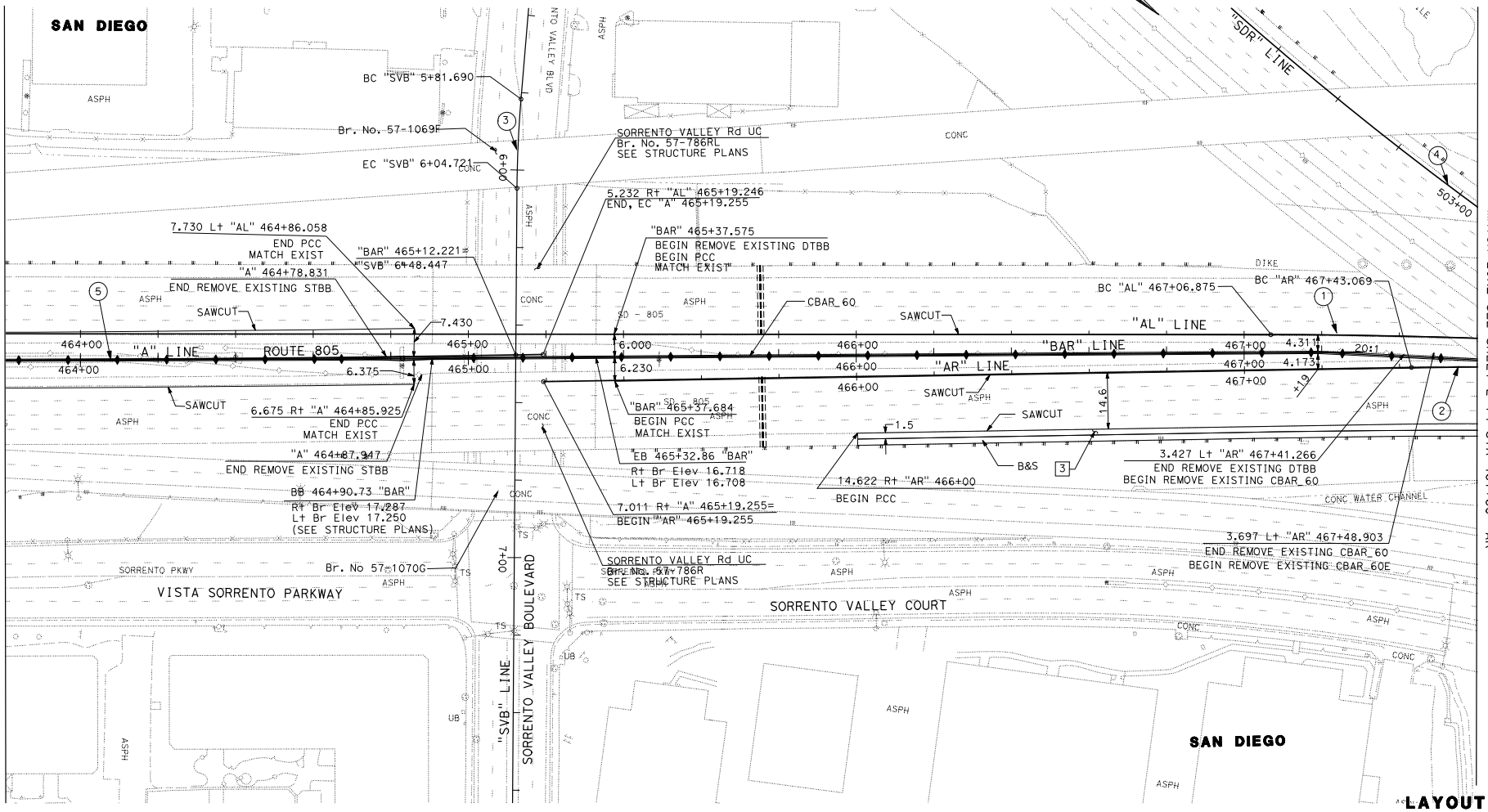
2. FOR LOCATION OF TEMPORARY IRRIGATION SUPPLY LINE, SEE IRRIGATION REMOVAL PLANS.

CURVE DATA

No.	R	Δ	T	L
1	1524.003	12°15'05"	163.560	325.873
2	914.402	13°13'47"	106.040	211.137
3	304.801	04°19'46"	11.521	23.031
4	914.402	53°47'42"	463.853	858.533
5	12192.024	3°14'42"	345.357	690.530



ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE 1:500

LAYOUT

L-13

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RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => s126991
DGN FILE => b2T0401ea013.dgn

CU 11275

EA 2T0401

Dist	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2	XX	XXX

REGISTERED CIVIL ENGINEER DATE

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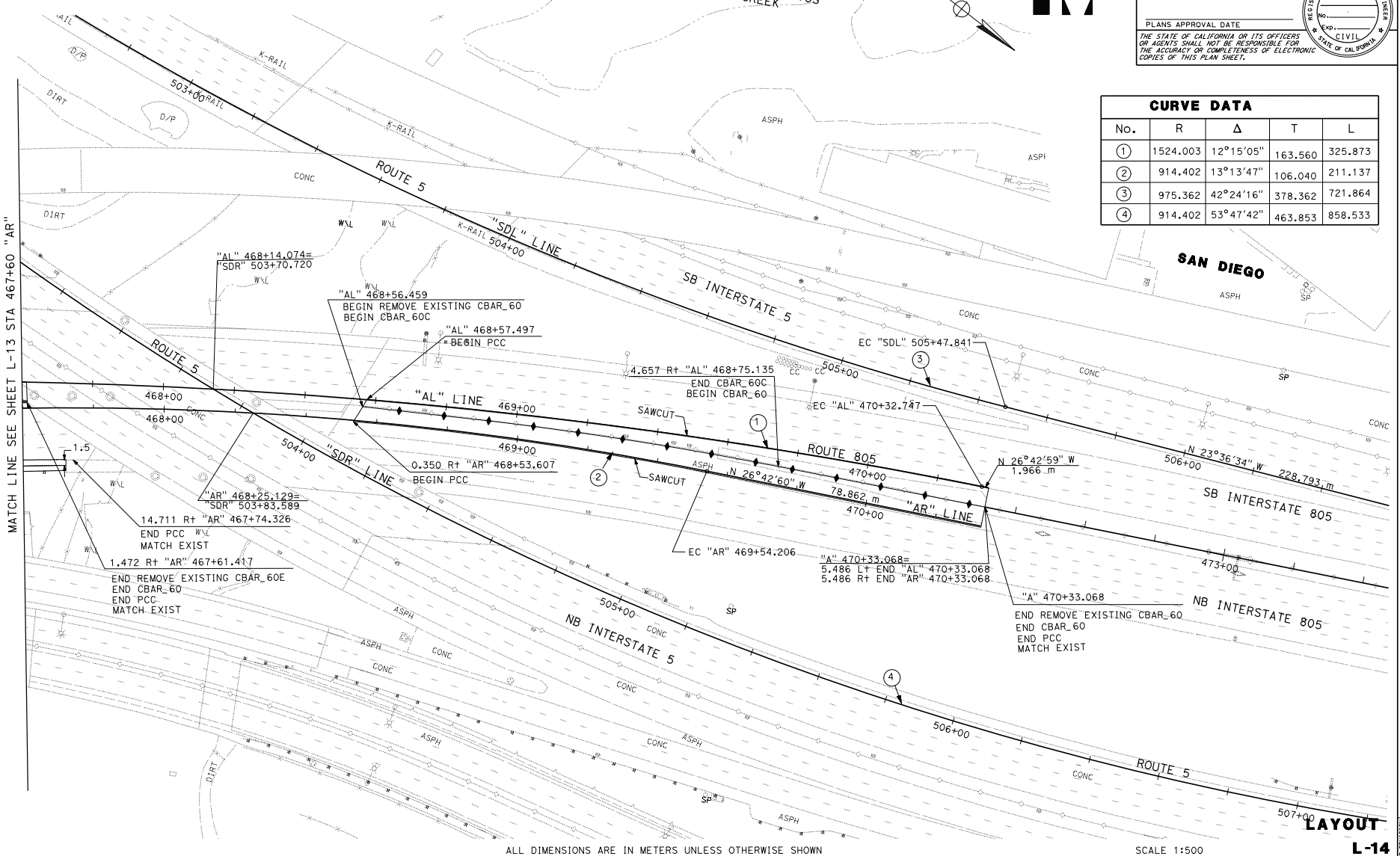

CURVE DATA				
No.	R	Δ	T	L
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2	914.402	13°13'47"	106.040	211.137
3	975.362	42°24'16"	378.362	721.864
4	914.402	53°47'42"	463.853	858.533

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE 1:500

LAYOUT

L-14

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RELATIVE BORDER SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => s126991

DGN FILE => b2T0401ea014.dgn

CU 11275

EA 2T0401

Attachment G

Profiles and Super Elevation Diagrams

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2		XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER S.A. ALVI No. C 55293 Exp. 12-31-08 CIVIL STATE OF CALIFORNIA

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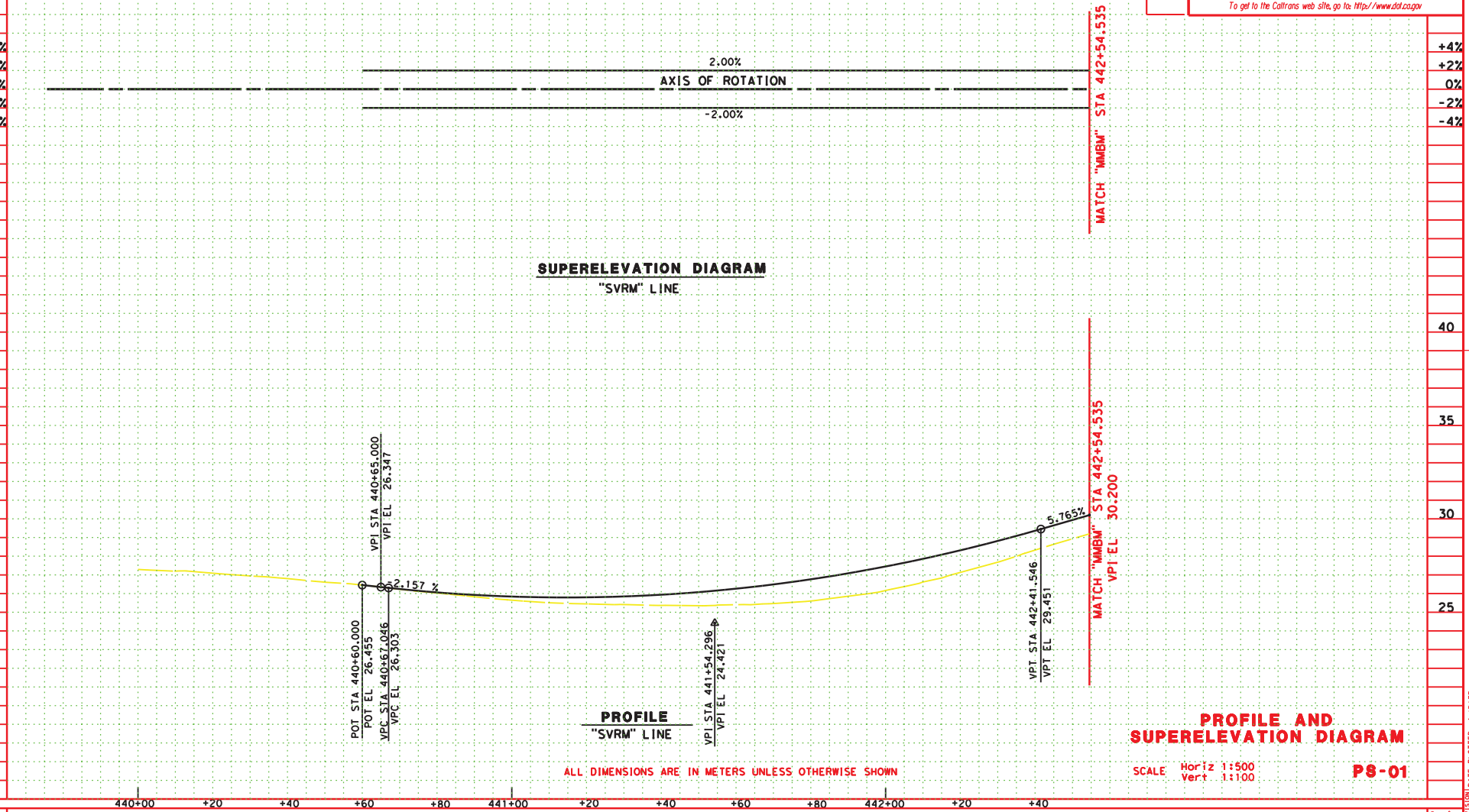

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE Horiz 1:500
Vert 1:100

PROFILE AND SUPERELEVATION DIAGRAM

PS-01

Station	Exc	Emb
m^3		

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PROJECT ENGINEER S.A. ALVI

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DATE REVISED

DATE

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CU 11275

EA 2T0401

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2		XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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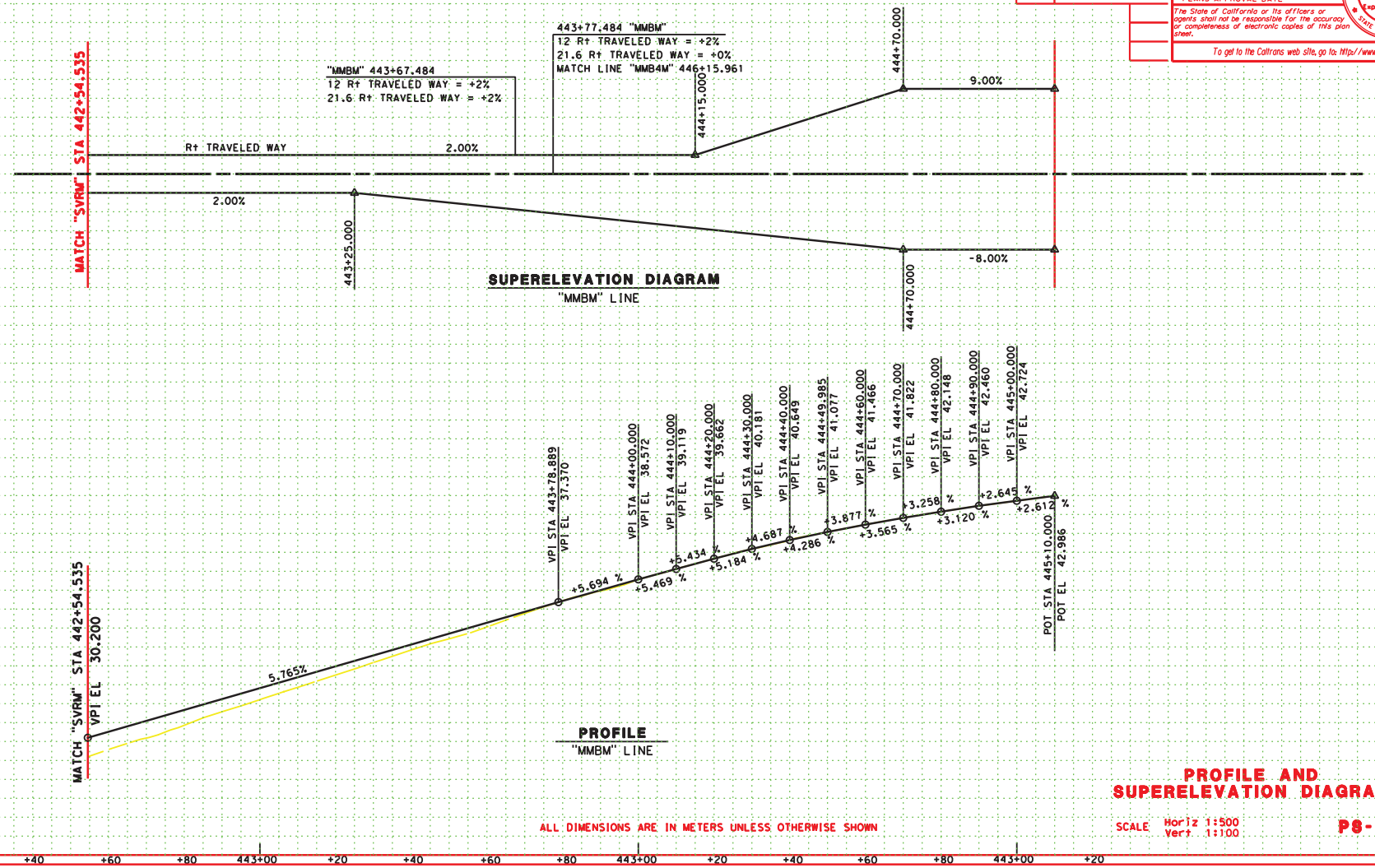

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PROFILE AND SUPERELEVATION DIAGRAM

SCALE Horiz 1:500 Vert 1:100

P8-02

Station	Exc	Emb	m³

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11	SD	805	R42.6/R46.2		XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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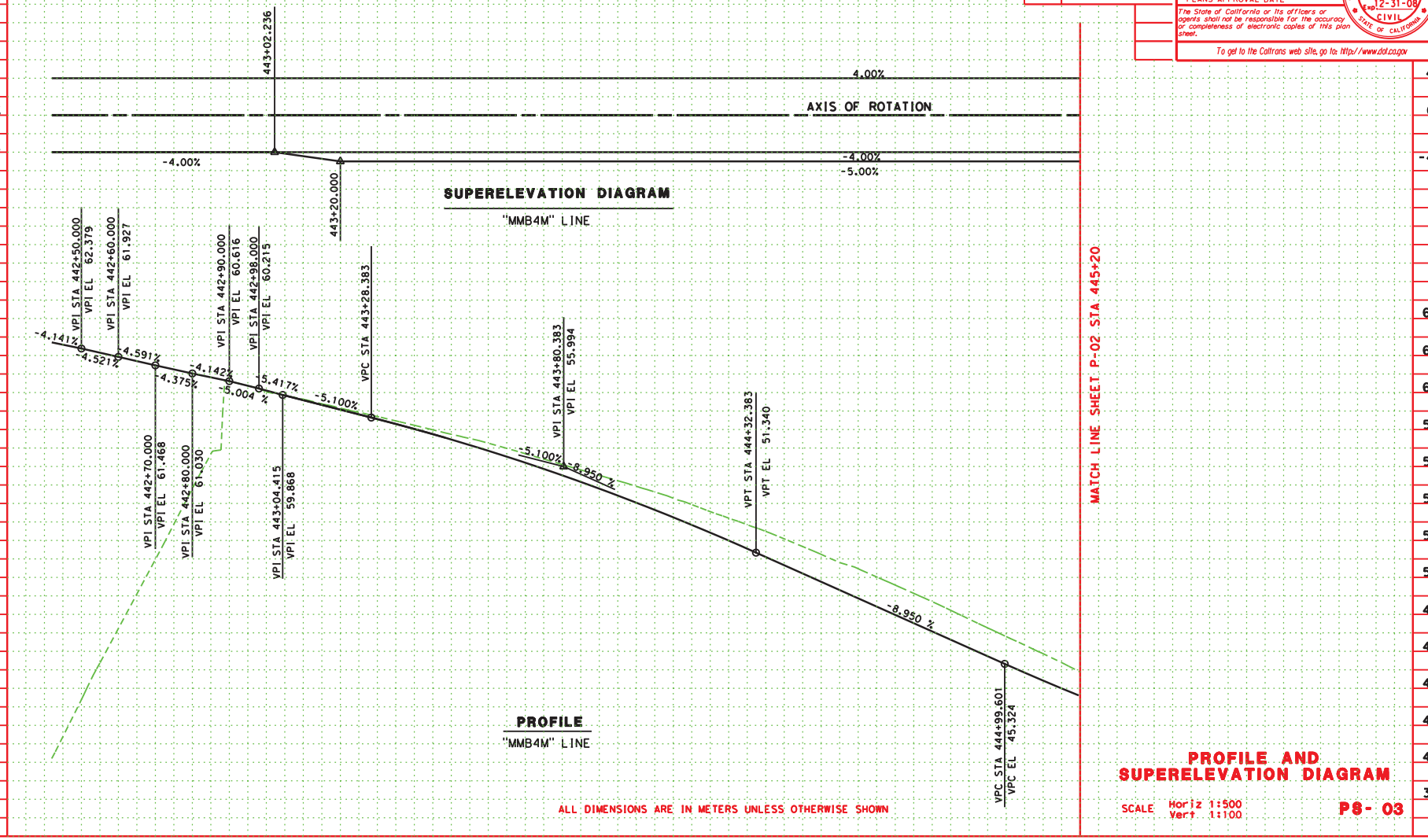

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

PROFILE AND SUPERELEVATION DIAGRAM

SCALE Horiz 1:500 Vert 1:100

P8- 03

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CU 11275

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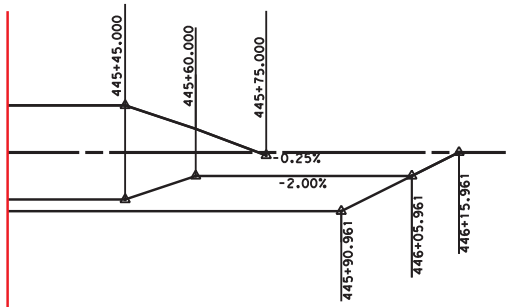
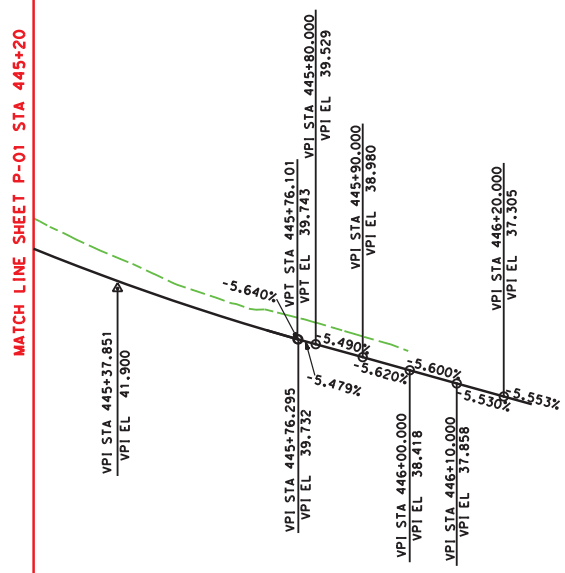


SUPERELEVATION DIAGRAM

"MMB4M" LINE



PROFILE

"MMB4M" LINE

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

PROFILE AND SUPERELEVATION DIAGRAM

SCALE Horiz 1:500

PS-04

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11	SD	805	R42.6/R46.2		XXX

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PLANS APPROVAL DATE

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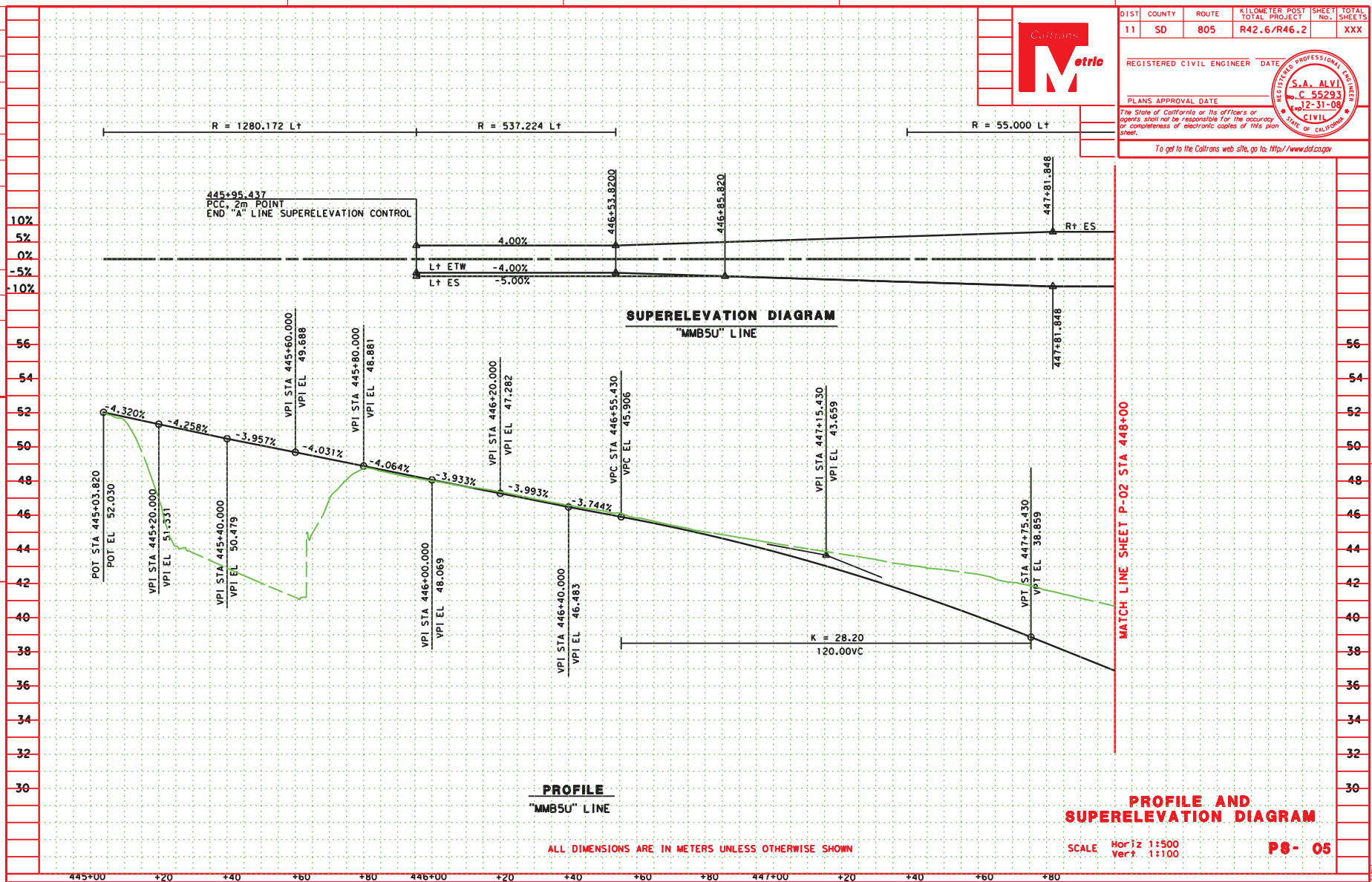

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE Horiz 1:500 Vert 1:100

PROFILE AND SUPERELEVATION DIAGRAM

P8- 05

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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TIME PLOTTED => $TIME

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CU 11275

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11	SD	805	R42.6/R46.2		XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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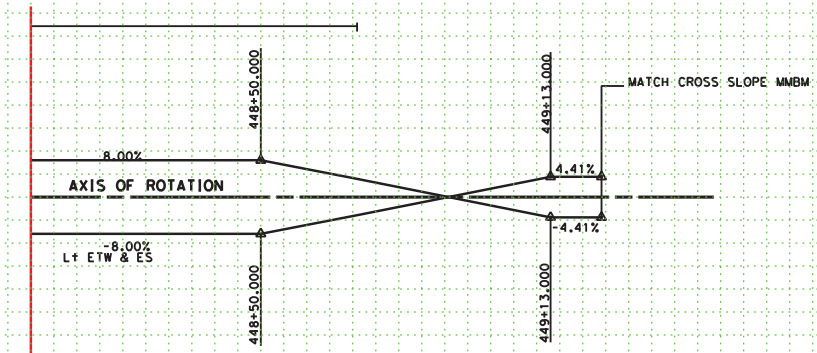
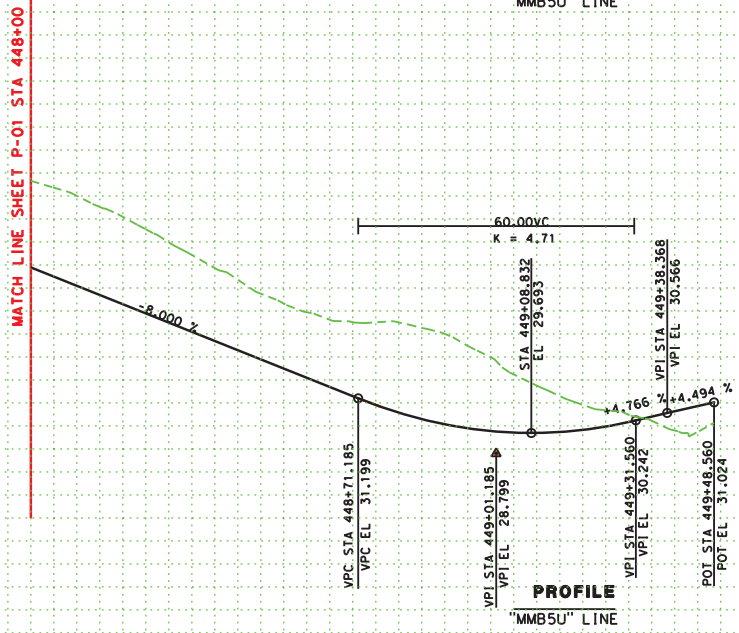


SUPERELEVATION DIAGRAM

"MMB5U" LINE



PROFILE

"MMB5U" LINE

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

PROFILE AND SUPERELEVATION DIAGRAM

SCALE Horiz 1:500 Vert 1:100

P8-06

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11	SD	805	R42.6/R46.2		XXX

REGISTERED CIVIL ENGINEER DATE

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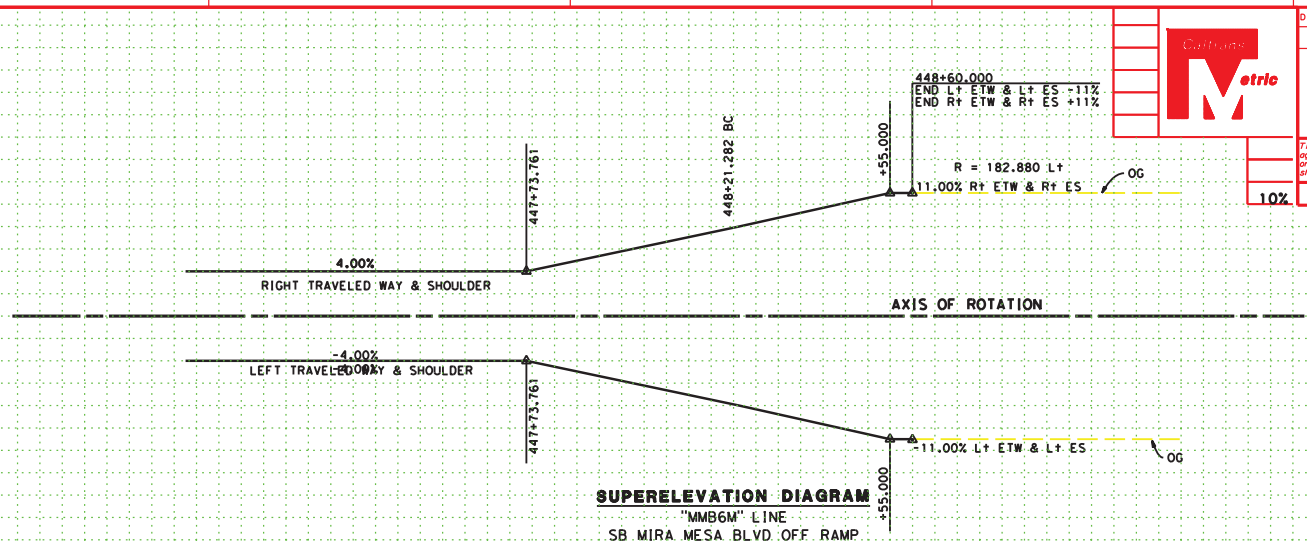
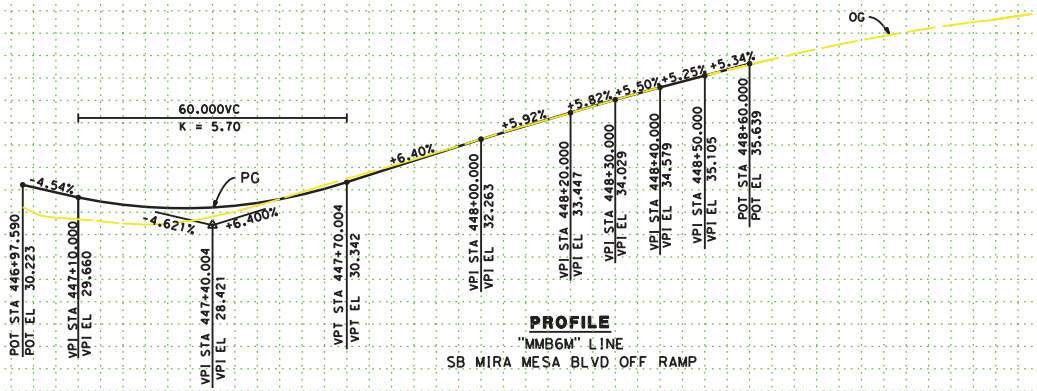


SUPERELEVATION DIAGRAM
"MMB6M" LINE
SB MIRA MESA BLVD OFF RAMP



PROFILE
"MMB6M" LINE
SB MIRA MESA BLVD OFF RAMP

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

PROFILE AND SUPERELEVATION DIAGRAM

SCALE Horiz 1:500 Vert 1:100

P8- 07

Station 467+00 +20 +40 +60 +80 468+00 +20 +40 +60 +80 469+00

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11	SD	805	R42.6/R46.2		XXX

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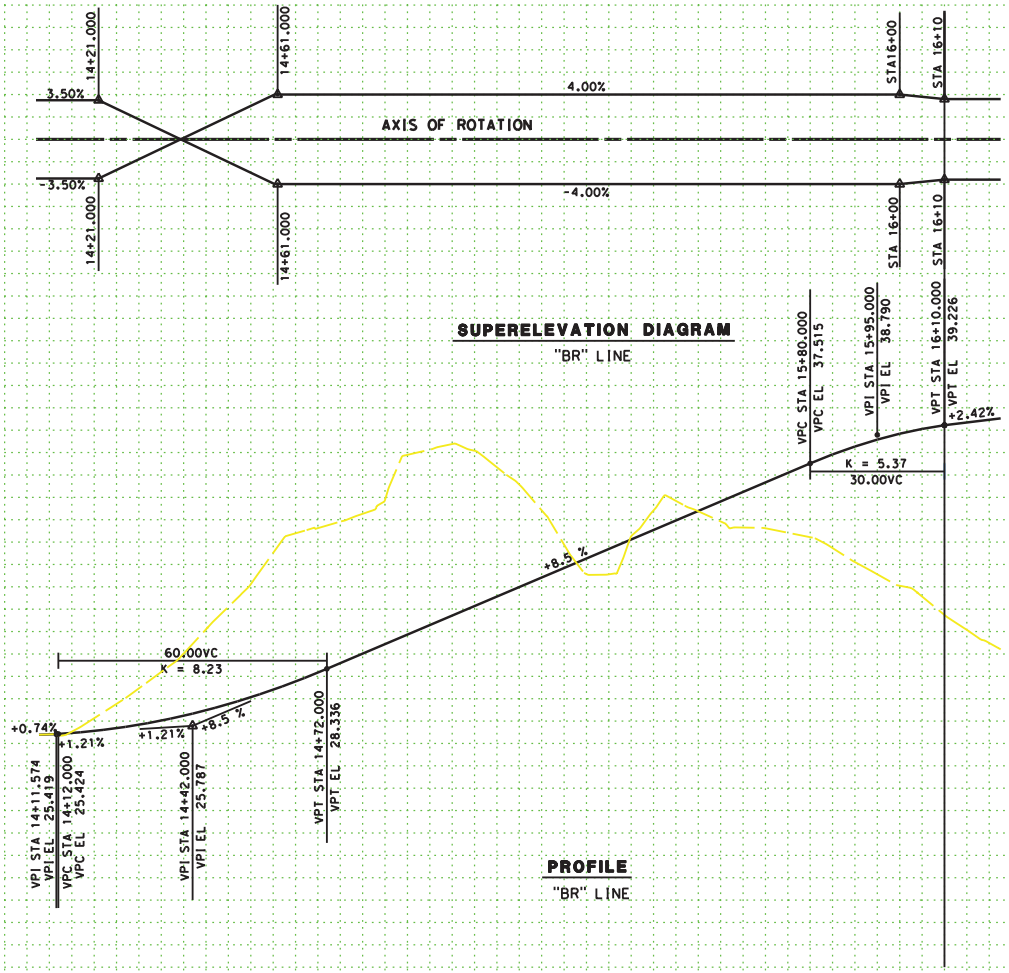

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

PROFILE AND SUPERELEVATION DIAGRAM

SCALE Horiz 1:500 Vert 1:100

P8-08

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

PROJECT DEVELOPMENT

PROJECT ENGINEER S.A. ALVI

CALCULATED/DESIGNED BY

CHECKED BY

DATE REVISED BY

DATE REVISED

LAST REVISION 02-29-08

DATE PLOTTED => $DATE

TIME PLOTTED => $TIME

FORM - - - (REV.01/07)

FOR REDUCED PLANS ORIGINAL SCALE IS IN MILLIMETERS 0 20 40 60 80

USERNAME => $USER

DGN FILE => $REQUEST

CU 11275

EA 2T0401

b2T0401ufb008.dgn 11/19/2008 9:31:18 AM

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
11	SD	805	R42.6/R46.2		XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER S.A. ALVI C 55293 12-31-08 CIVIL STATE OF CALIFORNIA

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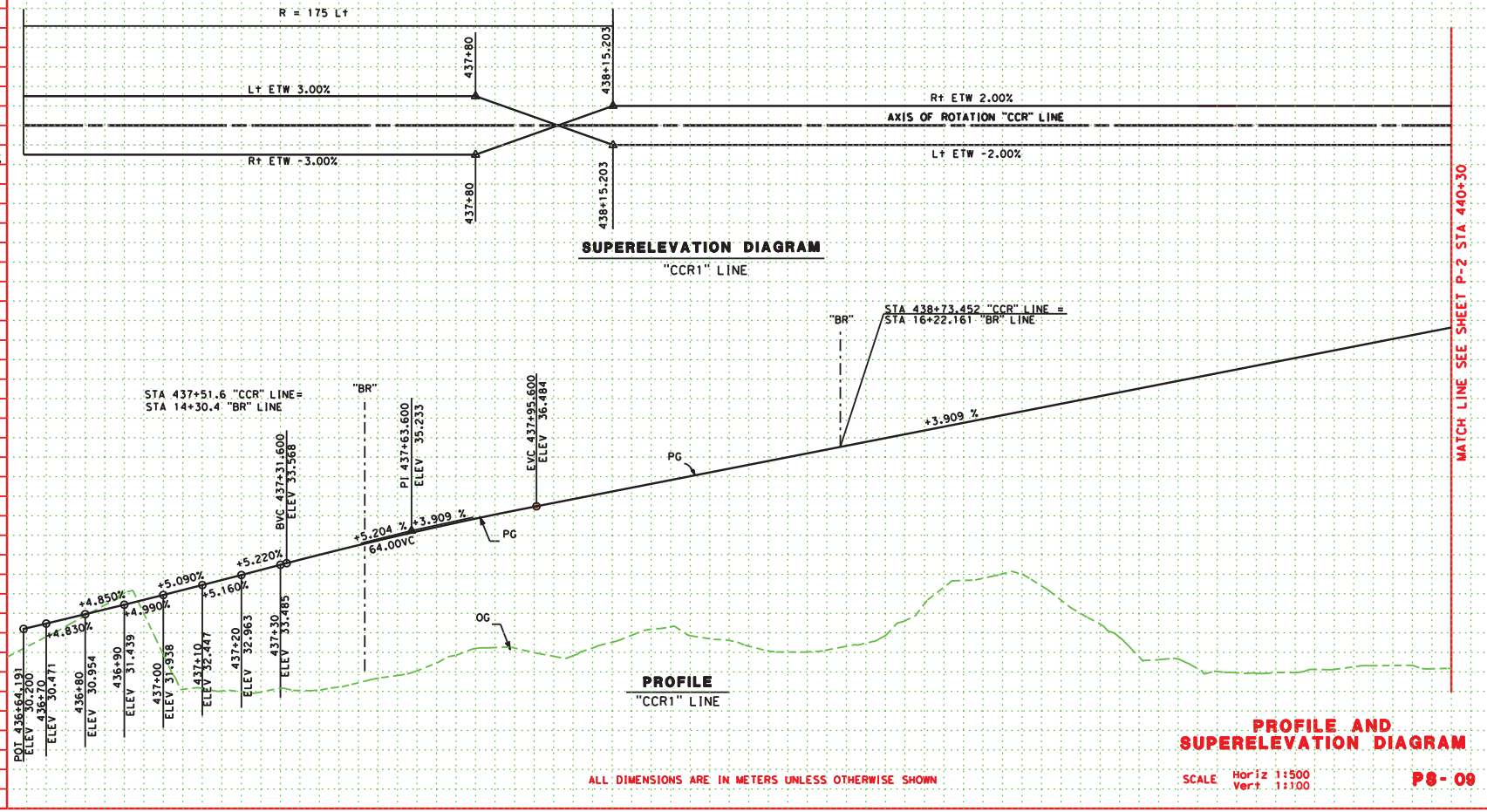

PROFILE AND SUPERELEVATION DIAGRAM

SCALE Horiz 1:500 Vert 1:100

P8-09

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

Station: +80, 437+00, +20, +40, +60, +80, 438+00, +20, +40, +60, +80, 439+00, +20, +40, +60, +80, 440+00, +20

m³ Exc Emb

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER S.A. ALVI

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CU 11275

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LAST REVISION 02-29-08

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11	SD	805	R42.6/R46.2		XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER S.A. ALVI No. C 55293 Exp. 12-31-08 CIVIL STATE OF CALIFORNIA

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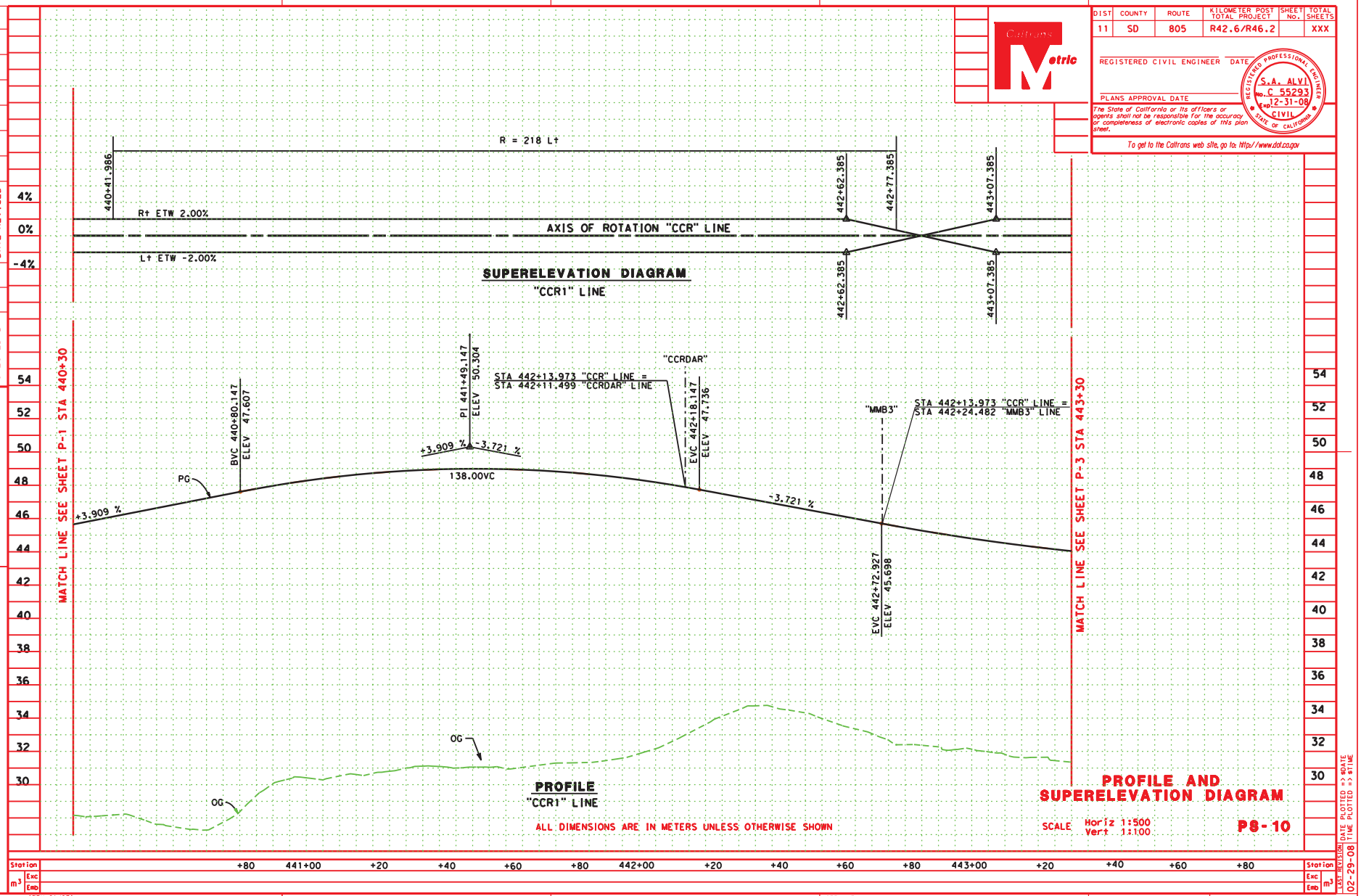

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER S.A. ALVI

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DATE REVISED BY

DATE REVISED

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EA 2T0401

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REGISTERED CIVIL ENGINEER DATE

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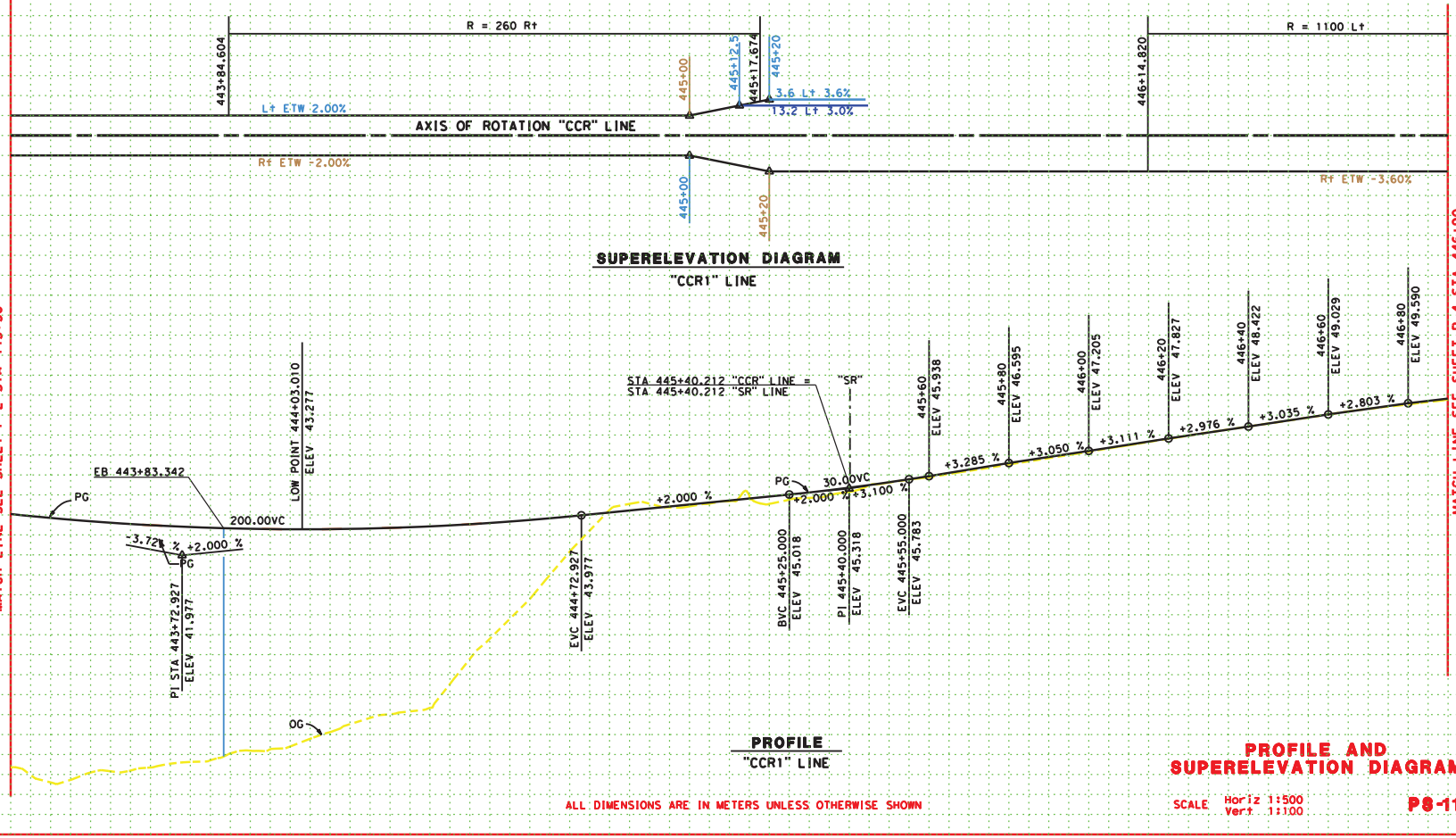
Caltrans Metric



PROFILE
"CCR1" LINE

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

PROFILE AND SUPERELEVATION DIAGRAM

SCALE Horiz 1:500 Vert 1:100

P8-11

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans PROJECT DEVELOPMENT

PROJECT ENGINEER S.A. ALVI

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DATE REVISED

DATE

LAST REVISION 02-29-08

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TIME PLOTTED => $TIME

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REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER S.A. ALVI No. C 55293 12-31-08 CIVIL STATE OF CALIFORNIA

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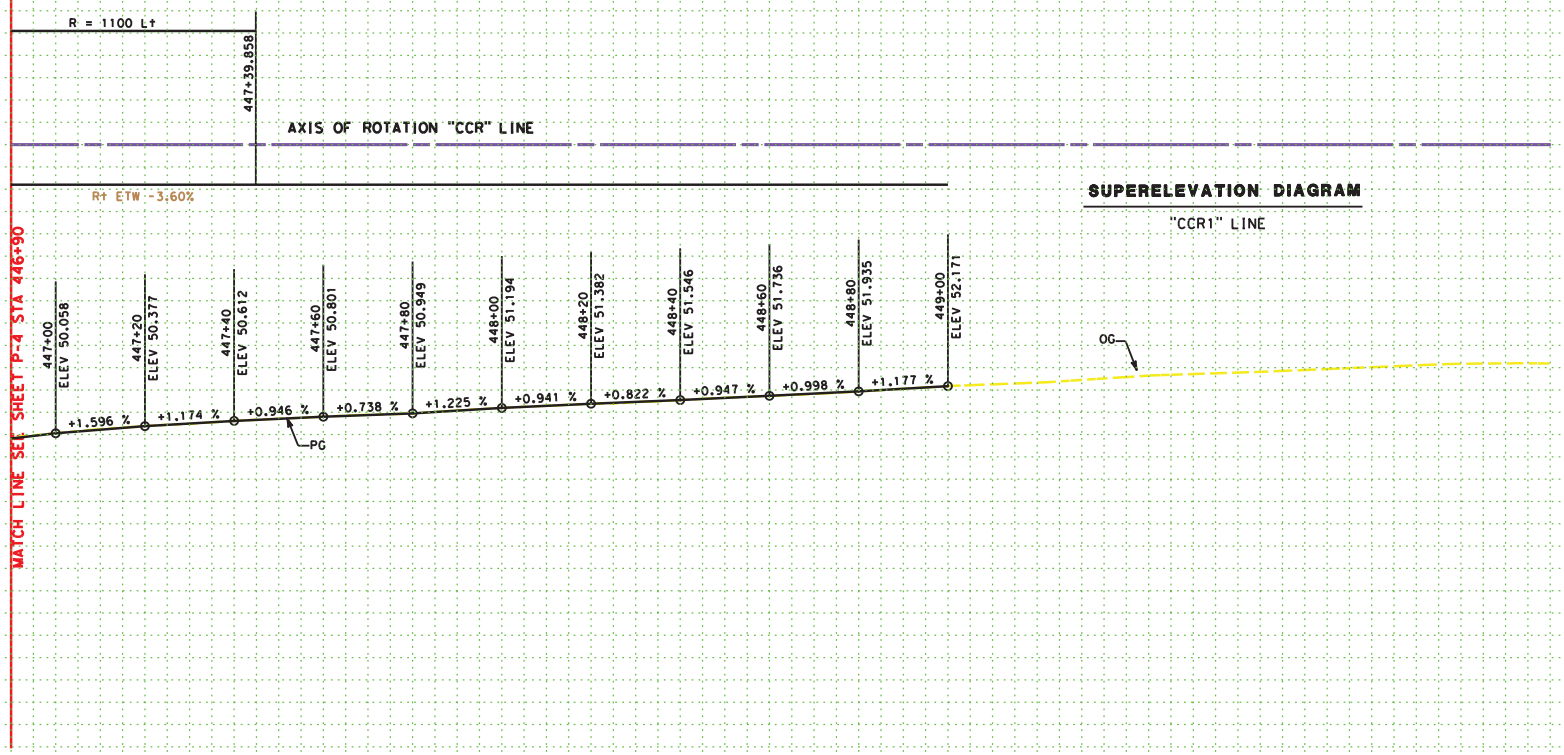
Caltrans Metric



SUPERELEVATION DIAGRAM

"CCR1" LINE

PROFILE

"CCR1" LINE

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

Station	447+00	+20	+40	+60	+80	448+00	+20	+40	+60	+80	449+00
m^3 Exc											
m^3 Emb											

PROFILE AND SUPERELEVATION DIAGRAM

SCALE Horiz 1:500 Vert 1:1.00

P8-12

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CU 11275

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REGISTERED CIVIL ENGINEER DATE

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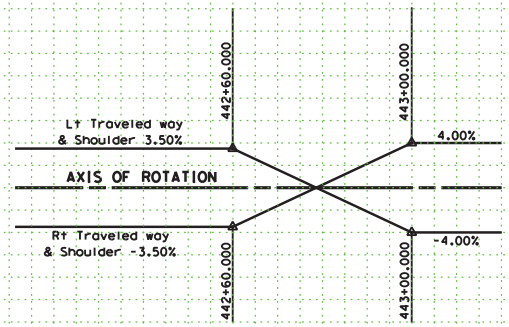
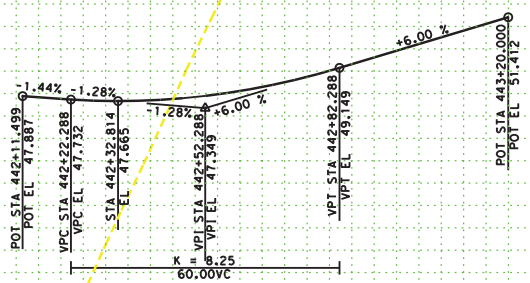


SUPERELEVATION
"CCRDAR1" LINE



PROFILE
"CCRDAR1" LINE

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

PROFILE AND SUPERELEVATION DIAGRAM

SCALE Horiz 1:500
Vert 1:100

P8-13

Station	442+00	+20	+40	+60	+80	443+00	+20	+40
m³ Exc								
m³ Emb								

4% 0% -4% 54 52 50 48 46 44 42 40

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Caltrans PROJECT DEVELOPMENT

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CU 11275 | EA 2T0401

LAST REVISION 02-29-08 DATE PLOTTED => $DATE TIME PLOTTED => $TIME

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11	SD	805	R42.6/R46.2		XXX

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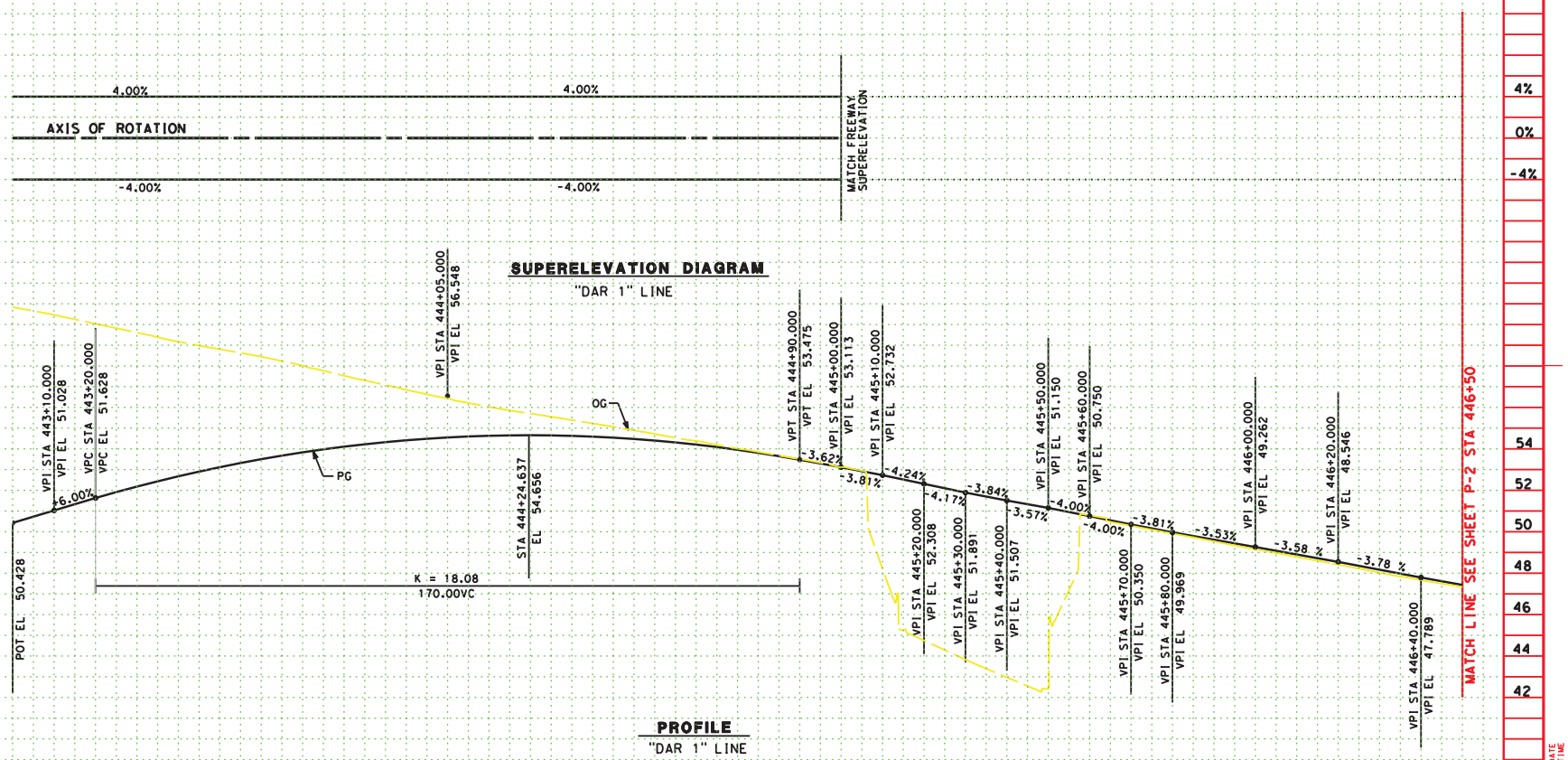

PROFILE AND SUPERELEVATION DIAGRAM

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE Horiz 1:500 Vert 1:100

P8-14

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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CU 11275

EA 2T0401

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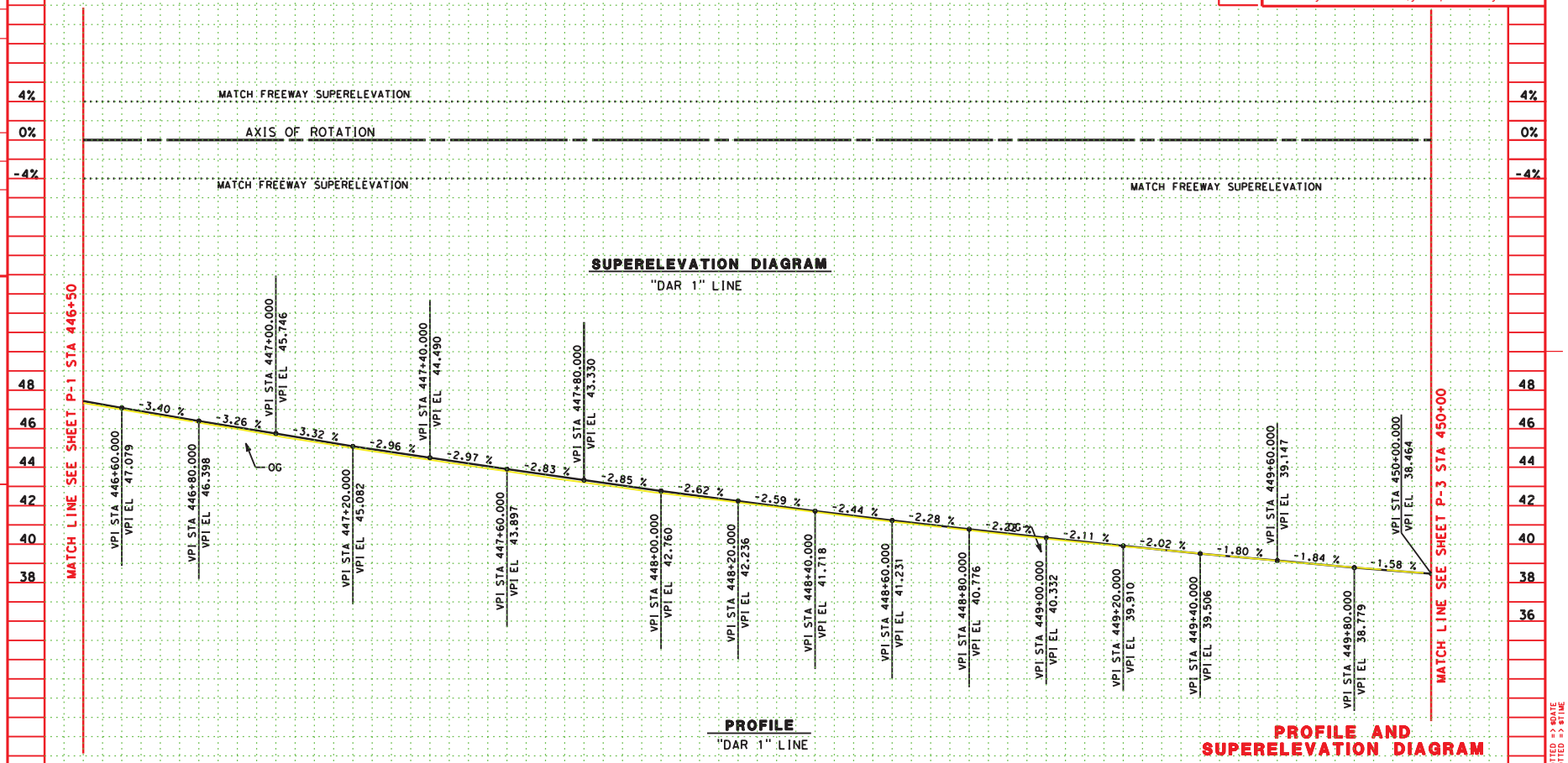

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE Horiz 1:500 Vert 1:100

PROFILE AND SUPERELEVATION DIAGRAM

P8-15

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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TIME PLOTTED => $TIME

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CU 11275

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Caltrans Metric

MATCH FREEWAY SUPERELEVATION

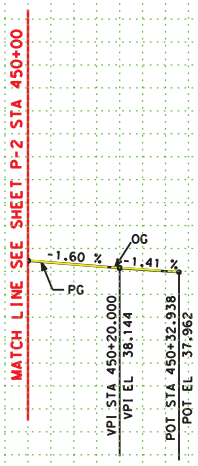
AXIS OF ROTATION

MATCH FREEWAY SUPERELEVATION

4%
0%
-4%

SUPERELEVATION DIAGRAM

"DAR 1" LINE



42
40
38
36
34

PROFILE

"DAR 1" LINE

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

PROFILE AND SUPERELEVATION DIAGRAM

SCALE Horiz 1:500 Vert 1:100

PS-16

Station		+80	450+00	+20	+40	+60	Station
m^3	Exc						Exc
	Emb						Emb m^3

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PROJECT ENGINEER S.A. ALVI

CALCULATED/DESIGNED BY | CHECKED BY

DATE REVISED BY | DATE REVISED

LAST REVISION 02-29-08 DATE PLOTTED => $DATE TIME PLOTTED => $TIME

FORM - - - (REV.01/07)

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CU 11275

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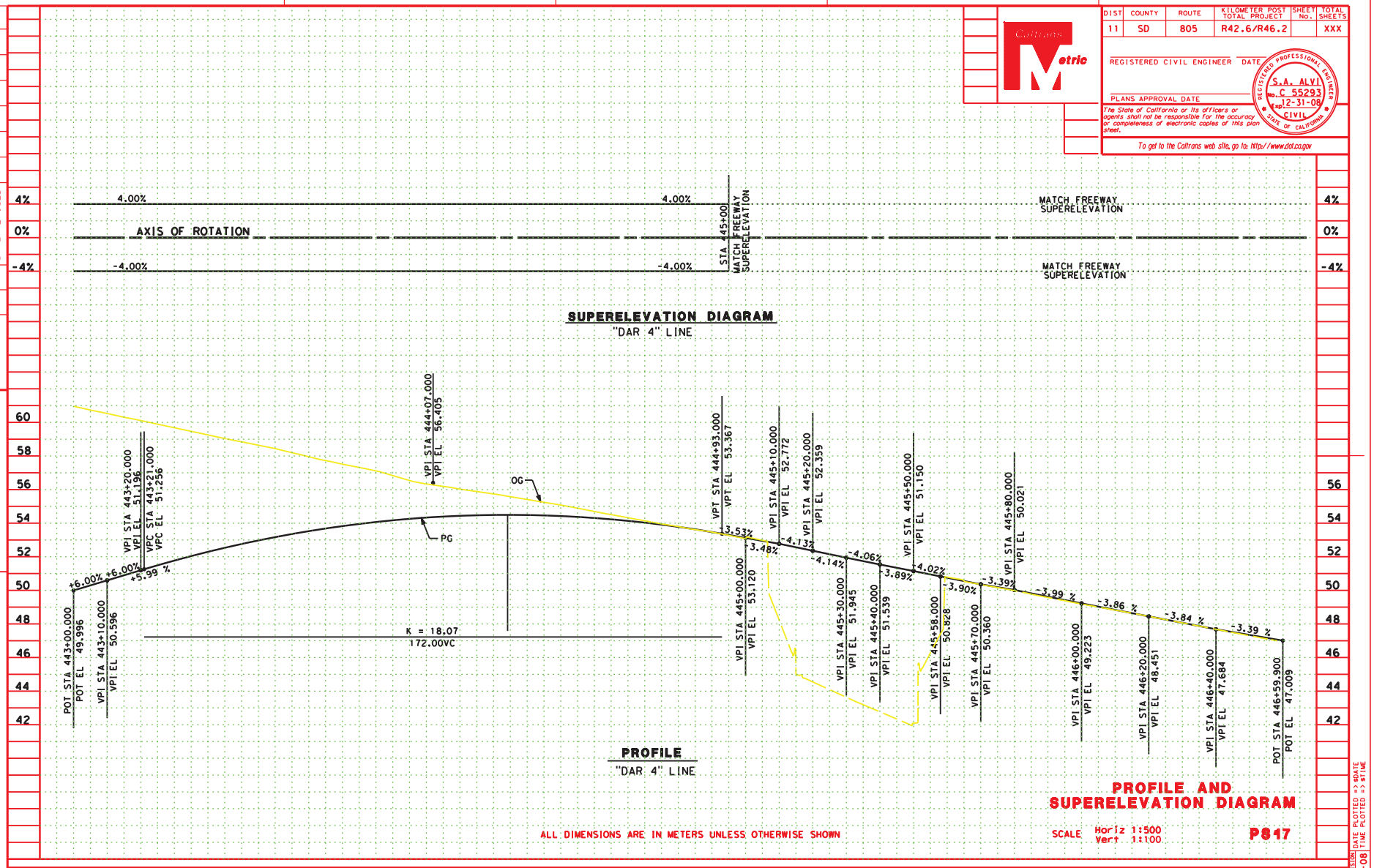

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE Horiz 1:500 Vert 1:100

PROFILE AND SUPERELEVATION DIAGRAM

P817

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CU 11275

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11	SD	805	R42.6/R46.2		XXX

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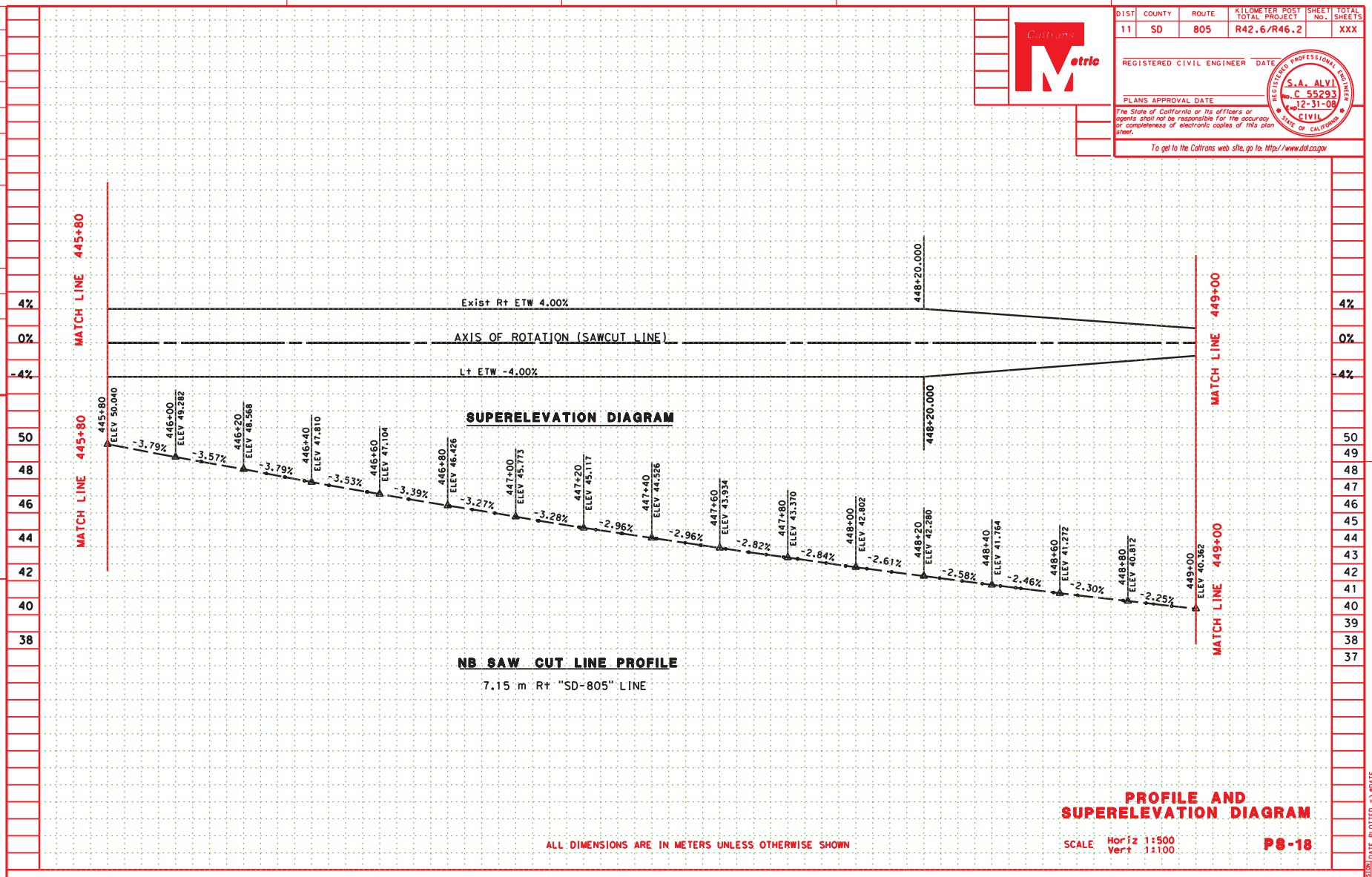

NB SAW CUT LINE PROFILE

7.15 m Rt "SD-805" LINE

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE Horiz 1:500 Vert 1:100

PROFILE AND SUPERELEVATION DIAGRAM

P8-18

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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CU 11275

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11	SD	805	R42.6/R46.2		XXX

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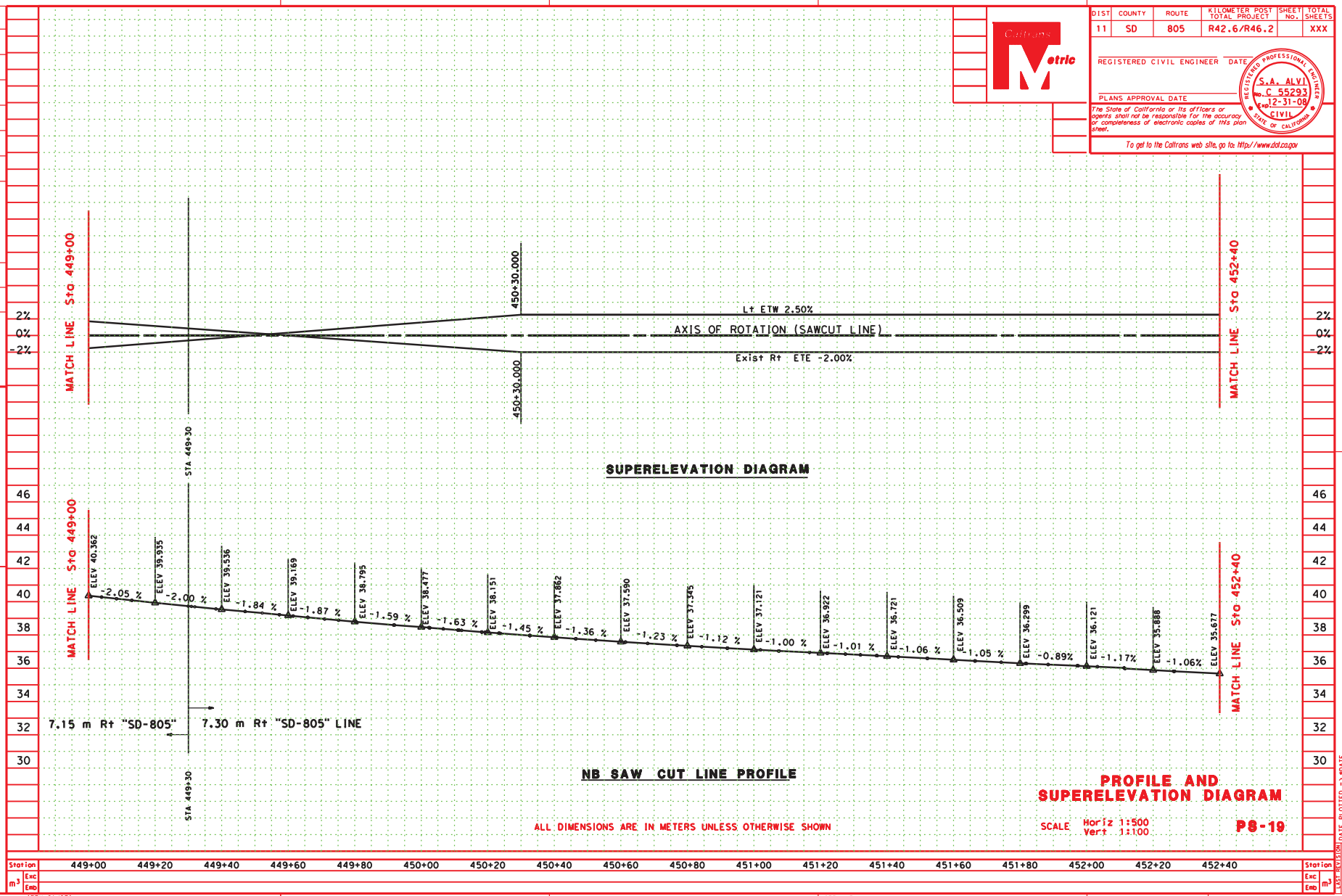

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE Horiz 1:500 Vert 1:100

PROFILE AND SUPERELEVATION DIAGRAM

PS-19

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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11	SD	805	R42.6/R46.2		XXX

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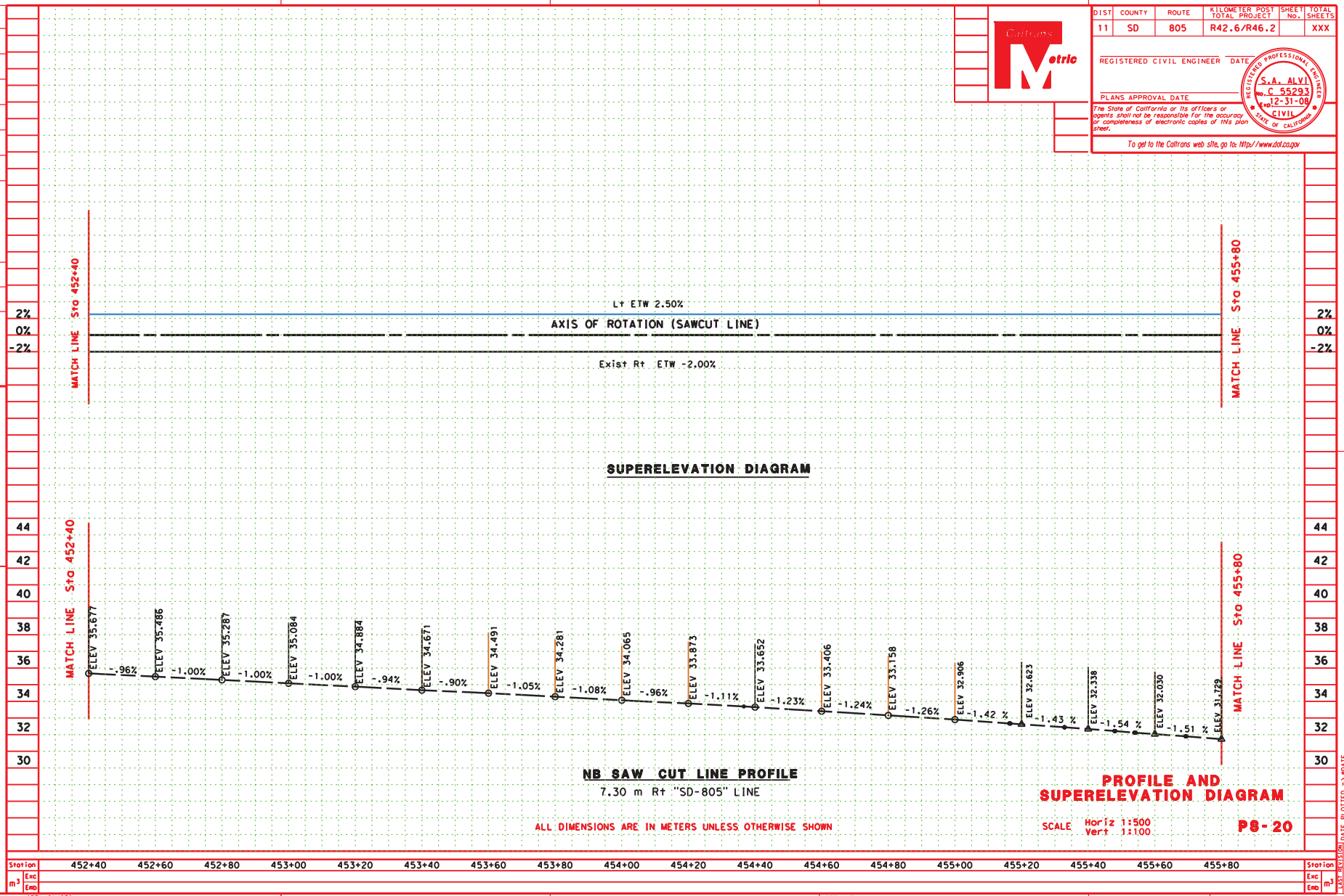
Caltrans Metric



SCALE Horiz 1:500 Vert 1:100

PROFILE AND SUPERELEVATION DIAGRAM

P8-20

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans **PROJECT DEVELOPMENT**

PROJECT ENGINEER **S.A. ALVI**

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CU 11275

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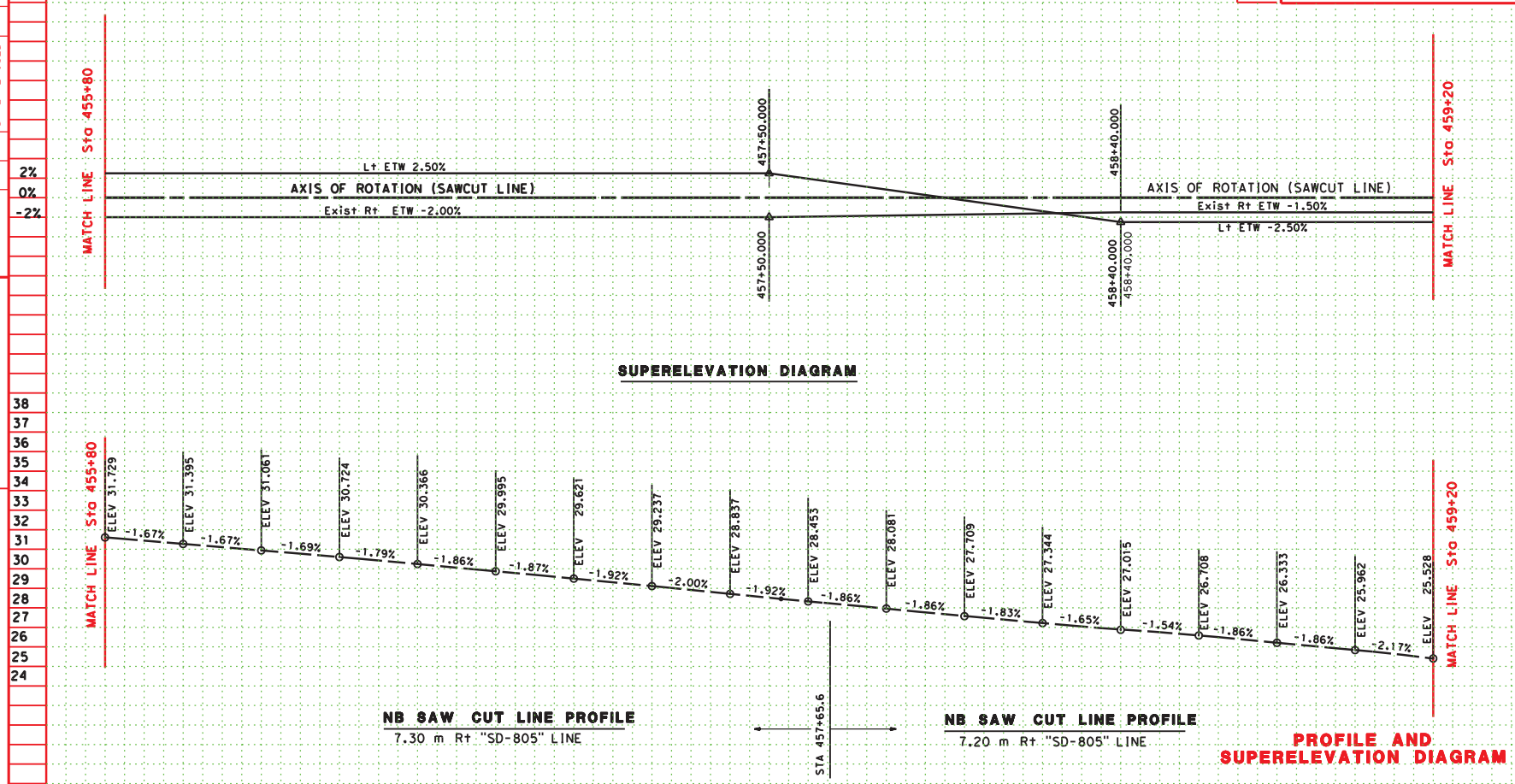

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE Horiz 1:500 Vert 1:100

PROFILE AND SUPERELEVATION DIAGRAM

PS-21

Station	455+80	456+00	456+20	456+40	456+60	456+80	457+00	457+20	457+40	457+60	457+80	458+00	458+20	458+40	458+60	458+80	459+00	459+20
m^3 Exc																		
m^3 Emb																		

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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CU 11275

EA 2T0401

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11	SD	805	R42.6/R46.2		XXX

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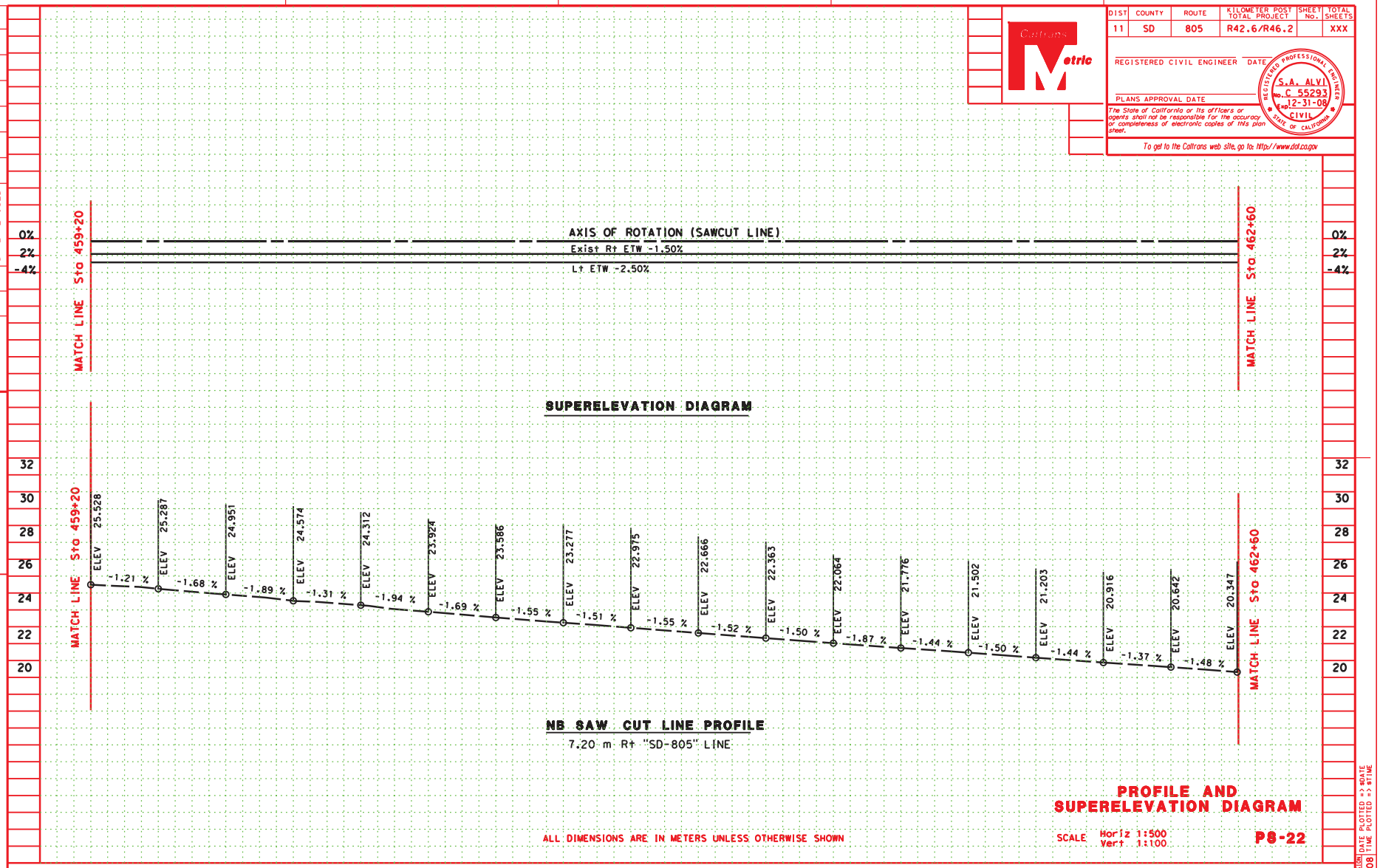

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE Horiz 1:500 Vert 1:100

PROFILE AND SUPERELEVATION DIAGRAM

PS-22

Station	459+20	459+40	459+60	459+80	460+00	460+20	460+40	460+60	460+80	461+00	461+20	461+40	461+60	461+80	462+00	462+20	462+40	462+60
m^3 Exc																		
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11	SD	805	R42.6/R46.2		XXX

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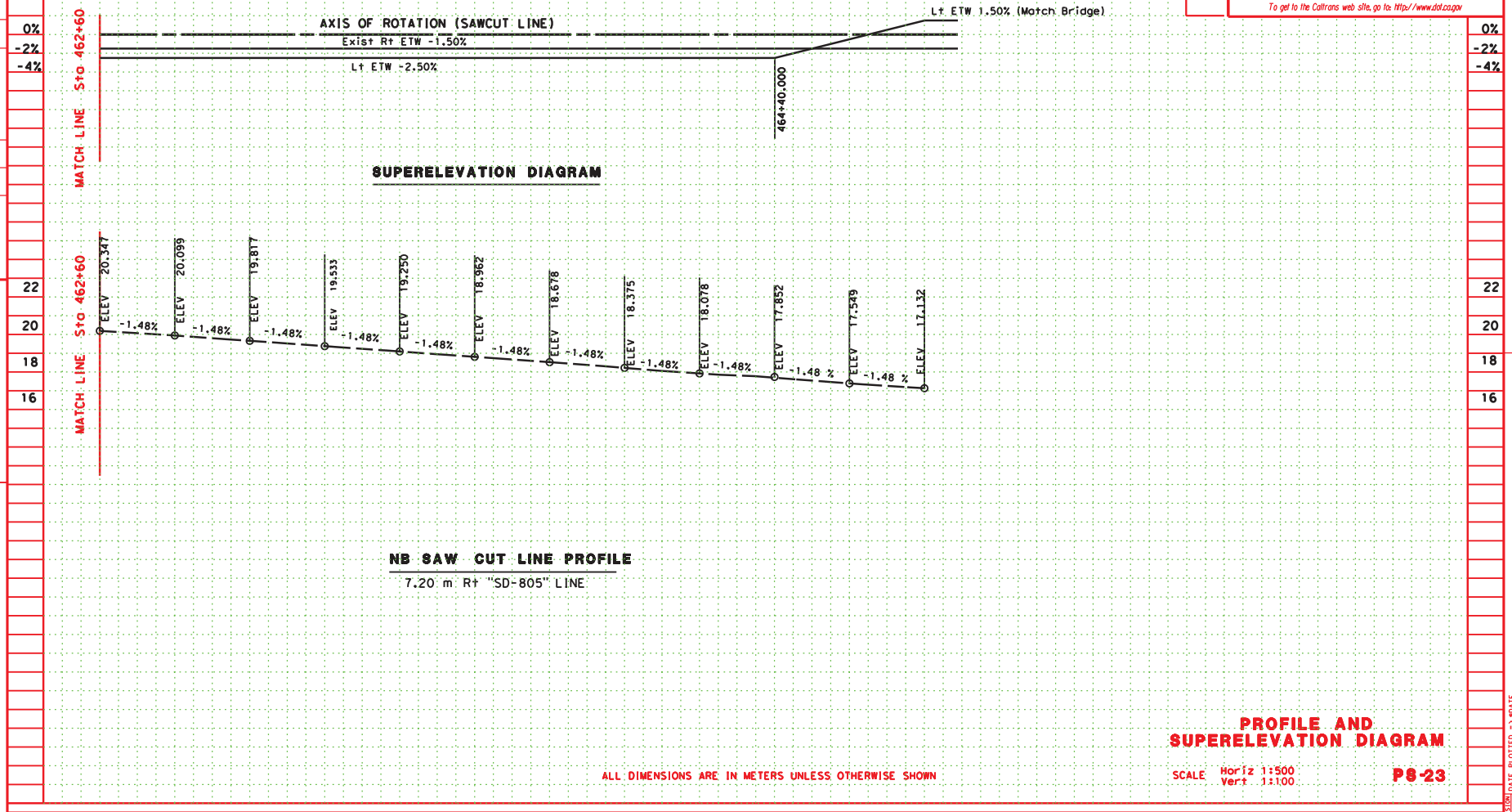

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SCALE Horiz 1:500 Vert 1:100

PROFILE AND SUPERELEVATION DIAGRAM

PS-23

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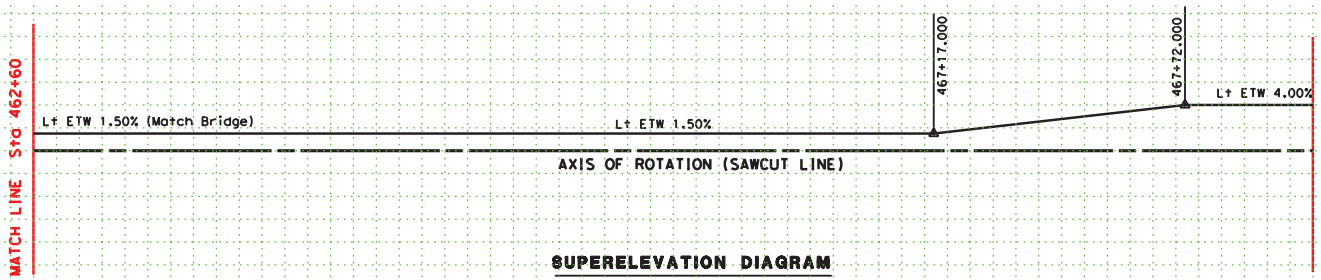
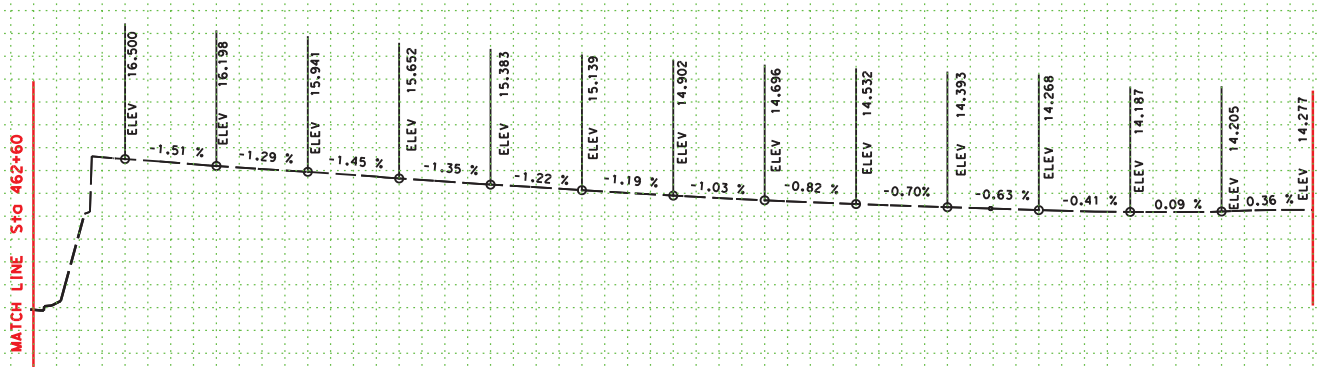


SUPERELEVATION DIAGRAM



NB SAW CUT LINE PROFILE

0.20 m Rt "AR" LINE

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

PROFILE AND SUPERELEVATION DIAGRAM

SCALE Horiz 1:500 Vert 1:100

PS-24

Station	464+80	465+00	465+20	465+40	465+60	465+80	466+00	466+20	466+40	466+60	466+80	467+00	467+20	467+40	467+60	467+80	468+00	468+20
m^3 Exc																		
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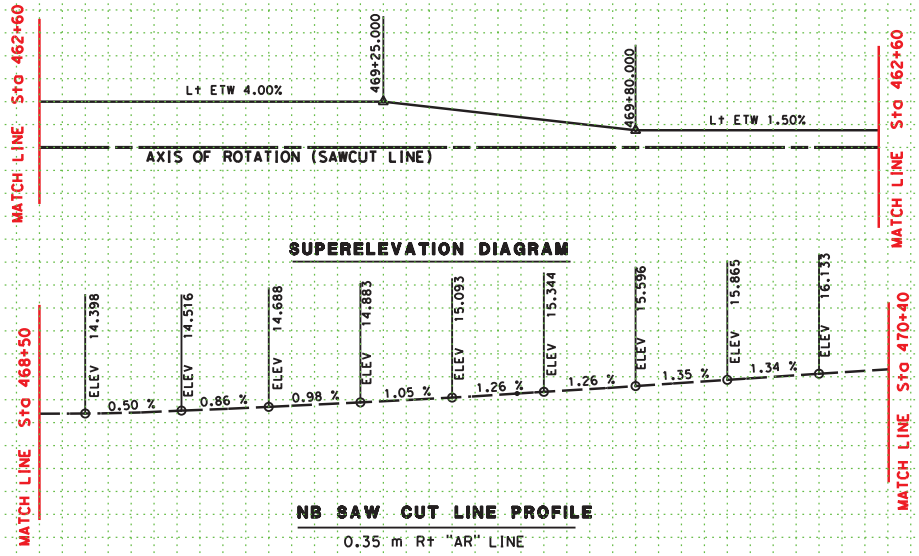

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PROFILE AND SUPERELEVATION DIAGRAM

SCALE Horiz 1:500 Vert 1:100

PS-25

Station	468+40	468+60	468+80	469+00	469+20	469+40	469+60	469+80	470+00	470+20	470+40
m^3 Exc											
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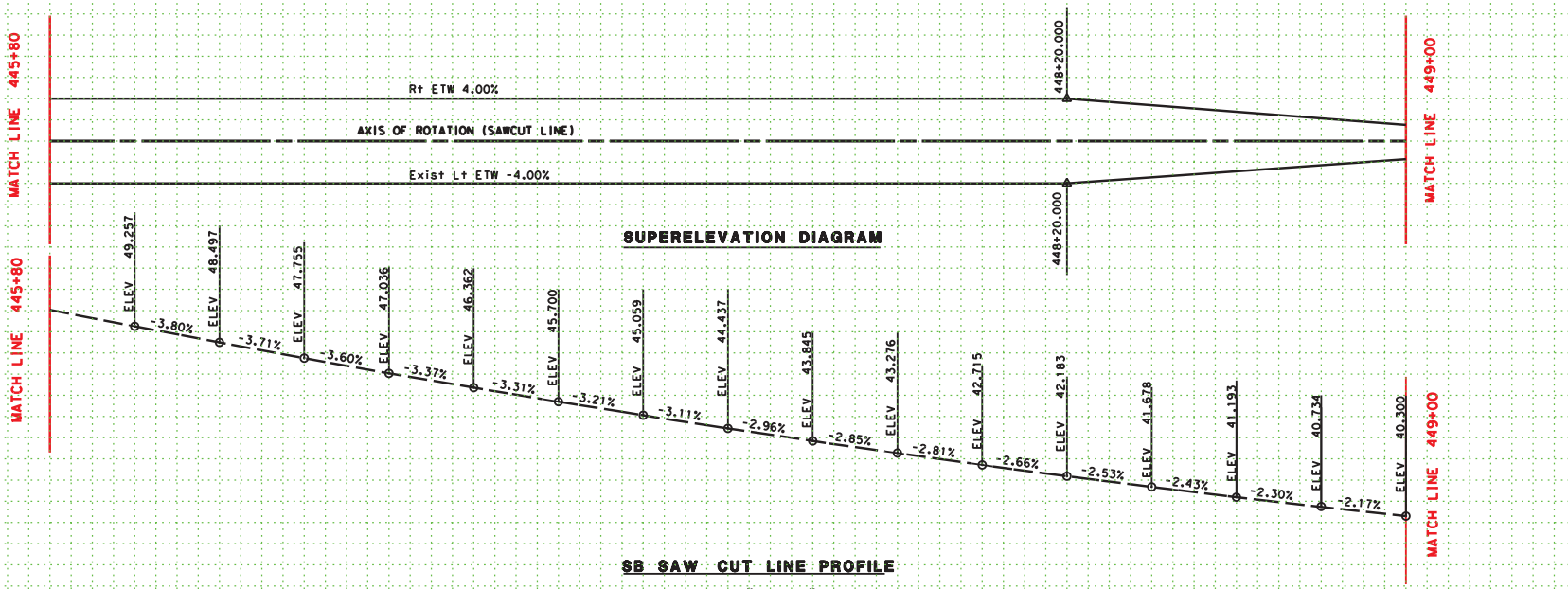

SUPERELEVATION DIAGRAM

SB SAW CUT LINE PROFILE

7.30 m Lt "SD-805" LINE

7.20 m Lt "SD-805" LINE AFTER STA 448+46.743

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

PROFILE AND SUPERELEVATION DIAGRAM

SCALE Horiz 1:500 Vert 1:100

P8-26

Station	445+80	446+00	446+20	446+40	446+60	446+80	447+00	447+20	447+40	447+60	447+80	448+00	448+20	448+40	448+60	448+80	449+00
m^3 Exc																	
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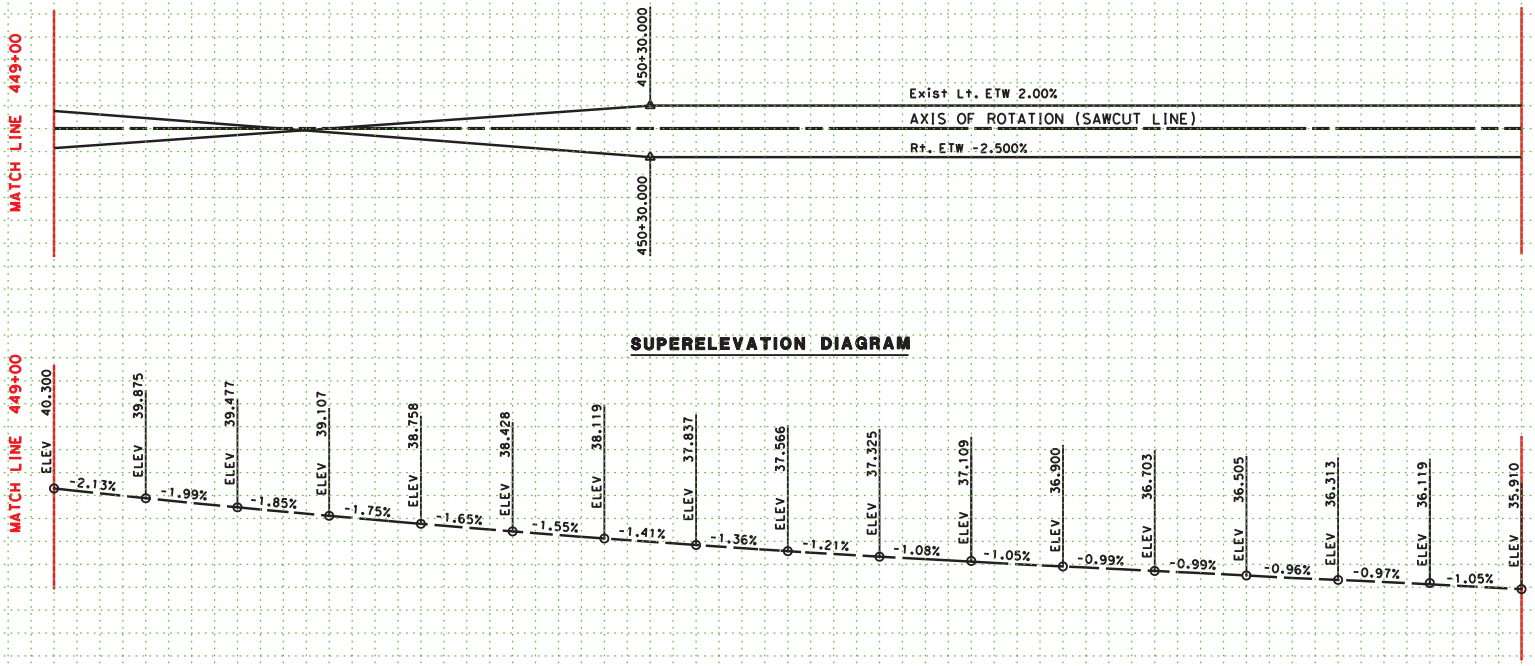

SUPERELEVATION DIAGRAM

SB SAW CUT LINE PROFILE

7.20 m Lt "SD-805" LINE

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE Horiz 1:500 Vert 1:100

PROFILE AND SUPERELEVATION DIAGRAM

P8-27

Station	449+00	449+20	449+40	449+60	449+80	450+00	450+20	450+40	450+60	450+80	451+00	451+20	451+40	451+60	451+80	452+00	452+20
m^3 Exc																	
m^3 Emb																	

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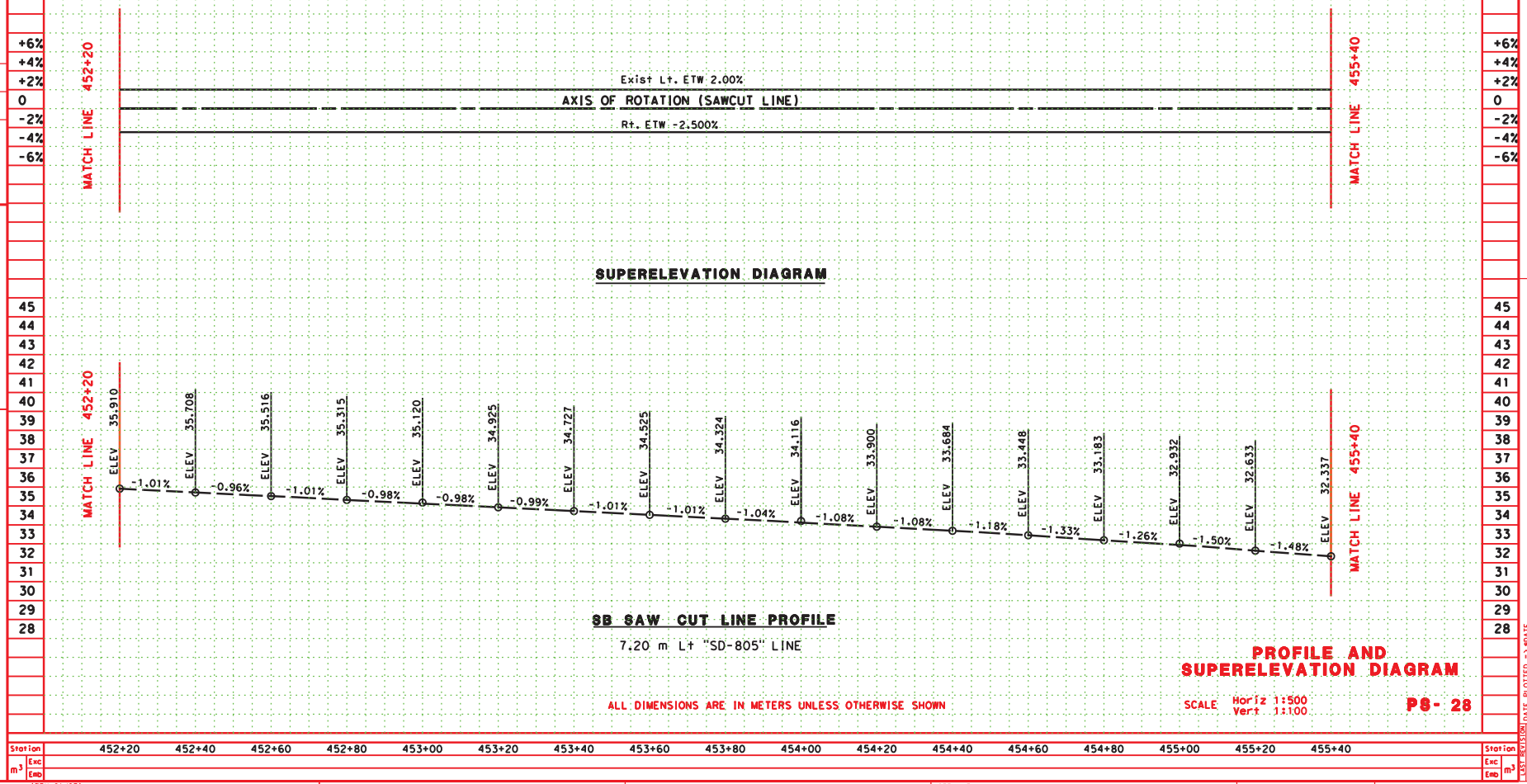

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE Horiz 1:500 Vert 1:100

PROFILE AND SUPERELEVATION DIAGRAM

P8- 28

Station	452+20	452+40	452+60	452+80	453+00	453+20	453+40	453+60	453+80	454+00	454+20	454+40	454+60	454+80	455+00	455+20	455+40
m^3 Exc																	
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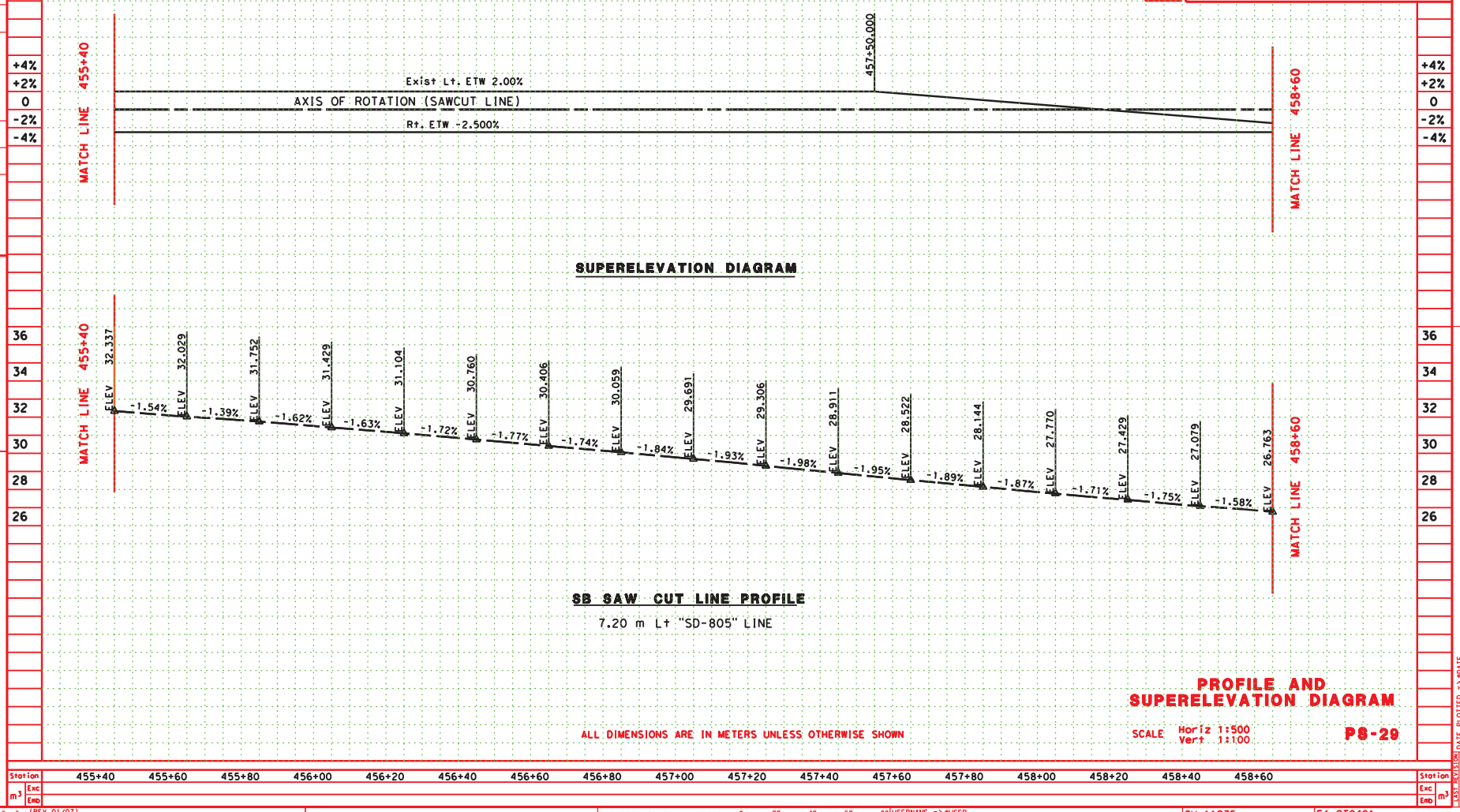

PROFILE AND SUPERELEVATION DIAGRAM

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE Horiz 1:500 Vert 1:100

P8-29

Station	455+40	455+60	455+80	456+00	456+20	456+40	456+60	456+80	457+00	457+20	457+40	457+60	457+80	458+00	458+20	458+40	458+60
m^3 Exc																	
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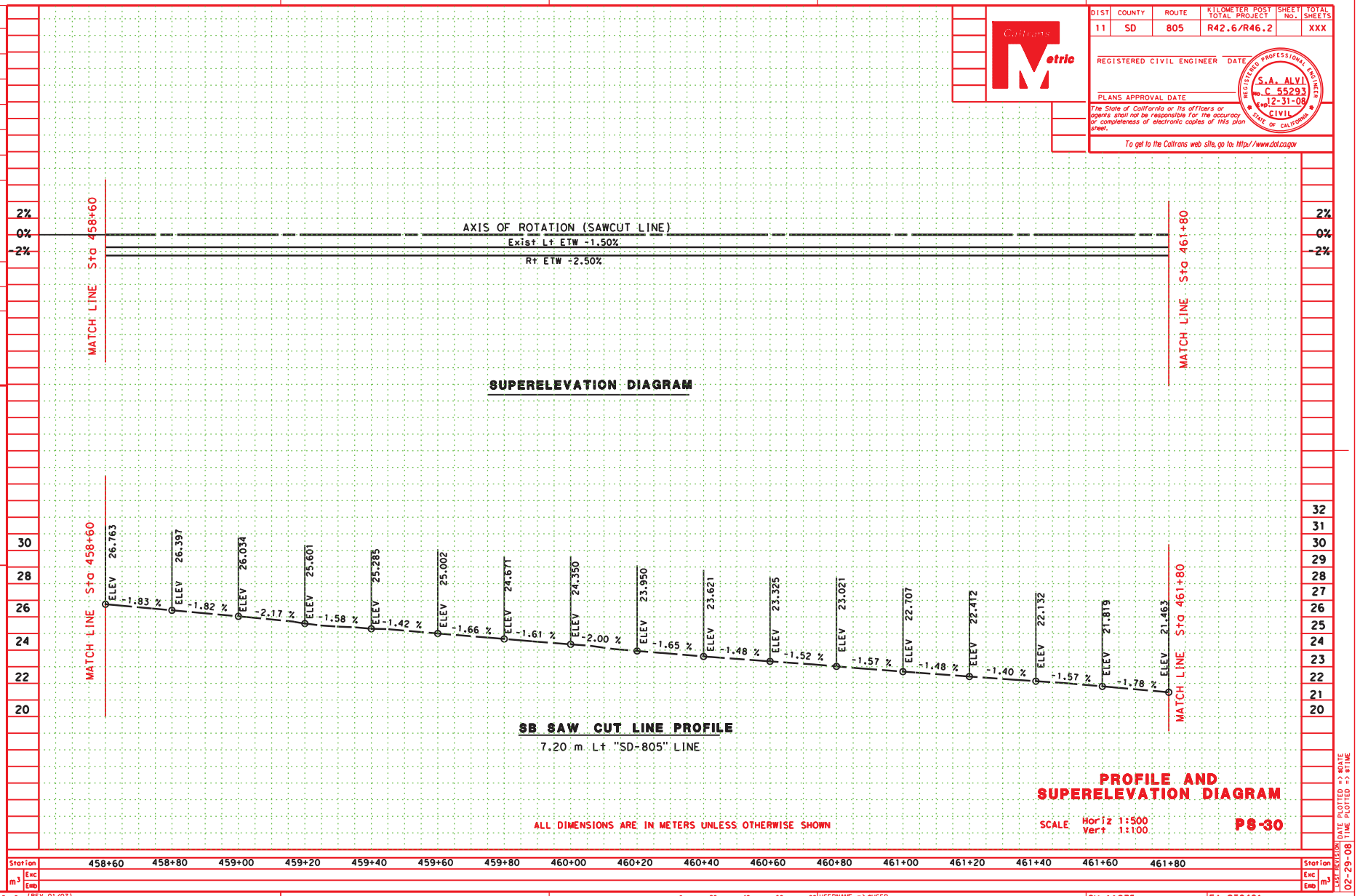

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SCALE Horiz 1:500 Vert 1:100

PROFILE AND SUPERELEVATION DIAGRAM

PS-30

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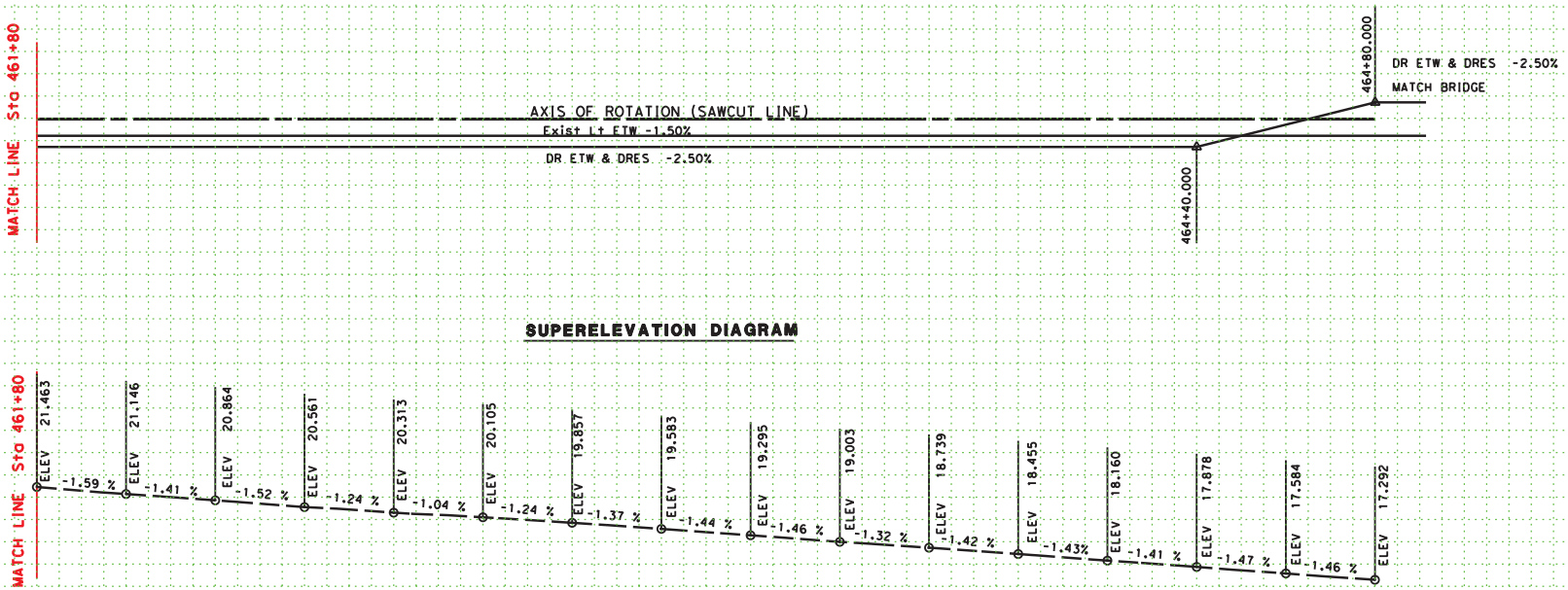

SUPERELEVATION DIAGRAM

SB SAW CUT LINE PROFILE

7.20 m Lt "SD-805" LINE

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

SCALE Horiz 1:500 Vert 1:100

PROFILE AND SUPERELEVATION DIAGRAM

P8- 31

Station	461+80	462+00	462+20	462+40	462+60	462+80	463+00	463+20	463+40	463+60	463+80	464+00	464+20	464+40	464+60	464+80
m^3 Exc																
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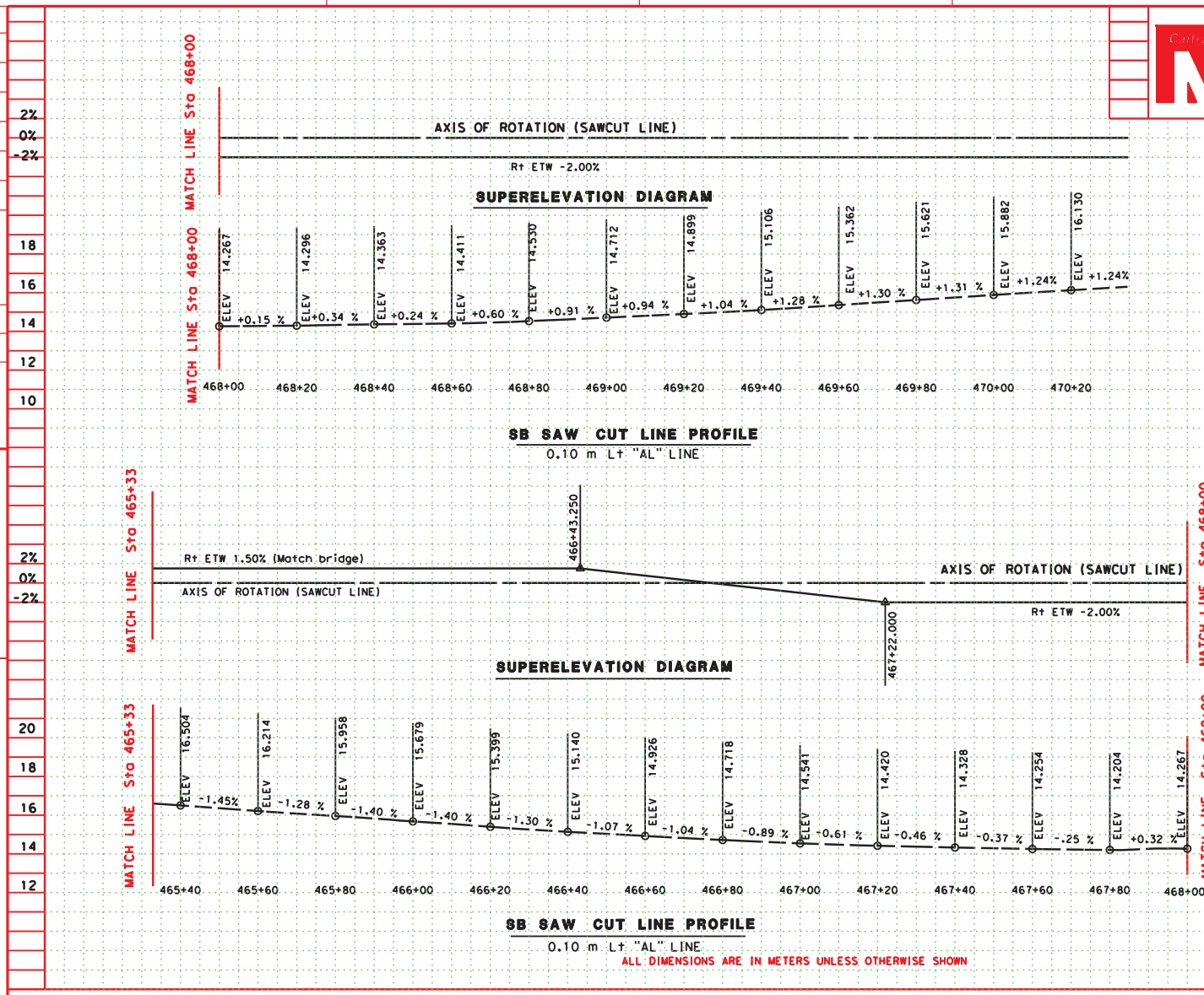

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

PROFILE AND SUPERELEVATION DIAGRAM

SCALE Horiz 1:500 Vert 1:100

P8-32

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Attachment H
Traffic Study

LINSCOTT
LAW &
GREENSPAN
engineers

TRAFFIC EVALUATION REPORT

I-805/MIRA MESA BOULEVARD / SORRENTO VALLEY ROAD INTERCHANGE

San Diego, California
November 25, 2008

LLG Ref. 3-05-1552

Prepared by:
Kalyan Yellapu
Transportation Engineer II

Under the Supervision of:
John Boarman, P.E
Principal

Linscott, Law & Greenspan, Engineers
4542 Ruffner Street
Suite 100
San Diego, CA 92111
858.300.8800 T
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www.llgengineers.com

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C.	Signal Timing, Signal Design, Ramp Meter Information, Community Plan and Definitions
D.	Existing Signalized Intersection HCM Calculation Sheets
E.	Existing Signalized Intersection Queuing Calculation Worksheets
F.	Existing ILV Analyses Worksheets
G.	Existing Freeway Merge HCM Calculation Sheets
H.	Existing Freeway Diverge HCM Calculation Sheets
I.	LLG Memorandum Regarding Land Use Changes & Forecast Plots
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R.	Year 2010 (with Carroll Cyn Rd Ext) ILV Calculation Worksheets
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W.	Year 2030 (without Carroll Cyn Rd Ext) ILV Calculation Worksheets
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Y.	Year 2030 (without Carroll Cyn Rd Ext) Freeway Diverge HCM Calculation Sheets
Z.	Year 2030 (with Carroll Cyn Rd Ext) Intersection HCM Calculation Sheets
AA.	Year 2030 (with Carroll Cyn Rd Ext) Intersection Queuing Calculation Worksheets
AB.	Year 2030 (with Carroll Cyn Rd Ext) ILV Calculation Worksheets
AC.	Year 2030 (with Carroll Cyn Rd Ext) Freeway Merge HCM Calculation Sheets
AD.	Year 2030 (with Carroll Cyn Rd Ext) Freeway Diverge HCM Calculation Sheets

APPENDICES *(continued)*

APPENDIX

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1B. Alternative 1 - Intersection Queuing Calculation Worksheets

1C. Alternative 1 - ILV Calculation Worksheets

1D. Alternative 1 - Freeway Merge HCM Calculation Sheets

1E. Alternative 1 - Freeway Diverge HCM Calculation Sheets

1F. Alternative 1 - Freeway Weaving Calculation Sheets

2A. Alternative 2 - Intersection HCM Calculation Sheets

2B. Alternative 2 - Intersection Queuing Calculation Worksheets

2C. Alternative 2 - ILV Calculation Worksheets

3A. Alternative 3 - Intersection HCM Calculation Sheets

3B. Alternative 3 - Intersection Queuing Calculation Worksheets

3C. Alternative 3 - ILV Calculation Worksheets

3D. Alternative 3 - Freeway Merge HCM Calculation Sheets

3E. Alternative 3 - Freeway Diverge HCM Calculation Sheets

4A. Year 2010 (with Carroll Cyn Rd Ext with NB DAR's) Intersection HCM Calculation Sheets

4B. Year 2010 (with Carroll Cyn Rd Ext with NB DAR's) Intersection Queuing Sheets

4C. Year 2010 (with Carroll Cyn Rd Ext with NB DAR's) ILV Calculation Worksheets

4D. Year 2010 (with Carroll Cyn Rd Ext with NB DAR's) Freeway Merge Calculation Sheets

4E. Year 2010 (with Carroll Cyn Rd Ext with NB DAR's) Freeway Diverge Calculation Sheets

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TRAFFIC EVALUATION REPORT

I-805/MIRA MESA BOULEVARD/SORRENTO VALLEY ROAD INTERCHANGE

San Diego, California
November 25, 2008

1.0 INTRODUCTION

Linscott, Law & Greenspan Engineers (LLG) has been retained to evaluate the Interstate 805/Mira Mesa Boulevard/Sorrento Valley Road Interchange located in the City of San Diego. *Figure 1-1* shows the general vicinity of the project and *Figure 1-2* shows a more detailed project area map.

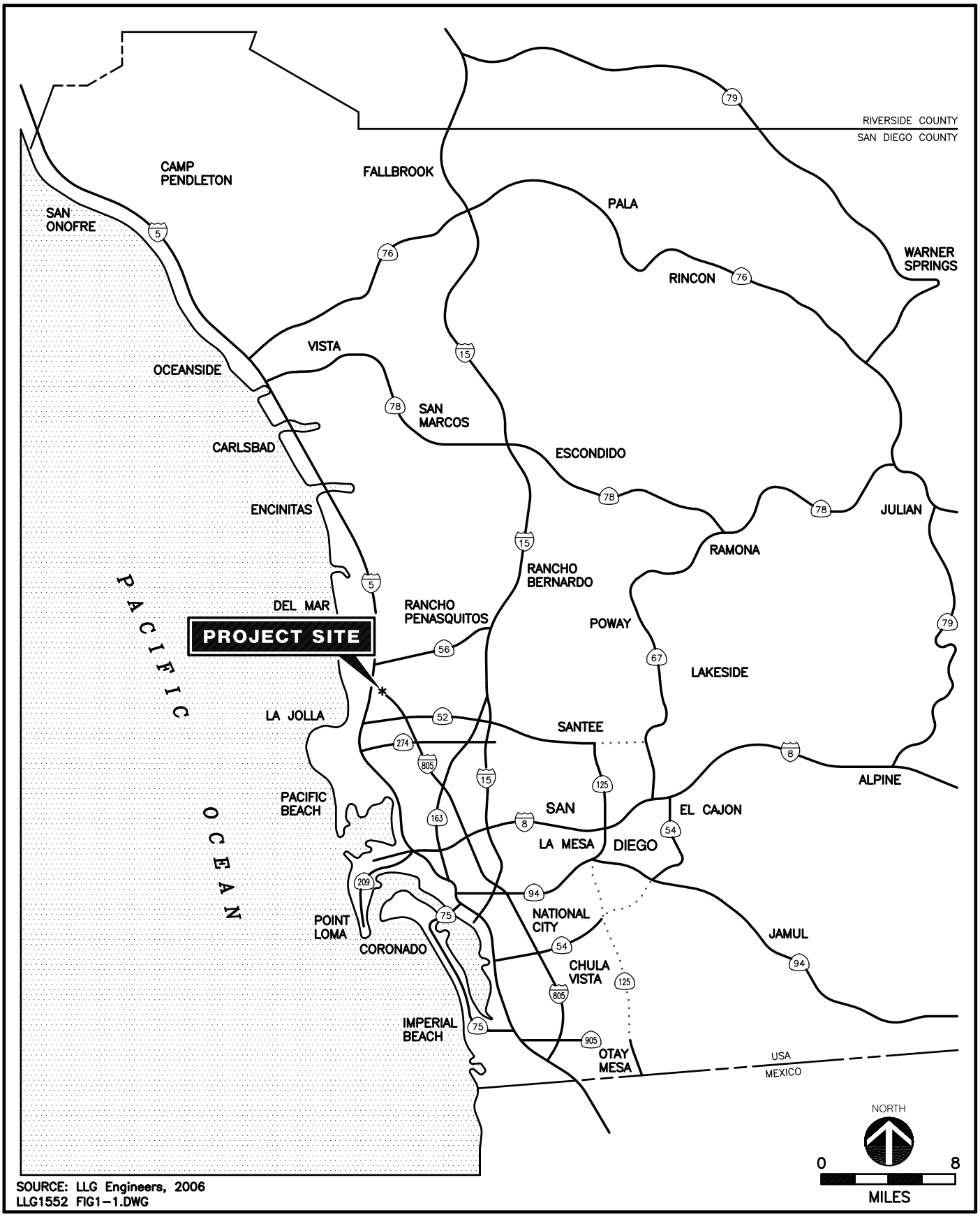
The purpose of this report is to forecast and analyze the future Year 2010, 2030 and project alternatives traffic conditions. Analysis for the Report is based on the approved Traffic Forecast Volumes Report dated September 21, 2005 and the approved Traffic Operations Report dated January 25, 2006. This Report will evaluate potential interchange alternatives as indicated in the Project Study Report (PSR).

The following items are included in this report:

- Study Area;
- Existing Traffic and Operational Assessment;
- Future Year 2010 (without Carroll Cyn Rd Connection) Traffic and Operational Assessment;
- Future Year 2010 (with Carroll Cyn Rd Connection) Traffic and Operational Assessment;
- Future Year 2030 (without Carroll Cyn Rd Connection) Traffic and Operational Assessment;
- Future Year 2030 (with Carroll Cyn Rd Connection) Traffic and Operational Assessment;
- PSR Interchange Alternative 1 (New I-805 Northbound Off-Ramp to Carroll Cyn Rd) Traffic and Operational Assessment;
- PSR Interchange Alternative 2 (Local Improvements) Traffic and Operational Assessment;
- PSR Interchange Alternative 3 (New Coaster Station/BRTC/Carroll Cyn Rd DAR) Traffic and Operational Assessment;

1.1 Study Area

The study area for this project encompasses the potential area, which could be affected by improvements to the subject interchange. The scope of the study area was developed in coordination with the City of San Diego and The Department of Transportation, and LLG's working knowledge of the local transportation system.



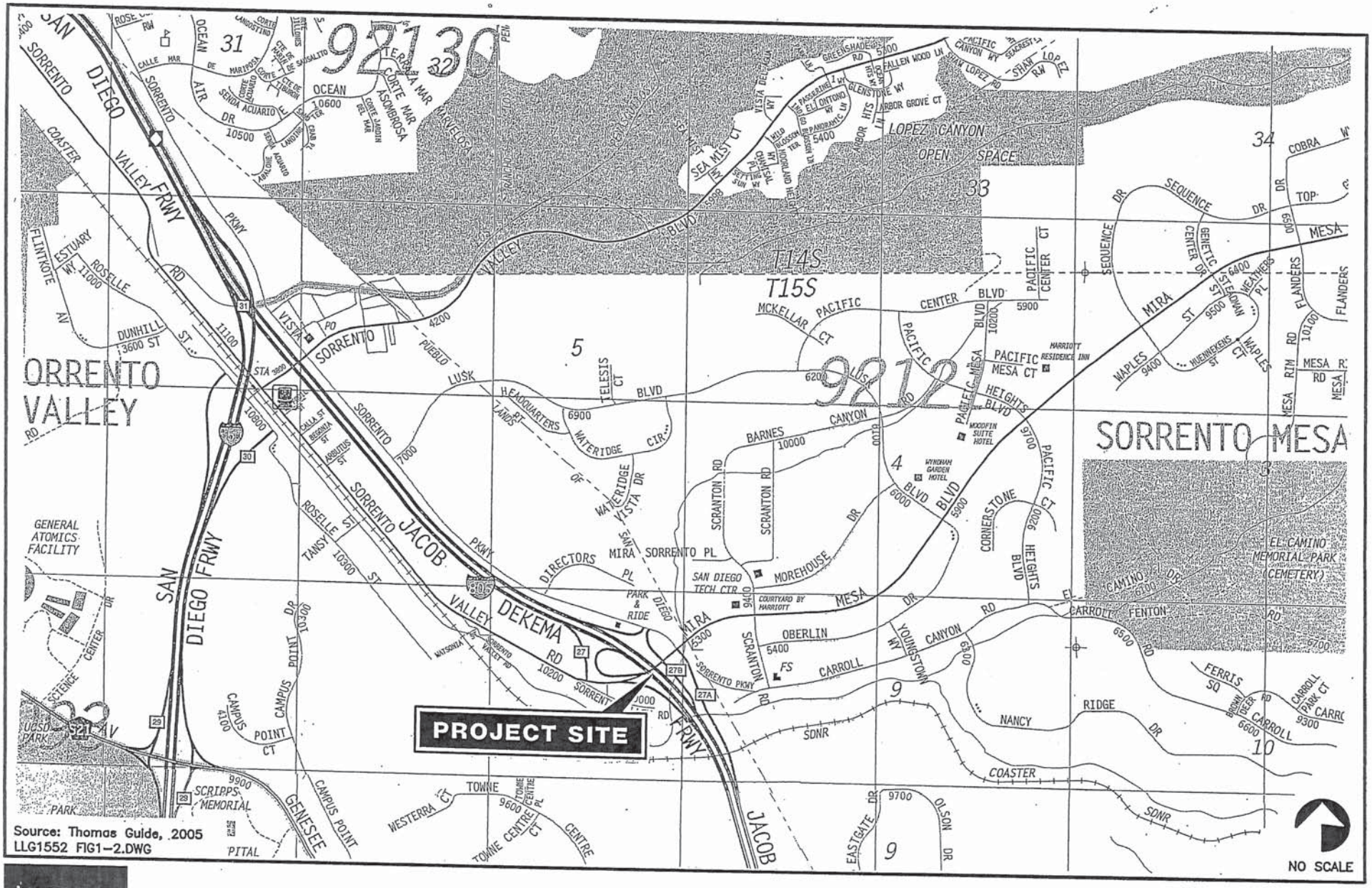
SOURCE: LLG Engineers, 2006
LLG1552 FIG1-1.DWG

LINSCOTT LAW & GREENSPAN engineers

Figure 1-1

Vicinity Map

I-805/Mira Mesa Blvd/
Sorrento Valley Rd Interchange



Source: Thomas Guide, 2005
LLG1552 FIG1-2.DWG

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Figure 1-2

Project Area Map

I-805/MIRA MESA BLVD/SORRENTO VALLEY RD INTERCHANGE

Based on this criteria, the following intersections, segments, ramps and freeway mainline locations were specifically analyzed in this study.

Intersections

- Sorrento Valley Road/I-805 Southbound off-ramp
- Mira Mesa Boulevard/Vista Sorrento Parkway/I-805 Northbound off-ramp
- Mira Mesa Boulevard/Scranton Road
- Mira Mesa Boulevard/Lusk Boulevard
- Mira Mesa Boulevard/Pacific Heights Boulevard
- Scranton Road/Mira Sorrento Place
- Scranton Road/Morehouse Drive
- Scranton Road /Oberlin Drive
- Scranton Road /Carroll Canyon Road
- Vista Sorrento Parkway/ I-805 Northbound Ramps
- Vista Sorrento Parkway/ Lusk Boulevard*
- Vista Sorrento Parkway/Sorrento Valley Boulevard*
- Sorrento Valley Road/ Sorrento Valley Boulevard*

* Only general assessment was performed due to proximity to subject interchange (i.e. operational analysis were not conducted)

Segments

- **Mira Mesa Boulevard**
  - I-805 Southbound On-ramp to Vista Sorrento Parkway
  - Vista Sorrento Parkway to Scranton Road
  - Scranton Road to Lusk Boulevard

- **Sorrento Valley Road**
  - North of I-805 Southbound Off-ramp
  - I-805 Southbound Off-ramp to I-805 Southbound On-ramp

- **Vista Sorrento Parkway**
  - I-805 Northbound ramps to Lusk Boulevard
  - Mira Mesa Boulevard to I-805 Northbound ramps

- **Scranton Road**
  - Mira Sorrento Place to Morehouse Drive
  - Morehouse Drive to Mira Mesa Boulevard
  - Mira Mesa Boulevard to Oberlin Drive
  - Oberlin Drive to Carroll Canyon Road

- **Carroll Canyon Road**
  - East of Scranton Road

Ramps

- **I-805/Mira Mesa Boulevard/Sorrento Valley Road**
  - I-805 Southbound Off-ramp to Sorrento Valley Road
  - I-805 Southbound On-ramp from Sorrento Valley Road
  - I-805 Southbound On-ramp from Mira Mesa Boulevard
  - I-805 Northbound Off-ramp to Mira Mesa Boulevard

- **I-805/Vista Sorrento Parkway**
  - I-805 Northbound Off-ramp to Vista Sorrento Parkway
  - I-805 Northbound On-ramp from Vista Sorrento Parkway

Freeway

- I-805 (North Of I-805/Mira Mesa Boulevard/Sorrento Valley Road Interchange)
- I-805 (South Of I-805/Mira Mesa Boulevard/Sorrento Valley Road Interchange)

2.0 EXISTING CONDITIONS

Effective evaluation of the traffic operations requires an understanding of the existing transportation system in the project study area. Existing transportation conditions in the study area include roadway geometries, traffic control, and peak period/daily traffic flow.

2.1 Street Network

The principal roadways in the project study area are described briefly below. The description includes the physical characteristics, adjacent land uses, and intersection traffic control. *Figure 2-1* illustrates existing transportation conditions.

Mira Mesa Boulevard is classified as a six-lane Primary Arterial, except between Scranton Drive and I-805 northbound ramps, where it is classified as a eight-lane Primary Arterial. Currently, Mira Mesa Boulevard is a six lane east-west roadway, with the western section at Scranton Road, providing eight lanes of travel. Mira Mesa Boulevard is under City of San Diego jurisdiction throughout the study area with the exception of the I-805 Interchange which is operated by Caltrans. The posted speed limit ranges from 45 to 50 mph. Land uses in the vicinity of the roadway are a mix of office and some commercial. Based on the San Diego's Region Bike Map, Mira Mesa Blvd is currently classified as a Class II Bicycle Lane in each direction. However it becomes a Class III Bicycle Route through the I-805 interchange.

Lusk Boulevard is classified as a Four-Lane Collector Road between Mira Mesa Boulevard and Vista Sorrento Parkway in the Mira Mesa Community Plan, City of San Diego. It is currently built to this classification. The posted speed limit is 45 mph. Curbside parking is generally prohibited. Based on the San Diego's Region Bike Map, Lusk Blvd currently does not contain a bikeway. However it is proposed to have either a Class II Bicycle Lane or Class II Bicycle Route as per the 2002 City of San Diego Bicycle Master Plan.

Scranton Road is classified as a Four-Lane Collector Road between Carroll Canyon Road and Barnes Canyon Road in the Mira Mesa Community Plan, City of San Diego. Currently it is built to its ultimate classification between Carroll Canyon Road and Morehouse Drive. North of Morehouse Drive to Barnes Canyon Road, Scranton Road narrows to a two-lane section with parking on both curbs. The posted speed limit is 35 MPH. Based on the San Diego's Region Bike Map, Scranton Road is currently classified as a Class III Bicycle Route in each direction.

Vista Sorrento Parkway is classified as a Four-Lane Collector between Mira Mesa Boulevard and Sorrento Valley Boulevard in the Mira Mesa Community Plan, City of San Diego. It is currently built to this classification from Mira Mesa Blvd to I-805 Northbound Hook Ramps and as a 2 lane collector from I-805 Northbound Hook Ramps to Lusk Blvd. The posted speed limit is 45 mph. Curbside parking is generally prohibited. Based on the San Diego Regional Map, Vista Sorrento Parkway (south of Lusk Blvd) is currently classified as a Class II Bicycle Lane in each direction. However north of Lusk Blvd it is proposed to have either a Class II Bicycle Lane or Class III Bicycle Route as per the 2002 City of San Diego Bicycle Master Plan.

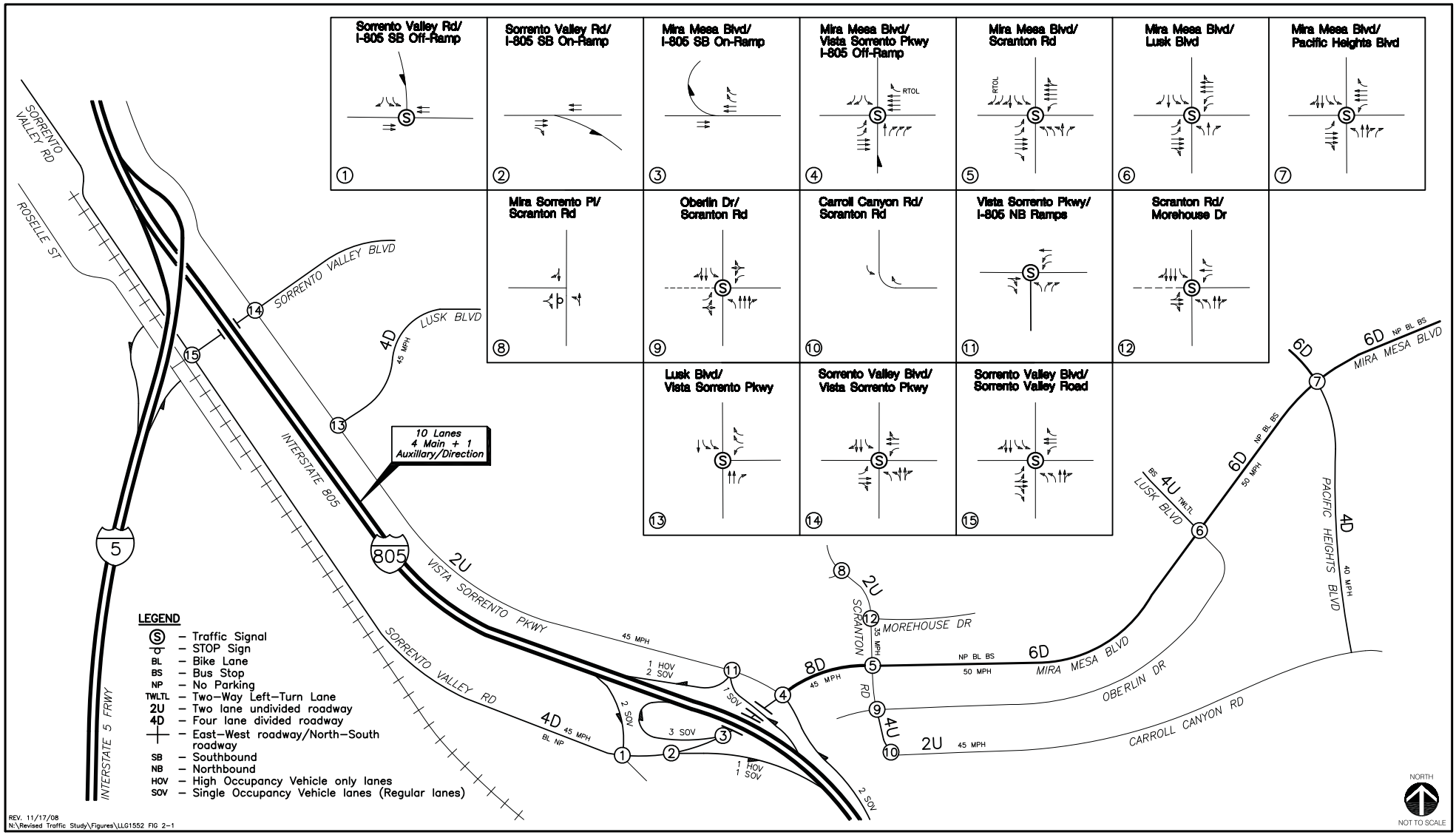

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Figure 2-1

Existing Conditions Diagram

I-805/Mira Mesa Blvd/
Sorrento Valley Rd Interchange

Sorrento Valley Road is classified as a Four-Lane Major Road west of I-805 in the Mira Mesa Community Plan, City of San Diego. It is currently built to this classification. The posted speed limit is 45 mph. Curbside parking is generally prohibited. Based on the San Diego's Region Bike Map, Sorrento Valley Road is currently classified as a Class II Bicycle Lane in each direction.

Carroll Canyon Road is classified as a Four-Lane Major Road in the Mira Mesa Community Plan, City of San Diego. Currently, Carroll Cyn Rd is a two-lane collector with a two-way left turn lane. Based on San Diego's Region Bike Map, Carroll Cyn Rd is currently classified as a Class III Bicycle Route in each direction.

2.2 Existing Traffic Volumes

Existing weekday AM and PM peak hour traffic volumes were collected at the study intersections to capture peak commuter activity. The peak hour manual turning movement counts were conducted in May 2005, while schools were in session. Counts were conducted during both AM (7:00-9:00) and PM (4:00-6:00) peak periods. Three-day bi-directional daily traffic counts were conducted in May 2005. Ramp volumes were obtained from CALTRANS.

Appendix A contains the manual count sheets, segment and ramp volumes. *Figure 2-2* depicts the peak hour intersection turning movement, segment and ramp volumes at the study area intersections, segments and ramps.

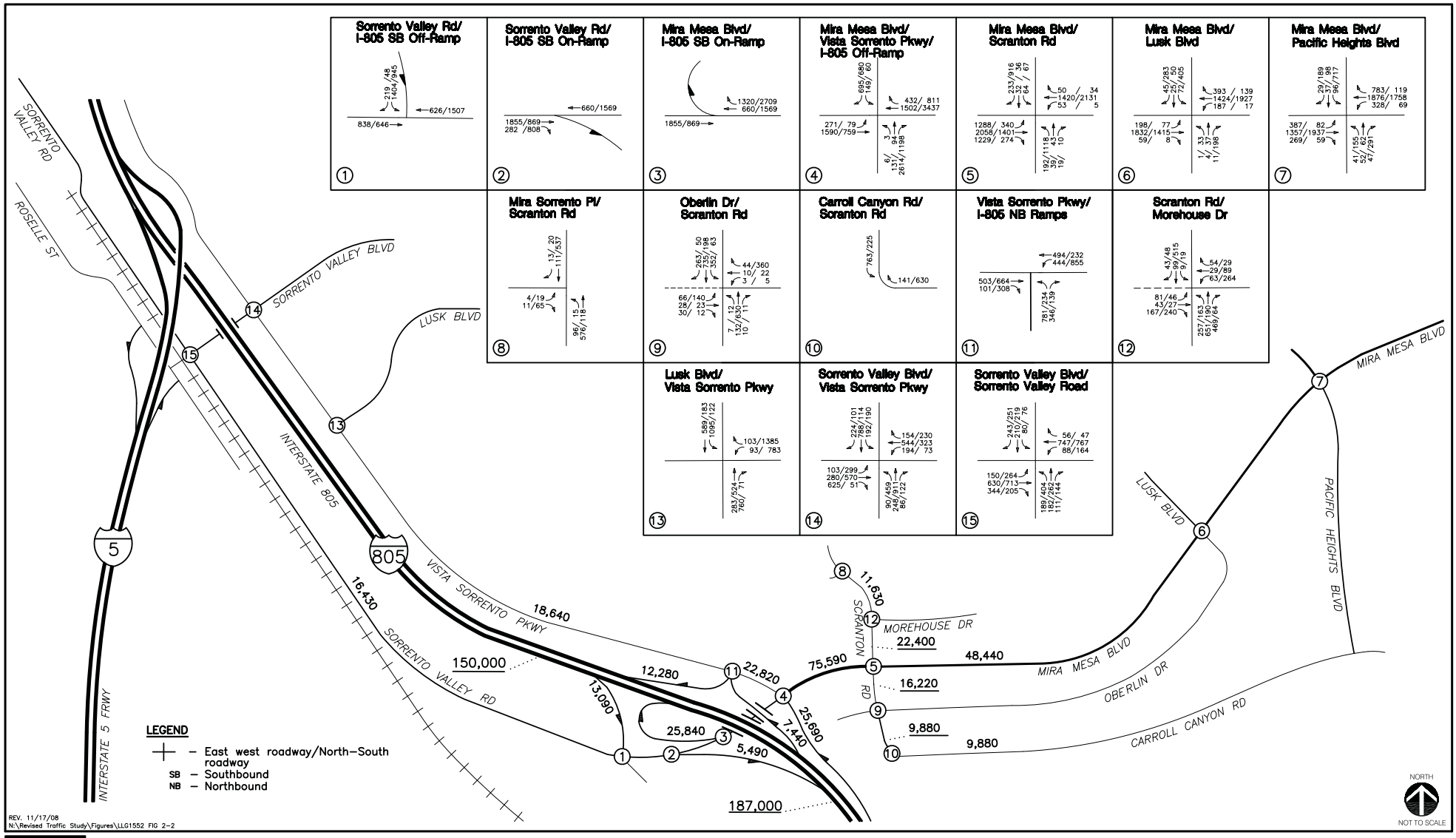

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Figure 2-2

Existing Traffic Volumes
AM/PM Peak Hours & ADTs

I-805/Mira Mesa Blvd/
Sorrento Valley Rd Interchange

3.0 ANALYSIS APPROACH AND METHODOLOGY

Level of Service (LOS) is the term used to denote the different operating conditions which occur on a given roadway facility under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of Service provides an index to the operational qualities of a roadway facility. Level of Service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Additional categories of LOS F have been developed to identify varying degrees of congestion on freeway facilities. The "measures of effectiveness" (MOEs) represented by the Level of Service designation are reported differently for signalized intersections, roadway segments, freeway segments, freeway merge and freeway diverge locations.

3.1 Intersections

3.1.1 *Signalized Intersections*

Signalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay was determined utilizing the methodology found in Chapter 16 of the *2000 Highway Capacity Manual (HCM),* with the assistance of the *Synchro* (version 6) computer software. The delay values (represented in seconds) were qualified with a corresponding intersection Level of Service (LOS). Signalized intersection calculation worksheets and a more detailed explanation of the methodology are attached in *Appendix B*.

3.1.2 *Unsignalized Intersections*

Unsignalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay and Levels of Service (LOS) was determined based upon the procedures found in Chapter 17 of the *2000 Highway Capacity Manual (HCM),* with the assistance of the *Synchro* (version 6) computer software. Unsignalized intersection calculation worksheets and a more detailed explanation of the methodology are attached in *Appendix B.*

3.2 ILV Operations

An additional analysis of State-owned intersections was completed using the Intersecting Lane Vehicles (ILV) methodology as described in Chapter 400, Topic 406 of the Department Highway Design Manual. The ILV methodology is based on the concept that the capacity of intersecting lanes of traffic is 1,500 vehicles per hour. For the typical local street interchange there is usually a critical intersection of a ramp and the crossroads that establishes the capacity of the interchange. Listed below are the values of ILV/hr for various traffic flow conditions.

- *UNDER* - ILV/hr<1200
  Description: Stable flow with slight, but acceptable delay. Occasional signal loading may develop. Free mid-block operations.

- *NEAR* - ILV/hr 1200 – 1500:

Description: Unstable flow with considerable delays possible. Some vehicles occasionally wait two or more cycles to pass through the intersection. Continuous backup occurs at some approaches.

- *OVER* - ILV/hr >1500:
  Description: Stop and go operation with severe delay and heavy congestion[1]. 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.

Note: 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.

3.3 Street Segments

Street segment analysis is based upon the comparison of daily traffic volumes (ADTs) to the City of San Diego's Roadway Classification and Level of Service table. This table provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics. The City of San Diego's *Roadway Classification, Level of Service, and ADT Table* is attached in *Appendix B*.

3.4 Freeway Mainline Segments

Freeway segments were analyzed during the AM and PM peak hours based on the methodologies accepted by CALTRANS District 11. Freeway segment LOS is based on the volume to capacity ratio on the freeway. The freeway capacities used in the analysis include 2,000 vehicles/hour for a mainline lane and 1,200 vehicles/hour for an auxiliary lane.

3.5 Ramp Merge/Diverge Sections

Ramp merge/diverge ramp operations were analyzed under AM and PM peak hour conditions. Operational characteristics were reported utilizing the methodology found in Chapter 25 of the *2000 Highway Capacity Manual (HCM),* with the assistance of the *Highway Capacity Software* (version 4.1).

Levels of service in merge and diverge influence areas are defined in terms of density for all cases of stable operations (LOS A through E). However, LOS F exists when the demand exceeds the capacity of upstream or downstream freeway sections or the capacity of the ramp.

3.6 Ramp Meters

Ramp meter analysis in this report is based on a fixed rate methodology. The results of the fixed rate methodology are based on the most restrictive (rate code F) ramp meter rate provided by Caltrans. Given this fact, such an approach is considered conservative and in some cases produces unrealistic long queue lengths and delays. Current ramp meter calculations / methodologies, in general, are not able to account for driver behavior and trip diversion, which reiterates the overestimation inherent in ramp meter analysis.

4.0 ANALYSIS OF EXISTING OPERATIONS

4.1 Intersections

Intersection capacity analyses were conducted for the study intersections under existing conditions. *Figure 2–1* illustrates the intersection lane configurations utilized in the analysis. Appendix C contains the signal timing and the signal design sheets for the study intersections, which were used in the intersection analysis. Appendix D contains the intersection calculation worksheets.

Table 4–1 summarizes the existing intersections level of service. As seen in *Table 4-1*, all intersections are calculated to currently operate at LOS D or better during both the AM and PM peak hours except the following intersections:

- Mira Mesa Boulevard/ Vista Sorrento Parkway/ I-805 Northbound Off ramp (LOS F during AM peak hour)
- Mira Mesa Boulevard / Scranton Road (LOS F during both AM and PM peak hour)
- Mira Mesa Boulevard / Pacific Heights Boulevard (LOS F during both AM and PM peak hour)
- Vista Sorrento Parkway / I-805 Northbound Hook Ramps (LOS E during AM)

Table 4–2 summarizes the queuing information on all I-805 / Mira Mesa Boulevard / Sorrento Valley Road interchange off-ramps. Appendix E contains the queuing calculation worksheets.

4.2 Intersection Lane Vehicle (ILV) Analysis

Table 4–3 summarizes the ILV analysis results for the signalized intersections on I-805/ Mira Mesa Boulevard / Sorrento Valley Road interchange off-ramps. As seen in *Table 4-3*, all intersections are calculated to currently operate "At Capacity" or better during both the AM and PM peak hours except the following:

- I-805 Northbound Off-Ramp / Mira Mesa Boulevard / Vista Sorrento Parkway (Over Capacity during both AM and PM peak hours)
- I-805 Northbound Ramps / Vista Sorrento Parkway (Over Capacity during AM peak hours)

Appendix F contains the ILV analysis worksheets.

4.3 Street Segments

Existing street segment analyses were conducted for roadways in the study area. Analysis was based on the approved Traffic Volumes Report dated September 21, 2005. *Table 4–4* reports existing street segment operations on a daily basis. As seen in *Table 4–4*, all study area street segments are calculated to currently operate at LOS D or better except the following:

- Mira Mesa Boulevard, Vista Sorrento Parkway to Scranton Road (LOS F)
- Vista Sorrento Parkway, Lusk Boulevard to I-805 Northbound ramps (LOS F)

TABLE 4–1
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing	
			Delay[a]	LOS[b]
Sorrento Valley Rd/ I-805 SB Off ramp	Signal	AM	19.5	B
		PM	27.3	C
Mira Mesa Blvd/ Vista Sorrento Pkwy/ I-805 NB Off ramp	Signal	AM	>100	F
		PM	34.5	C
Mira Mesa Blvd/ Scranton Rd	Signal	AM	>100	F
		PM	>100	F
Mira Mesa Blvd/ Lusk Blvd	Signal	AM	16.6	B
		PM	37.2	D
Mira Mesa Blvd/ Pacific Heights Blvd	Signal	AM	83.1	F
		PM	>100	F
Mira Sorrento Pl/Scranton Rd	Unsignalized	AM	12.8	B
		PM	19.5	C
Oberlin Dr/ Scranton Rd	Signal	AM	21.9	C
		PM	33.0	C
Vista Sorrento Pkwy/I-805 NB Ramps	Signal	AM	56.1	E
		PM	39.7	D
Morehouse Drive/ Scranton Rd	Signal	AM	27.9	C
		PM	40.7	D

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Delay and LOS worse than LOS D shown in **bold**.

SIGNALIZED

DELAY/LOS THRESHOLDS

Delay	LOS
0.0 < 10.0	A
10.1 to 20.0	B
20.1 to 35.0	C
35.1 to 55.0	D
55.1 to 80.0	E
> 80.1	F

TABLE 4–2
EXISTING OFF -RAMP QUEUE LENGTHS

Off Ramp Location	95 Percentile Queue Length (ft)					
	AM			PM		
	Left	Through	Right	Left	Through	Right
I-805 NB Off-Ramp to Vista Sorrento Pkwy	820	—	50	270	—	20
I-805 NB Off-Ramp to Mira Mesa Blvd	—	150	1550	—	140	450
I-805 SB Off ramp to Sorrento Valley Rd	370	—	80	370	—	40

General Notes:
1. Source: Synchro Analysis.
2. Queue lengths rounded to nearest 10 feet.

TABLE 4–3
CALTRANS ILV METHOD INTERSECTION OPERATIONS

Intersection	AM		PM	
	ILV[1]	Capacity[2]	ILV	Capacity
I-805 SB Off-Ramp / Sorrento Valley Rd	*1121*	*Under*	*1227*	*At*
I-805 NB Off-Ramp / Mira Mesa Blvd / Vista Sorrento Pkwy	*2182*	*Over*	*1853*	*Over*
I-805 NB Ramps / Vista Sorrento Pkwy	*1506*	*Over*	*1326*	*At*

Footnotes:
1. ILV = Intersecting Lane Vehicles.
2. CAPACITY is shown as *UNDER* capacity, *AT* capacity or *OVER* capacity;

   Under *Capacity = <1200 ILV/Hour*
   At Capacity = >1200 but < 1500 ILV/Hour
   Over *Capacity = >1500 ILV/Hour*

TABLE 4–4
EXISTING STREET SEGMENT OPERATIONS

Segment	Classification	Capacity at LOS E	Existing	
			ADT[a]	LOS[b]
Mira Mesa Blvd				
I-805 SB On ramp to Vista Sorrento Pkwy	8-lane Prime	70,000	54,950	C
Vista Sorrento Pkwy to Scranton Road	8-lane Prime	70,000	**75,590**	**F**
Scranton Road to Lusk Blvd	6-lane Prime	60,000	48,440	C
Sorrento Valley Road				
North of I-805 SB Off ramp	4-lane Major	40,000	16,430	B
I-805 SB Off ramp to I-805 SB on-ramp	4-lane Major	40,000	24,680	C
Vista Sorrento Pkwy				
Lusk Blvd to I-805 NB ramps	2-lane Collector	15,000	**18,640**	**F**
I-805 NB ramps to Mira Mesa Blvd	4-lane Collector	30,000	22,820	D
Scranton Road				
Mira Sorrento Place to Morehouse Drive	2-lane Collector	15,000	11,630	D
Morehouse Drive to Mira Mesa Blvd	6-lane Major	50,000	22,400	B
Mira Mesa Blvd to Oberlin Dr	6-lane Major	50,000	16,220	A
Oberlin Dr to Carroll Canyon Rd	4-lane Major	40,000	9,880	A
Carroll Canyon Road				
East of Scranton Road	2-lane Collector (continuous left-turn lane)	15,000	9,880	C

Footnotes:
a. ADT – Average Daily Traffic.
b. LOS – Level of Service.

General Notes:
1. Delay and LOS worse than LOS D shown in **bold**.
2. *Source*: Roadway classification based on Mira Mesa Community Plan and SANDAG's Functional Classification Network.

4.4 Freeway Facilities

Freeway segments were analyzed under existing conditions. *Table 4–5* shows the existing peak hour analysis results for the freeway segments in the project area. As shown in *Table 4–5*, the freeway segments in the project area are calculated to operate at LOS D or better with the following exceptions:

- I-805 Northbound, South of Mira Mesa Blvd Interchange (LOS F(0) in AM Peak Hour)
- I-805 Southbound, South of Mira Mesa Blvd Interchange (LOS E in PM Peak Hour)

4.5 Merge Sections

Ramp merge sections (i.e. on-ramps) were analyzed under existing conditions. Appendix G contains the ramp merge calculation sheets. As mentioned in Section 3.4, Levels of Service in merge influence areas are defined in terms of density for all cases of stable operations (LOS A through E). However, LOS F exists when the demand exceeds the capacity of upstream or downstream freeway sections or the capacity of the ramp. It should also be noted that the ramp analysis does not take into consideration the effects of upstream/downstream weaving or queue spillover from the intersections of the interchange.

Table 4–6 shows the existing merge analysis results for the freeway segments in the project area. As shown in *Table 4–6*, all freeway segments in the project area are calculated to operate at LOS D or better with the following exception:

- I-805 Southbound On-ramp from Mira Mesa Boulevard (LOS F during PM Peak Hour)
- I-805 Southbound On-ramp from Sorrento Valley Road (LOS F during PM Peak Hour)

4.6 Diverge Sections

Ramp diverge sections (i.e. off-ramps) were analyzed under existing conditions. Appendix H contains the ramp diverge calculation sheets. As mentioned in Section 2.4, Levels of Service in diverge influence areas are defined in terms of density for all cases of stable operations (LOS A through E). However, LOS F exists when the demand exceeds the capacity of upstream or downstream freeway sections or the capacity of the ramp. It should also be noted that the ramp analysis does not take into consideration the effects of upstream/downstream weaving or queue spillover from the intersections of the interchange.

Table 4–7 shows the existing merge analysis results for the freeway segments in the project area. As shown in *Table 4–7*, all freeway segments in the project area are calculated to operate at LOS D or better with the following exceptions:

- I-805 Northbound Off-ramp to Vista Sorrento Parkway (LOS E during AM Peak Hour)
- I-805 Northbound Off-ramp to Mira Mesa Boulevard (LOS F during AM Peak Hour)

TABLE 4–5
EXISTING FREEWAY SEGMENT OPERATIONS

Freeway and Segment	Direction	Number of Lanes	Capacity	ADT	Peak Hour % (K)		Dir. Split % (D)		Truck Factor	Peak Hour Volume		V/C		LOS	
					AM	PM	AM	PM		AM	PM	AM	PM	AM	PM
I-805 North of Mira Mesa Blvd Interchange	NB Mainlines	4M+1A	9,200	150,000	0.0658	0.0713	0.5826	0.4521	0.921	6244	5253	0.679	0.571	C	B
	SB Mainlines	4M+1A	9,200	150,000	0.0658	0.0713	0.4174	0.5479	0.921	4474	6366	0.486	0.692	B	C
I-805 North of Mira Mesa Blvd Interchange	NB Mainlines	4M+1A	9,200	187,000	0.0703	0.0734	0.6826	0.3931	0.937	9577	5758	1.041	0.626	**F(0)**	C
	SB Mainlines	4M+1A	9,200	187,000	0.0703	0.0734	0.3174	0.6069	0.937	4453	8890	0.484	0.966	B	**E**

General Notes:

1. Capacity calculated at 2000 vph per lane and 1200 vph per aux lane (M: Mainline, A: Aux. Ex. 4M+1A=4 Mainline + 1 Aux)
2. Existing ADT Volumes from CALTRANS
3. Peak Hour Percentage (K) and Direction Split (D) for I-805 South of Mira Mesa Blvd Interchange was obtained from Caltrans "2005 Peak Hour Volume Data" Report.
4. Peak Hour Percentage (K) and Direction Split (D) for I-805 North of Mira Mesa Blvd Interchange not available from Caltrans. Therefore, they were estimated based on the 2010 traffic counts on the ramps.
5. Truck Factor was obtained from "2004 Annual Average Daily Truck Traffic on the California State Highway System", August 2005
6. Peak Hour Volume = ((ADT)(K)(D)/Truck Factor)
7. V/C = ((ADT)(K)(D)/Truck Factor/Capacity)

LOS	V/C
A	<0.41
B	0.62
C	0.8
C	0.8
D	0.92
E	1
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

TABLE 4–6
EXISTING RAMP MERGE OPERATIONS

Ramp Merge Location	Mainline Facility Before Merge (Rightmost 2 Lanes Only)					Mainline Facility at Off-Ramp Merge (Rightmost 2 Lanes Only)					Mainline Facility After Merge (All Mainline Lanes)					Ramp Junction LOS[3]	
	Volume [1]		Capacity [2]	LOS F?		Volume		Capacity	LOS F?		Volume		Capacity	LOS F?			
	AM	PM		AM	PM	AM	PM		AM	PM	AM	PM		AM	PM	AM	PM
I-805 NB On-Ramp from Vista Sorrento Pkwy (4 Mainline lanes /2-lane On-Ramp)	1379	990	4700	N	N	2010	2336	4600	N	N	7229	6081	9400	N	N	A	A
I-805 SB Loop ramp from Mira Mesa Blvd (4 Mainline lanes /2-lane On-Ramp)	748	1410	4700	N	N	2405	**4811**	4600	N	Y	5237	**10147**	9400	N	Y	A	F
I-805 SB On ramp from Sorrento Valley Rd (4 Mainline lanes /2-lane On-Ramp)	1624	2435	4700	N	N	1950	3370	4600	N	Y	5155	10292	9400	N	Y	B	F

Footnotes:

1. Volumes factored up to account for peak hour factor (PHF) and truck percentages and are expressed in vehicles per hour (vph).
2. Capacity based on methodology found in Chapter 25 of the *2000 Highway Capacity Manual (HCM)*. For mainlines, capacity for the mainline section is referred and for ramps, capacity is referred as Ramp junction capacity at the merge influence area.
3. Ramp operations dependent on freeway mainline operations and ramp capacity.

TABLE 4–7
EXISTING RAMP DIVERGE OPERATIONS

Ramp Diverge Location	Mainline Facility Before Diverge (Rightmost 2 Lanes Only)					Mainline Facility at Off-Ramp Diverge (Off-ramp pc/h volume)					Mainline Facility After Diverge (All Mainline Lanes)					Ramp Junction LOS[3]	
	Volume [1]		Capacity [2]	LOS F?		Volume		Capacity	LOS F?		Volume		Capacity	LOS F?			
	AM	PM		AM	PM	AM	PM		AM	PM	AM	PM		AM	PM	AM	PM
I-805 NB Off-Ramp to Vista Sorrento Pkwy (4 Mainline lanes /1-lane Off-Ramp)	4182	2496	4400	N	N	1305	432	2000	N	N	6598	4735	9400	N	N	E	C
I-805 NB Off-Ramp to Mira Mesa Blvd (4 Mainline lanes /2-lane Off-Ramp)	5240	2842	4400	Y	N	3185	1499	3800	N	N	7903	5167	9400	N	N	**F**	B
I-805 SB Off ramp to Sorrento Valley Rd (4 Mainline lanes /2-lane Off-Ramp)	2737	2767	4400	N	N	1879	1150	3800	N	N	3301	6220	9400	N	N	B	B

Footnotes:

1. Volumes factored up to account for peak hour factor (PHF) and truck percentages and are expressed in vehicles per hour (vph).
2. Capacity based on methodology found in Chapter 25 of the *2000 Highway Capacity Manual (HCM)*. For mainlines, capacity for the mainline section is referred and for ramps, capacity is referred as Ramp junction capacity at the merge influence area.
3. Ramp operations dependent on freeway mainline operations and ramp capacity.

4.7 Ramp Meters

Ramp meters were analyzed under existing conditions. *Table 4–8* shows the existing peak hour analysis results for the freeway ramp meters in the project area. As shown in *Table 4–8*, all freeway ramp meters in the project area are calculated to operate at acceptable conditions or better with the following exceptions:

- I-805 Southbound On-ramp from Mira Mesa Blvd
- I-805 Northbound On-ramp from Vista Sorrento Parkway

TABLE 4–8
EXISTING RAMP METER OPERATIONS (FIXED RATE METHOD)

Condition	Minimum/ Maximum Rate	Peak Hour Demand [b]	Peak Hour Demand/ Lane [c]	Meter Flow Rate/Lane	Excess Demand	Delay (min)	Queue (ft)
I-805 Southbound On-ramp from Sorrento Valley Rd (3:00 PM - 7:00 PM)							
Existing	Min	808	687	509	178	21	4445
	Max	808	687	996	0	0	0
I-805 Southbound On-ramp from Mira Mesa Blvd (3:00 PM - 6:30 PM)							
Existing	Min	2709	1084	828	256	19	6390
	Max	2709	1084	996	88	5	2190
I-805 Northbound On-ramp from Vista Sorrento Parkway (3:00 PM - 7:00 PM)							
Existing	Min	1163	605	197	408	124	10194 [e]
	Max	1163	605	348	257	44	6419 [e]

Footnotes:

a. Meter rates obtained from CALTRANS (Appendix C).

b. Peak Hour Volumes obtained from the existing ramp data.

c. Lane Utilization Factor obtained from available ramp data, which was obtained from CALTRANS.

d. Ramp meters were assumed to be operating at unacceptable conditions, if the traffic peak hour demand/lane/hour is greater than the maximum meter rate.

e. This is based on a worst-case scenario and the actual observed queues are much less. In addition, field observations indicated that the ramp meters are not operated on every weekday PM peak hour but are switched on occasionally.

5.0 PLANNED IMPROVEMENTS TO THE ROADWAY NETWORK

The City of San Diego currently has plans for two major roadway improvements within the study area. These planned improvements were incorporated in various Traffic Models and will be discussed in later sections. The two network improvements are as follows:

5.1 Mira Sorrento Place

Mira Sorrento Place is a planned road connecting Scranton Road and Vista Sorrento Parkway at the I-805 Northbound Ramps. This link is planned to be a four-lane collector facility, and will provide an alternate access for traffic to access I-805, thus reducing the traffic volume on Mira Mesa Boulevard. This project is currently funded and under construction.

The Mira Sorrento Place connection was assumed to be completed in all the future scenarios.

5.2 Carroll Canyon Road Extension

Currently, Carroll Canyon Road ends just west of Scranton Road. It is planned to connect Carroll Canyon Road to Sorrento Valley Road under the I-805. This link is planned to be a four-lane facility.

A full analysis was conducted with and without the Carroll Canyon Road extension in both 2010 and 2030 time frames.

6.0 TRAFFIC VOLUMES FORECAST

6.1 Forecast Models

Two future years were analyzed, 2010 and 2030. The Average Daily Traffic (ADT) volume forecast was obtained from the SANDAG Series 10 Model.

Land Use assumptions contained in the SANDAG Model within the I-805/Sorrento Valley Road/Mira Mesa Boulevard interchange area were thoroughly reviewed and were updated as required before running the model. Attachment B contains a memorandum prepared by LLG, which outlines the various land use changes in the Model. The land use changes in the model were approved by the City of San Diego and CALTRANS.

6.2 Network Modifications and Model Outputs

The following six (6) scenarios forecast plots (which included the recommended land use modifications) were requested from SANDAG (see *Appendix I*).

TABLE 6–1
MODEL ASSUMPTIONS

Model Scenario	Year	Mira Sorrento Place Extension IN?	Carroll Canyon Extension IN?	Direct Access Ramp at I-805/Lusk IN?
1	2010	Yes	No	No
2		Yes	Yes	No
3	2030	Yes	No	No
4		Yes	Yes	No
5		Yes	No	Yes
6		Yes	Yes	Yes

A full analysis with and without the potential Direct Access Ramp (DAR) at I-805/Lusk Boulevard was <u>not</u> conducted. Instead, a comparison of the forecast volumes was conducted (compare scenarios 3 to 5 and 4 to 6) and the scenario with the highest forecasted volumes were utilized in the future forecast analysis. It was found that with the DAR completed, volumes at the subject interchange were slightly lower (see Table 6-2). Therefore, ***Scenarios 5 and 6 were not included in the analysis***. Scenarios 1–4 were included.

TABLE 6–2
WITHOUT LUSK BLVD DAR VS. WITH DAR COMPARISON

Ramps ADT Comparison (2030 Traffic Volumes—Unadjusted Directly from the Model)				
Location	**Without Carroll Canyon Rd. Ext**		**With Carroll Canyon Rd. Ext**	
	Without DAR *Scenario 3*	**With DAR** *Scenario 5*	**Without DAR** *Scenario 4*	**With DAR** *Scenario 6*
I-805 SB Off-ramp to Sorrento Valley Rd.	13,500	13,000	15,300	14,600
I-805 SB On-ramp from Sorrento Valley Rd.	6,200	4,900	12,700	9,800
I-805 SB On-ramp from Mira Mesa Blvd.	29,900	28,700	24,700	25,300
I-805 NB Off-ramp to Mira Mesa Blvd.	20,000	19,800	20,000	19,700
I-805 NB Off-ramp to Vista Sorrento Pkwy.	16,000	15,000	16,200	15,200
I-805 NB On-ramp from Vista Sorrento Pkwy.	12,900	12,300	12,900	12,200
Key Segments ADT Comparison (2030 Traffic Volumes—Unadjusted Directly from the Model)				
Location	**Without Carroll Canyon Rd. Ext**		**With Carroll Canyon Rd. Ext**	
	Without DAR *Scenario 3*	**With DAR** *Scenario 5*	**Without DAR** *Scenario 4*	**With DAR** *Scenario 6*
Mira Mesa Blvd. (between I-805 & Scranton Rd)	69,200	68,100	58,200	57,600
Mira Mesa Blvd. (between Scranton Rd & Lusk Blvd)	53,200	51,600	50,800	49,700
Vista Sorrento Pkwy. (South of Lusk Blvd)	14,800	14,700	13,600	13,900
Sorrento Valley Rd. (South of Sorrento Valley Blvd)	16,500	14,000	17,800	15,700
Scranton Rd. (between Mira Sorrento Pl & Morehouse Dr)	6,700	6,600	6,000	6,100
Scranton Rd. (between Mira Mesa Blvd & Oberlin Dr)	24,800	25,100	16,700	16,000
Carroll Cyn Rd. (between Scranton Rd & Youngstown Way)	14,700	14,900	23,900	23,600

7.0 YEAR 2010 (WITHOUT CARROLL CANYON ROAD EXTENSION) ANALYSIS

7.1 Forecasted Traffic Volumes

In order to forecast future traffic volumes Year 2010 without Carroll Canyon Road SANDAG Model run output was utilized. Most of the forecast ADT's were utilized as reported by the SANDAG model. However, some volumes were revised to ensure that the volumes were as accurate as possible. The forecast ADT volumes were then used to calculate peak hour volumes based partially on the existing relationship between ADT and peak hour volumes.

Several other Traffic Engineering principles and factors such as the K-factor and D-factor were also considered in the forecast analysis (see *Appendix C* for definitions). The forecast volumes were also checked for consistency between intersections, where no driveways or roadways exist between intersections, and they were compared to existing volumes. To determine the traffic volume changes due to the Mira Sorrento Place and the I-805 northbound off-ramp to Vista Sorrento Parkway, Select Link Assignments (see *Appendix J*) were also utilized.

Figure 7–1 illustrates the intersection lane configurations utilized in the analysis. *Figure 7-2* illustrates forecasted 2010 traffic volumes without the Carroll Canyon Road extension.

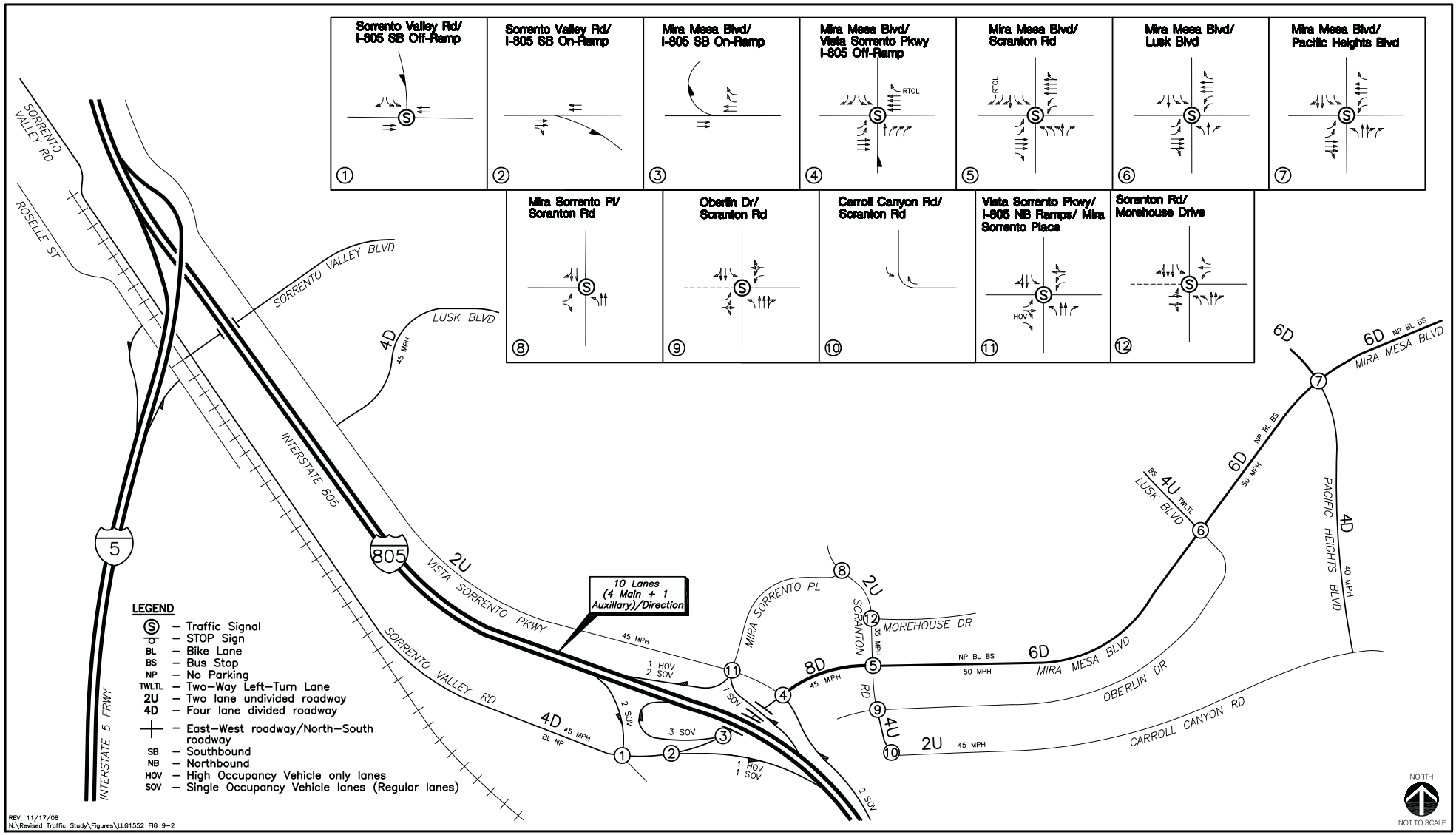
7.2 Intersections

Intersection capacity analyses were conducted for the study intersections for Year 2010 without Carroll Canyon Road Extension Scenario. Appendix K contains the intersection calculation worksheets.

Table 7–1 summarizes the existing signalized intersections level of service. As seen in *Table 7–1*, all intersections are calculated to currently operate at LOS D or better during both the AM and PM peak hours except the following signalized intersections:

- Mira Mesa Boulevard/ Vista Sorrento Parkway/ I-805 Northbound Off ramp (LOS F during AM peak hour)
- Mira Mesa Boulevard / Scranton Road (LOS F during both AM and PM peak hour)
- Mira Mesa Boulevard / Pacific Heights Boulevard (LOS F during PM peak hour)
- Mira Sorrento Place/Scranton Road (LOS E during both AM and PM peak hour)
- Oberlin Drive/Scranton Road (LOS F during PM peak hour)
- Vista Sorrento Parkway / I-805 Northbound Hook Ramps (LOS E during both AM and PM peak hour

Table 4–2 summarizes the queuing information on all I-805 / Mira Mesa Boulevard / Sorrento Valley Road interchange off-ramps. *Appendix L* contains the queuing calculation worksheets.



LINSCOTT LAW & GREENSPAN engineers

Figure 7-1

Roadway & Intersection Geometry
2010 Without Carroll Canyon Rd Extension

I-805/Mira Mesa Blvd/ Sorrento Valley Rd Interchange

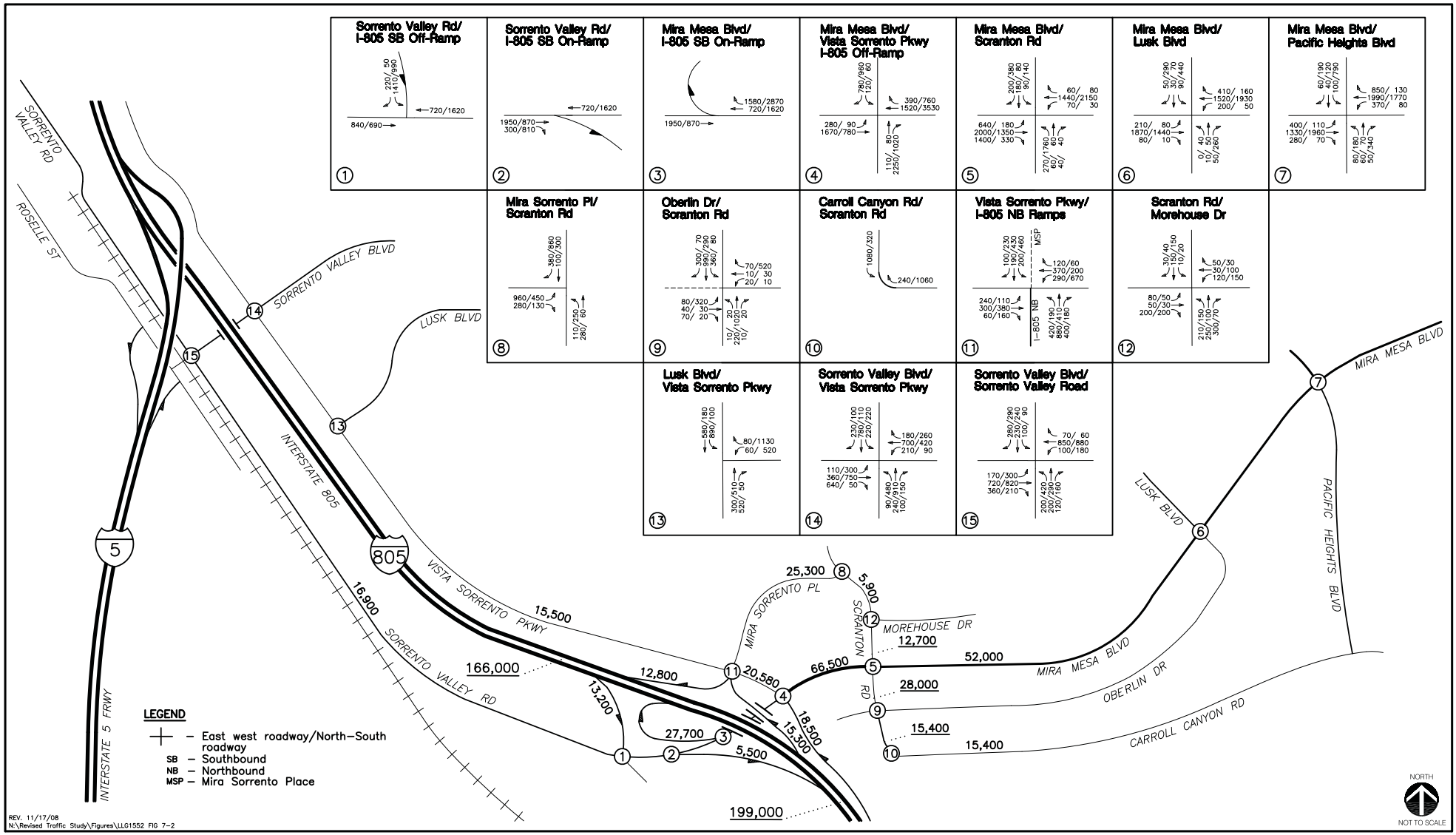


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Figure 7-2

2010 Scenario
Without Carroll Canyon Rd Extension
AM/PM Peak Hours & ADTs
I-805/Mira Mesa Blvd/
Sorrento Valley Rd Interchange

7.3 Intersection Lane Vehicle (ILV) Analysis

Table 7–3 summarizes the ILV analysis results for the signalized intersections on I-805/ Mira Mesa Boulevard / Sorrento Valley Road interchange off-ramps. As seen in *Table 7–3*, all intersections are calculated to operate "at Capacity" or better during both the AM and PM peak hours except the following:

- I-805 Northbound Off-Ramp / Mira Mesa Boulevard / Vista Sorrento Parkway (Over Capacity during both AM and PM peak hours)
- I-805 Northbound Ramps / Vista Sorrento Parkway (Over Capacity during both AM and PM peak hours)

Appendix M contains the ILV analysis worksheets.

TABLE 7–1
SIGNALIZED INTERSECTION OPERATIONS

Intersection	Peak Hour	Existing		2010 without CCR		2010 with CCR		2010 with CCR with North DAR's		2030 without CCR		2030 with CCR	
		Delay[a]	LOS[b]	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Sorrento Valley Rd/ I-805 SB Off ramp/Carroll Canyon Rd. [e]	AM	19.5	B	19.7	B	33.6	C	31.6	C	22.3	C	45.0	D
	PM	27.3	C	37.0	D	**>100**	**F**	**>100**	**F**	**57.2**	**E**	**>100**	**F**
Mira Mesa Blvd/ Vista Sorrento Pkwy/ I-805 NB Off ramp [f]	AM	**>100**	**F**	**>100**	**F**	**>100**	**F**	**>100**	**F**	**>100**	**F**	**>100**	**F**
	PM	34.5	C	41.8	D	20.6	C	19.8	B	**>100**	**F**	27.4	C
Mira Mesa Blvd/ Scranton Rd [f]	AM	**>100**	**F**	**80.2**	**F**	**94.4**	**F**	**87.2**	**F**	**>100**	**F**	**>100**	**F**
	PM	**>100**	**F**	**>100**	**F**	**81.2**	**F**	**81.5**	**F**	**>100**	**F**	**87.4**	**F**
Mira Mesa Blvd/ Lusk Blvd [f]	AM	16.6	B	12.2	B	15.4	B	15.4	B	18.1	B	22.7	C
	PM	37.2	D	34.1	C	26.7	C	26.2	C	54.9	D	29.3	D
Mira Mesa Blvd/ Pacific Heights Blvd [f]	AM	**83.1**	**F**	41.9	D	42.7	D	41.5	D	**56.2**	**E**	**57.7**	**E**
	PM	**>100**	**F**	**>100**	**F**	**>100**	**F**	**>100**	**F**	**>100**	**F**	**>100**	**F**
Mira Sorrento Pl/Scranton Rd [g]	AM	12.8	B	**69.6**	**E**	**75.5**	**E**	**70.2**	**E**	**>100**	**F**	**>100**	**F**
	PM	19.5	C	**77.3**	**E**	**73.3**	**E**	**68.8**	**E**	**93.5**	**F**	**>100**	**F**
Oberlin Dr/ Scranton Rd	AM	21.9	C	34.0	C	21.7	C	21.8	C	33.8	C	41.3	D
	PM	33.0	C	**>100**	**F**	46.8	D	47.2	D	**>100**	**F**	**64.2**	**E**
Carroll Canyon Rd/ Scranton Rd [e]	AM	DNE [d]		DNE		13.0	B	14.6	B	DNE		17.8	B
	PM					14.6	B	20.4	C			19.1	B
Vista Sorrento Pkwy/I-805 NB Ramps [h]	AM	**56.1**	**E**	**56.0**	**E**	47.5	D	44.8	D	**75.9**	**E**	**68.6**	**E**
	PM	39.7	D	**60.6**	**E**	51.8	D	44.4	D	**71.0**	**E**	**60.3**	**E**
Morehouse Dr/ Scranton Rd	AM	27.9	C	35.6	D	19.8	B	19.7	B	38.2	C	30.6	C
	PM	40.7	D	44.5	D	36.9	D	36.5	D	48.2	D	38.4	D
Carroll Canyon Road/ I-805 DAR	AM	DNE		DNE		DNE		46.5	D	DNE		DNE	
	PM							18.8	B				

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. CCR: Carroll Canyon Road Extension
d. DNE: Does Not Exist, no conflicting movements.
e. Intersection Lane Configuration for future scenarios was obtained from the "*Carroll Canyon Road Extension Traffic Impact Analysis*" Report dated April 2005.
f. Intersection Lane Configuration for future scenarios was obtained from the "*Qualcomm Building W Traffic Study*" Report dated April 1, 2004. The improvements suggested in the Traffic Study are under design stage.
g. Intersection Lane Configuration for future scenarios was obtained from the "*Mira Sorrento Place Extension Traffic Impact Analysis*" Report dated February 27, 2003.
h. Intersection Lane Configuration for future scenarios was obtained from the "*I-805 Northbound Hook Ramp to Vista Sorrento Pkwy*" Memorandum dated November 27, 2005, submitted by LLG.

SIGNALIZED DELAY/LOS THRESHOLDS	
Delay	LOS
0.0 < 10.0	A
10.1 to 20.0	B
20.1 to 35.0	C
35.1 to 55.0	D
55.1 to 80.0	E
> 80.1	F

TABLE 7–2
OFF-RAMP QUEUE LENGTHS

Off Ramp Location	Model Run: Scenario	95th Percentile Queue Length (feet)					
		AM			PM		
		Left	Through	Right	Left	Through	Right
I-805 SB Off-Ramp to Sorrento Valley Road	*Existing*	*370*	—	*80*	*370*	-	*40*
	2010 w/o CCR	370	—	90	480	-	50
	2010 w CCR	270	430		490	260	
	2010 w CCR with North DAR's	230	360		420	220	
	2030 w/o CCR	470	—	100	630	-	60
	2030 w CCR	290	450		540	310	
I-805 NB Off-Ramp to Mira Mesa Boulevard	*Existing*	—	*150*	*1550*	—	*140*	*450*
	2010 w/o CCR	—	110	1290	—	120	290
	2010 w CCR	—	70	740	—	100	110
	2010 w CCR with North DAR's	—	70	720	—	100	80
	2030 w/o CCR	—	140	1430	—	120	300
	2030 w CCR	—	120	1480	—	100	220
I-805 SB Off-Ramp to Sorrento Valley Road	*Existing*	*820*	—	*50*	*270*	-	*20*
	2010 w/o CCR	530	490	110	270	280	50
	2010 w CCR	470	450	100	230	210	50
	2010 w CCR with North DAR's	430	420	90	210	200	50
	2030 w/o CCR	700	610	150	290	280	60
	2030 w CCR	560	480	110	320	280	50

General Notes:

1. Source: Synchro Analysis.
2. Queue lengths rounded to nearest 10 feet.

TABLE 7–3
CALTRANS ILV METHOD INTERSECTION OPERATIONS

Intersection	Model Run: Scenario	AM		PM	
		ILV[a]	Capacity[b]	ILV	Capacity
I-805 SB Off-Ramp/ Sorrento Valley Road	*Existing*	*1121*	*Under*	*1227*	*At*
	2010 w/o CCR	1125	Under	1305	At
	2010 w CCR	1785	Over	1930	Over
	2010 w CCR with North DAR's	1672	Over	1870	Over
	2030 w/o CCR	1225	At	1420	At
	2030 w CCR	1890	Over	2070	Over
I-805 NB Off-Ramp / Mira Mesa Boulevard / Vista Sorrento Parkway	*Existing*	*2182*	*Over*	*1853*	*Over*
	2010 w/o CCR	2087	Over	1963	Over
	2010 w CCR	1838	Over	1689	Over
	2010 w CCR with North DAR's	1776	Over	1542	Over
	2030 w/o CCR	2242	Over	2114	Over
	2030 w CCR	1958	Over	1796	Over
I-805 NB Ramps / Vista Sorrento Parkway	*Existing*	*1506*	*Over*	*1326*	*At*
	2010 w/o CCR	1590	Over	1620	Over
	2010 w CCR	1520	Over	1530	Over
	2010 w CCR with North DAR's	1475	At	1420	At
	2030 w/o CCR	1780	Over	1755	Over
	2030 w CCR	1730	Over	1650	Over

Footnotes:

a. ILV = Intersecting Lane Vehicles.

b. CAPACITY is shown as *UNDER* capacity, *AT* capacity or *OVER* capacity;

Under *Capacity = <1200 ILV/Hour*

At Capacity = >1200 but < 1500 ILV/Hour

Over *Capacity = >1500 ILV/Hour*

7.4 Street Segments

Street segment analyses were conducted for roadways in the study area for Year 2010 without Carroll Canyon Road Extension Scenario. *Table 7–4* reports street segment operations on a daily basis. As seen in *Table 7–4*, all study area street segments are calculated to operate at LOS D or better except the following:

- Mira Mesa Boulevard, Vista Sorrento Parkway to Scranton Road (LOS E)
- Vista Sorrento Parkway, Lusk Boulevard to I-805 Northbound ramps (LOS F)
- Carroll Canyon Road, East of Scranton Road (LOS F)

7.5 Freeway Facilities

Freeway segments were analyzed for Year 2010 without Carroll Canyon Road Extension Scenario. *Table 7–5* shows the peak hour analysis results for the freeway segments in the project area. As shown in *Table 7–5*, all freeway segments in the project area are calculated to operate at LOS D or better with the following exceptions:

- I-805 Northbound, South of Mira Mesa Blvd Interchange (LOS F(0) in AM Peak Hour)
- I-805 Southbound, South of Mira Mesa Blvd Interchange (LOS F(0) in PM Peak Hour)

7.6 Merge Sections

Ramp merge sections (i.e. on-ramps) were analyzed for Year 2010 without Carroll Canyon Road Extension Scenario. Appendix N contains the ramp merge calculation sheets. *Table 7–6* shows the merge analysis results for the freeway segments in the project area. As shown in *Table 7–6*, all freeway segments in the project area are calculated to operate at LOS D or better with the following exceptions:

- I-805 Southbound On-ramp from Mira Mesa Boulevard (LOS F during PM Peak Hour)
- I-805 Southbound On-ramp from Sorrento Valley Road (LOS F during PM Peak Hour)

7.7 Diverge Sections

Ramp diverge sections (i.e. off-ramps) were analyzed for Year 2010 without Carroll Canyon Road Extension Scenario. Appendix O contains the ramp diverge calculation sheets. *Table 7–7* shows the diverge analysis results for the freeway segments in the project area. As shown in *Table 7–7*, all freeway segments in the project area are calculated to operate at LOS D or better with the following exceptions:

- I-805 Northbound Off-ramp to Vista Sorrento Parkway (LOS F during AM Peak Hour)
- I-805 Northbound Off-ramp to Mira Mesa Boulevard (LOS F during AM Peak Hour)

TABLE 7–4
STREET SEGMENT OPERATIONS

Segment	Capacity at LOS E	Existing		2010 without CCR		2010 with CCR		2010 with CCR with North DAR's		2030 without CCR		2030 with CCR	
		ADT[a]	LOS[b]	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS
Mira Mesa Blvd													
I-805 SB On ramp to Vista Sorrento Pkwy	70,000	54,950	C	56,400	D	44,300	C	42,500	C	61,700	D	52,000	C
Vista Sorrento Pkwy to Scranton Road	70,000	**75,590**	**F**	**66,500**	**E**	53,200	C	51,600	C	**69,200**	**E**	54,200	C
Scranton Road to Lusk Blvd	60,000	48,440	C	52,000	D	49,000	C	48,700	C	53,200	D	50,000	C
Sorrento Valley Road													
North of I-805 SB Off ramp	40,000	16,430	B	16,900	B	17,000	B	16,800	B	16,500	B	18,800	B
I-805 SB Off ramp to I-805 SB on-ramp	40,000	24,680	C	25,000	C	23,000	C	21,400	C	17,500	B	24,000	C
Vista Sorrento Pkwy													
Lusk Blvd to I-805 NB ramps[d]	15,000 / 30,000	**18,640**	**F**	**15,500**	**F**	**15,000**	**E**	**14,800**	**E**	19,100	**C**	18,600	C
I-805 NB ramps to Mira Mesa Blvd	30,000	22,820	D	20,580	D	19,600	C	18,600	C	21,000	D	20,000	C
Scranton Road													
Mira Sorrento Place to Morehouse Drive	15,000	11,630	D	5,900	B	6,800	B	7,000	B	6,700	B	7,800	C
Morehouse Drive to Mira Mesa Blvd	50,000	22,400	B	12,700	A	13,600	A	13,900	A	13,500	A	14,600	A
Mira Mesa Blvd to Oberlin Dr	50,000	16,220	A	28,000	B	22,300	B	22,700	B	30,000	C	23,000	B
Oberlin Dr to Carroll Canyon Rd	40,000	9,880	A	15,400	B	13,100	A	13,800	A	16,700	B	14,000	A
Carroll Canyon Road													
East of Scranton Road[d]	15,000 / 30,000	9,880	**C**	15,400	**F**	24,650	**F**	25,850	**F**	16,700	C	**25,900**	**E**
West of Scranton Road[d]	15000 / 30,000	N/A				17,800	**F**	17,200	**F**	N/A		20,600	D

Footnotes:
a. ADT – Average Daily Traffic.
b. LOS – Level of Service.
c. CCR – Carroll Canyon Road Extension
d. Assumed to be 4-lane collector in year 2030

General Notes:
1. Delay and LOS worse than LOS D shown in **bold**.

TABLE 7–5
YEAR 2010 (WITHOUT CARROLL CANYON ROAD EXTENSION) FREEWAY SEGMENT OPERATIONS

Freeway and Segment	Direction	Number of Lanes	Capacity	ADT	Peak Hour % (K)		Dir. Split % (D)		Truck	Peak Hour Volume		V/C		LOS	
					AM	PM	AM	PM	Factor	AM	PM	AM	PM	AM	PM
I-805 North of Mira Mesa Blvd Interchange	NB Mainlines	4M+1A	9,200	166,000	0.0619	0.0684	0.5978	0.4468	0.921	6671	5508	0.725	0.599	C	B
	SB Mainlines	4M+1A	9,200	166,000	0.0619	0.0684	0.4022	0.5532	0.921	4489	6821	0.488	0.741	B	C
I-805 South of Mira Mesa Blvd Interchange	NB Mainlines	4M+1A	9,200	199,000	0.0703	0.0734	0.6826	0.3931	0.937	10191	6128	1.108	0.666	**F(0)**	C
	SB Mainlines	4M+1A	9,200	199,000	0.0703	0.0734	0.3174	0.6069	0.937	4739	9461	0.515	1.028	B	**F(0)**

General Notes:

1. Capacity calculated at 2000 vph per lane and 1200 vph per aux lane (M: Mainline, A: Aux. Ex. 4M+1A=4 Mainline + 1 Aux)
2. Existing ADT Volumes from CALTRANS
3. Peak Hour Percentage (K) and Direction Split (D) for I-805 South of Mira Mesa Blvd Interchange was obtained from Caltrans "2005 Peak Hour Volume Data" Report.
4. Peak Hour Percentage (K) and Direction Split (D) for I-805 North of Mira Mesa Blvd Interchange not available from Caltrans. Therefore, they were estimated based on the 2010 traffic counts on the ramps.
5. Truck Factor was obtained from "2004 Annual Average Daily Truck Traffic on the California State Highway System", August 2005
6. Peak Hour Volume = ((ADT)(K)(D)/Truck Factor)
7. V/C = ((ADT)(K)(D)/Truck Factor/Capacity)

LOS	V/C
A	<0.41
B	0.62
C	0.8
C	0.8
D	0.92
E	1
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

TABLE 7–6
RAMP MERGE OPERATIONS

Ramp Merge Location	Model Run: Scenario	Mainline Facility Before Merge (Rightmost 2 Lanes Only)					Mainline Facility at On-Ramp Merge (Rightmost 2 Lanes Only)					Mainline Facility After Merge (All Mainline Lanes)					Ramp Junction LOS[c]	
		Volume [a]			LOS F?		Volume			LOS F?		Volume			LOS F?			
		AM	PM	Capacity [b]	AM	PM	AM	PM	Capacity	AM	PM	AM	PM	Capacity	AM	PM	AM	PM
I-805 NB On-Ramp from Vista Sorrento Pkwy	*Existing*	*1379*	*990*	*4700*	*N*	*N*	*2010*	*2336*	*4600*	*N*	*N*	*7229*	*6081*	*9400*	*N*	*N*	*A*	*A*
	2010 w/o CCR	1483	1028	4700	N	N	2108	2487	4600	N	N	7723	6377	9400	N	N	A	B
	2010 w CCR	1483	1033	4700	N	N	2108	2608	4600	N	N	7723	6516	9400	N	N	A	B
	2010 w CCR with North DAR's	1471	984	4700	N	N	2027	2327	4600	N	N	7596	6053	9400	N	N	A	A
	2030 w/o CCR	1820	1245	4700	N	N	2480	2796	4600	N	N	9368	7507	9400	N	N	B	B
	2030 w CCR	1320	952	4700	N	N	1980	2619	4600	N	N	6974	6221	10400	N	N	A	B
I-805 SB Loop ramp from Mira Mesa Blvd	*Existing*	*748*	*1410*	*4700*	*N*	*N*	*2405*	***4811***	*4600*	*N*	*Y*	*5237*	***10147***	*9400*	*N*	*Y*	*A*	***F***
	2010 w/o CCR	750	1517	4700	N	N	2734	**5120**	4600	N	**Y**	5574	**10861**	9400	N	**Y**	B	**F**
	2010 w CCR	732	1517	4700	N	N	2490	3865	4600	N	N	5260	**9606**	9400	N	Y	B	**F**
	2010 w CCR with North DAR's	666	1491	4700	N	N	2411	3814	4600	N	N	4933	**9456**	9400	N	Y	A	**F**
	2030 w/o CCR	907	1839	4700	N	N	3092	**5744**	4600	N	Y	6523	12706	9400	N	**N**	B	**F**
	2030 w CCR	704	1345	4700	N	N	2600	3894	4600	N	N	5265	8985	10400	N	**N**	B	C
I-805 SB On ramp from Sorrento Valley Rd	*Existing*	*1624*	*2435*	*4700*	*N*	*N*	*1950*	*3370*	*4600*	*N*	*N*	*5155*	***10292***	*9400*	*N*	***Y***	*B*	***F***
	2010 w/o CCR	1715	2603	4700	N	N	2062	3541	4600	N	N	5486	**10954**	9400	N	**Y**	B	**F**
	2010 w CCR	1443	1019	4700	N	N	2080	3115	4600	N	N	5487	**10954**	9400	N	**Y**	B	**F**
	2010 w CCR with North DAR's	1353	1017	4700	N	N	1990	3101	4600	N	N	5186	**10803**	9400	N	**Y**	B	**F**
	2030 w/o CCR	1981	2329	4700	N	N	2363	3383	4600	N	N	6397	**10548**	9400	N	N	C	**F**
	2030 w CCR	1264	790	4700	N	N	1959	3025	4600	N	N	5050	10325	11600	N	N	B	C

Footnotes:

a. Volumes factored up to account for peak hour factor (PHF) and truck percentages and are expressed in vehicles per hour (vph).

b. Capacity based on methodology found in Chapter 25 of the 2000 Highway Capacity Manual (HCM). For mainlines, capacity is referred as Ramp junction capacity at the merge influence area.

c. Ramp junction operations dependent on freeway mainline operations and ramp capacity.

TABLE 7–7
RAMP DIVERGE OPERATIONS

Ramp Diverge Location	Model Run: Scenario	Mainline Facility Before Diverge (Rightmost 2 Lanes Only)					Mainline Facility at Off-Ramp Diverge (Off-ramp pc/h volume)					Mainline Facility After Diverge (All Mainline Lanes)					Ramp Junction LOS[c]	
		Volume [a]			LOS F?		Volume			LOS F?		Volume			LOS F?			
		AM	PM	Capacity [b]	AM	PM	AM	PM	Capacity	AM	PM	AM	PM	Capacity	AM	PM	AM	PM
I-805 NB Off-Ramp to Vista Sorrento Pkwy	*Existing*	4182	2496	4400	N	N	1305	432	2000	N	N	6598	4735	9400	N	N	**E**	C
	2010 w/o CCR	**5063**	3047	4400	Y	N	1968	903	2000	N	N	7099	4918	9400	N	N	**F**	C
	2010 w CCR	**5086**	3069	4400	Y	N	1991	915	2000	N	N	7099	4941	9400	N	N	**F**	C
	2010 w CCR with North DAR's	**5015**	2945	4400	Y	N	1910	891	2000	N	N	7041	4710	9400	N	N	**F**	C
	2030 w/o CCR	**5915**	3581	4400	Y	N	**2119**	984	2000	Y	N	8707	5956	9400	N	N	**F**	D
	2030 w CCR	**5030**	3151	4400	Y	N	**2142**	996	2000	Y	N	6623	4943	10400	N	N	**F**	C
I-805 NB Off-Ramp to Mira Mesa Blvd	*Existing*	**5240**	2842	4400	Y	N	3185	1499	3800	N	N	7903	5167	9400	N	N	**F**	B
	2010 w/o CCR	**5089**	2787	4400	Y	N	2732	1274	3800	N	N	9067	5821	9400	N	N	**F**	B
	2010 w CCR	**5072**	2762	4400	Y	N	2709	1239	3800	N	N	9090	5856	9400	N	N	**F**	B
	2010 w CCR with North DAR's	**5055**	2753	4400	Y	N	2686	1227	3800	N	N	9090	5856	9400	N	N	**F**	B
	2030 w/o CCR	**5744**	3135	4400	Y	N	2929	1331	3800	N	N	10827	6940	9400	**Y**	N	**F**	B
	2030 w CCR	**5709**	3137	4400	Y	N	2860	1320	3800	N	N	**10956**	6987	**10400**	**Y**	N	**F**	B
I-805 SB Off-ramp to Sorrento Valley Rd	*Existing*	2737	2767	4400	N	N	1879	1150	3800	N	N	3301	6220	9400	N	N	B	B
	2010 w/o CCR	2748	2944	4400	N	N	1887	1204	3800	N	N	3310	6693	9400	N	N	B	B
	2010 w CCR	3109	2944	4400	N	N	2269	1204	3800	N	N	3229	6693	9400	N	N	B	B
	2010 w CCR with North DAR's	2802	2755	4400	N	N	2038	1065	3800	N	N	2939	6577	9400	N	N	B	B
	2030 w/o CCR	3055	3418	4400	N	N	2015	1308	3800	N	N	4000	8116	9400	N	N	B	**F**[d]
	2030 w CCR	3139	2954	4400	N	N	2350	1308	3800	N	N	3033	6331	10400	N	N	B	B

Footnotes:

a. Volumes factored up to account for peak hour factor (PHF) and truck percentages and are expressed in vehicles per hour (vph).

b. Capacity based on methodology found in Chapter 25 of the 2000 Highway Capacity Manual (HCM). For mainlines, capacity is referred as Ramp junction capacity at the merge influence area.

c. Ramp junction operations dependent on freeway mainline operations and ramp capacity.

d. The freeway mainline flow upstream of the diverge segment is calculated to operate over capacity.

7.8 Ramp Meters

Ramp meters were analyzed for Year 2010 without Carroll Canyon Road Extension Scenario. *Table 7–8* shows the peak hour analysis results for the freeway segments in the project area. As shown in *Table 7–8*, all freeway ramp meters in the project area are calculated to operate at acceptable conditions or better with the following exceptions:

- I-805 Southbound On-ramp from Mira Mesa Boulevard
- I-805 Northbound On-ramp from Vista Sorrento Parkway

TABLE 7–8
RAMP METER OPERATIONS (FIXED RATE METHOD)

Location	Condition	Min./ Max. Rate	Peak Hour Demand[b]	Peak Hour Demand/ Lane [b]	Meter Flow Rate/ Lane [a]	Excess Demand	Delay (min)	Queue (feet)
I-805 Southbound On-Ramp from Sorrento Valley Rd (3:00 PM - 7:00 PM)	Existing	Min	808	687	509	178	21	4445
		Max	808	687	996	0	0	0
	2010 Without CCR	Min	810	689	509	180	21	4488
		Max	810	689	996	0	0	0
	2010 With CCR [d]	Min	1810	905	509	396	47	9900
		Max	1810	905	996	0	0	0
	2010 w CCR with North DAR's	Min	1800	900	509	391	46	9775
		Max	1800	900	996	0	0	0
	2030 Without CCR	Min	910	774	509	265	31	6613
		Max	910	774	996	0	0	0
	2030 With CCR [d]	Min	1930	965	509	456	54	11400
		Max	1930	965	996	0	0	0
I-805 Southbound On-Ramp from Mira Mesa Blvd (3:00 PM - 6:30 PM)	Existing	Min	2709	1084	828	256	19	6390
		Max	2709	1084	996	88	5	2190
	2010 Without CCR	Min	2870	1148	828	320	23	8000
		Max	2870	1148	996	152	9	3800
	2010 With CCR [d]	Min	1870	748	828	0	0	0
		Max	1870	748	996	0	0	0
	2010 w CCR with North DAR's	Min	1850	740	828	0	0	0
		Max	1850	740	996	0	0	0
	2030 Without CCR	Min	3110	1244	828	416	30	10400
		Max	3110	1244	996	248	15	6200
	2030 With CCR [d]	Min	2030	812	828	0	0	0
		Max	2030	812	996	0	0	0
I-805 Northbound On-Ramp from Vista Sorrento Parkway (3:00 PM - 7:00 PM)	Existing	Min	1163	605	197	408	124	10194
		Max	1163	605	348	257	44	6419
	2010 Without CCR	Min	1260	655	197	458	140	11455
		Max	1260	655	348	307	53	7680
	2010 With CCR [d]	Min	1360	707	197	510	155	12755
		Max	1360	707	348	359	62	8980
	2010 w CCR with North DAR's	Min	1160	603	197	406	124	10155
		Max	1160	603	348	255	44	6380
	2030 Without CCR	Min	1340	697	197	500	152	12495
		Max	1340	697	348	349	60	8720
	2030 With CCR [d]	Min	1440	749	197	552	168	13795
		Max	1440	749	348	401	69	10020

Footnotes:

a. Meter Rates obtained from CALTRANS (Appendix C).
b. Peak Hour Volumes obtained from the existing ramp rata.
c. Lane Utilization Factor obtained from available ramp data.
d. Assumed to have 3-lanes (2 SOV + 1 HOV) and a lane utilization factor of 50% was utilized.
e. Ramp meters were assumed to be operating at unacceptable conditions, if the traffic peak hour demand/lane/hour is greater than the maximum meter rate.

8.0 YEAR 2010 (WITH CARROLL CANYON ROAD EXTENSION) ANALYSIS

8.1 Forecasted Traffic Volumes

In order to forecast future traffic volumes Year 2010 with Carroll Canyon Road SANDAG Model run output was utilized. All the traffic engineering principles and methodologies discussed in *Section 7.1* were utilized to forecast volumes for this scenario. To determine the traffic volume changes due to the Carroll Canyon Road Extension, Mira Sorrento Place and the I-805 northbound off-ramp to Vista Sorrento Parkway, Select Link Assignments were utilized (see *Appendix J*).

Most of the forecast ADT's were utilized as reported by the SANDAG model. However, some volumes were revised to ensure that the volumes were as accurate as possible. Particular attention was paid to the relative magnitude of the I-805 southbound on-ramps after Carroll Canyon Road is extended. It is believed that the split between the on ramps will be close to 50/50 when congestion is highest, during the PM peak. A slightly smaller spread (with more traffic on the Mira Mesa Boulevard westbound to southbound on-ramp) is expected during the balance of the day and therefore the ADT is forecasted higher on the westbound to I-805 southbound on-ramp.

Figure 8–1 illustrates the intersection lane configurations utilized in the analysis. *Figure 8–2* illustrates forecasted 2010 traffic volumes with the Carroll Canyon Road extension.

8.2 Intersections

Intersection capacity analyses were conducted for the study intersections for Year 2010 with Carroll Canyon Road Extension Scenario. *Appendix P* contains the intersection calculation worksheets.

Table 7–1 summarizes signalized intersections level of service. As seen in *Table 7–1*, all intersections are calculated to currently operate at LOS D or better during both the AM and PM peak hours except the following signalized intersections:

- Sorrento Valley Road/ I-805 Southbound Off ramp/Carroll Canyon Road (LOS F during PM peak hour)
- Mira Mesa Boulevard/ Vista Sorrento Parkway/ I-805 Northbound Off ramp (LOS F during AM peak hour)
- Mira Mesa Boulevard / Scranton Road (LOS F during both AM and PM peak hour)
- Mira Mesa Boulevard / Pacific Heights Boulevard (LOS F during PM peak hour)
- Mira Sorrento Place/Scranton Road (LOS E during both AM and PM peak hour)

Table 7–2 summarizes the queuing information on all I-805 / Mira Mesa Boulevard / Sorrento Valley Road interchange off-ramps. Appendix Q contains the queuing calculation worksheets.

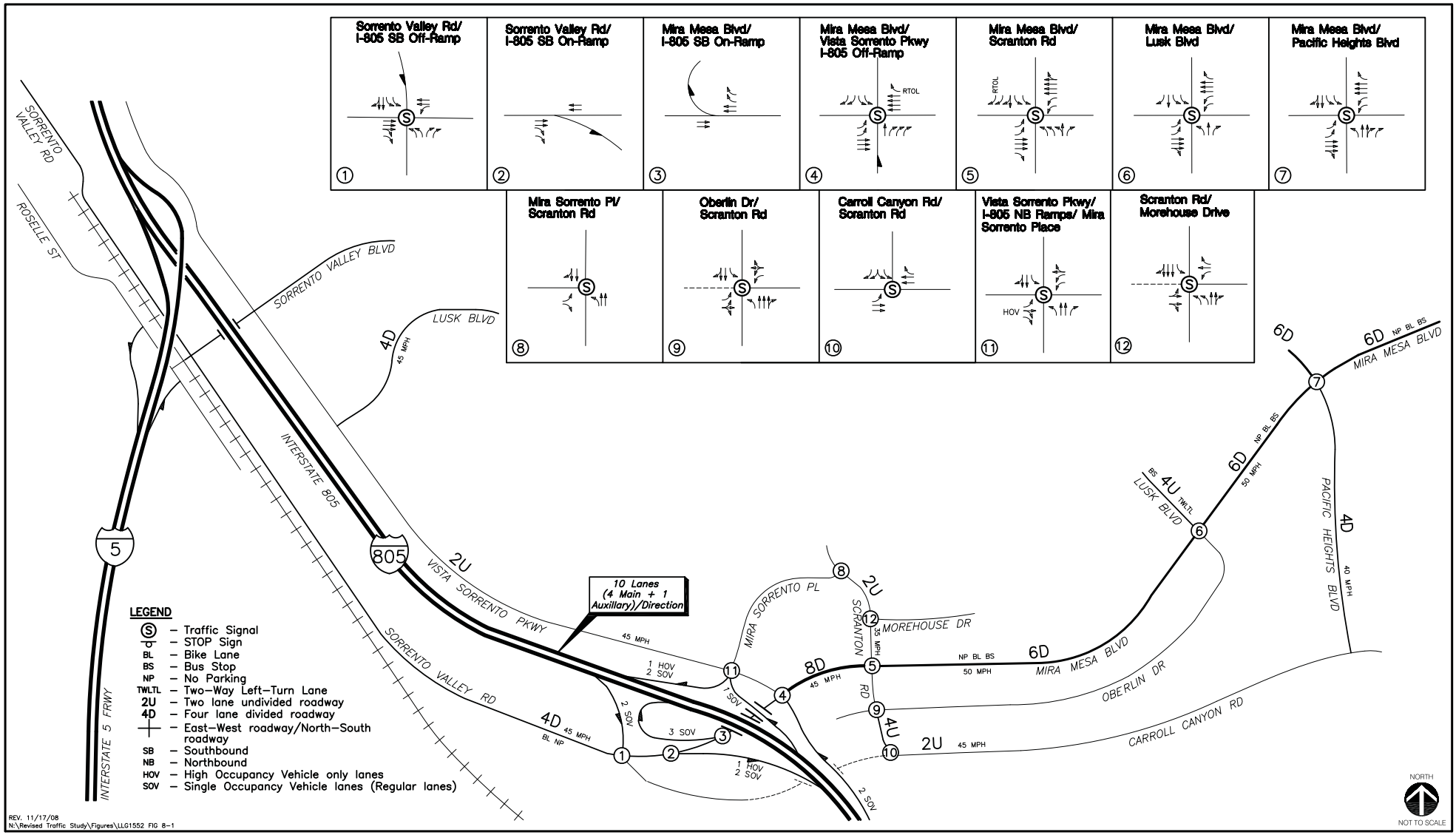

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Figure 8-1

Roadway & Intersection Geometry
2010 With Carroll Canyon Rd Extension

I-805/Mira Mesa Blvd/ Sorrento Valley Rd Interchange

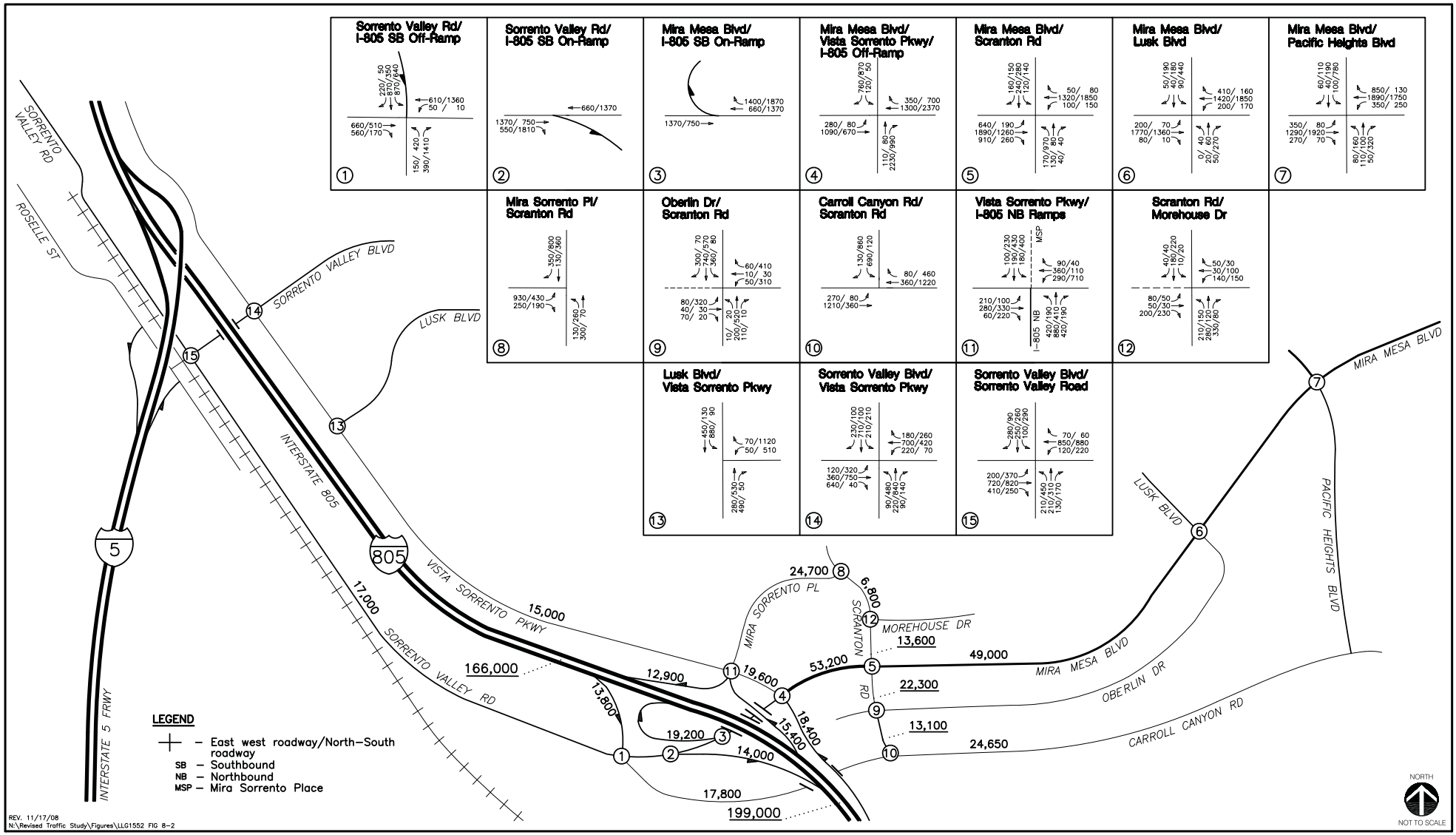

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Figure 8-2

2010 Scenario
With Carroll Canyon Rd Extension
AM/PM Peak Hours & ADTs
I-805/Mira Mesa Blvd/
Sorrento Valley Rd Interchange

8.3 Intersection Lane Vehicle (ILV) Analysis

Table 7–3 summarizes the ILV analysis results for the signalized intersections on I-805/ Mira Mesa Boulevard / Sorrento Valley Road interchange off-ramps. As seen in *Table 7–3*, all intersections are calculated to operate "Over Capacity" during both AM and PM peak hours. Appendix R contains the ILV analysis worksheets.

8.4 Street Segments

Street segment analyses were conducted for roadways in the study area for Year 2010 with Carroll Canyon Road Extension Scenario. Table 7-4 reports street segment operations on a daily basis. As seen in *Table 7–4*, all study area street segments are calculated to operate at LOS D or better except the following:

- Vista Sorrento Parkway, Lusk Boulevard to I-805 Northbound ramps (LOS E)
- Carroll Canyon Road, East and West of Scranton Road (LOS F)

8.5 Freeway Facilities

Freeway segments were analyzed for Year 2010 with Carroll Canyon Road Extension Scenario. *Table 8–1* shows the peak hour analysis results for the freeway segments in the project area. As shown in *Table 8–1*, all freeway segments in the project area are calculated to operate at LOS D or better with the following exceptions:

- I-805 Northbound, South of Mira Mesa Blvd Interchange (LOS F(0) in AM Peak Hour)
- I-805 Southbound, South of Mira Mesa Blvd Interchange (LOS F(0) in PM Peak Hour)

8.6 Merge Sections

Ramp merge sections (i.e. on-ramps) were analyzed for Year 2010 with Carroll Canyon Road Extension Scenario. Appendix S contains the ramp merge calculation sheets. *Table 7–6* shows the merge analysis results for the freeway segments in the project area. As shown in *Table 7–6*, all freeway segments in the project area are calculated to operate at LOS D or better with the following exception:

- I-805 Southbound On-ramp from Mira Mesa Boulevard (LOS F during PM Peak Hour)
- I-805 Southbound On-ramp from Sorrento Valley Road (LOS F during PM Peak Hour)

TABLE 8–1
YEAR 2010 (WITH CARROLL CYN RD EXT) FREEWAY SEGMENT OPERATIONS

Freeway and Segment	Direction	Number of Lanes	Capacity	ADT	Peak Hour % (K)		Dir. Split % (D)		Truck Factor	Peak Hour Volume		V/C		LOS	
					AM	PM	AM	PM		AM	PM	AM	PM	AM	PM
I-805 North of Mira Mesa Blvd Interchange	NB Mainlines	4M+1A	9,200	166,000	0.0634	0.0691	0.5842	0.4521	0.921	6671	5628	0.725	0.612	C	B
	SB Mainlines	4M+1A	9,200	166,000	0.0634	0.0691	0.4158	0.5479	0.921	4749	6821	0.516	0.741	B	C
I-805 North of Mira Mesa Blvd Interchange	NB Mainlines	4M+1A	9,200	166,000	0.0703	0.0734	0.6826	0.3931	0.937	10191	6128	1.108	0.666	F(0)	C
	SB Mainlines	4M+1A	9,200	166,000	0.0703	0.0734	0.3174	0.6069	0.937	4739	9461	0.515	1.028	B	F(0)

General Notes:

1. Capacity calculated at 2000 vph per lane and 1200 vph per aux lane (M: Mainline, A: Aux. Ex. 4M+1A=4 Mainline + 1 Aux)
2. Existing ADT Volumes from CALTRANS
3. Peak Hour Percentage (K) and Direction Split (D) for I-805 South of Mira Mesa Blvd Interchange was obtained from Caltrans "2005 Peak Hour Volume Data" Report.
4. Peak Hour Percentage (K) and Direction Split (D) for I-805 North of Mira Mesa Blvd Interchange not available from Caltrans. Therefore, they were estimated based on the 2010 traffic counts on the ramps.
5. Truck Factor was obtained from "2004 Annual Average Daily Truck Traffic on the California State Highway System", August 2005
6. Peak Hour Volume = ((ADT)(K)(D)/Truck Factor)
7. V/C = ((ADT)(K)(D)/Truck Factor/Capacity)

LOS	V/C
A	<0.41
B	0.62
C	0.8
C	0.8
D	0.92
E	1
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

8.7 Diverge Sections

Ramp diverge sections (i.e. off-ramps) were analyzed for Year 2010 with Carroll Canyon Road Extension Scenario. Appendix T contains the ramp diverge calculation sheets. *Table 7–7* shows the diverge analysis results for the freeway segments in the project area. As shown in *Table 7–7*, all freeway segments in the project area are calculated to operate at LOS D or better with the following exceptions:

- I-805 Northbound Off-ramp to Vista Sorrento Parkway (LOS F during AM Peak Hour)
- I-805 Northbound Off-ramp to Mira Mesa Boulevard (LOS F during AM Peak Hour)

8.8 Ramp Meters

Ramp meters were analyzed for Year 2010 with Carroll Canyon Road Extension Scenario. *Table 7–8* shows the peak hour analysis results for the freeway segments in the project area. As shown in *Table 7–8*, all freeway ramp meters in the project area are calculated to operate at acceptable conditions or better with the following exception:

- I-805 Northbound On-ramp from Vista Sorrento Parkway

9.0 YEAR 2010 (WITH CARROLL CANYON ROAD EXTENSION WITH NORTH FACING CARROLL CYN RD DAR'S) ANALYSIS

9.1 Forecasted Traffic Volumes

In order to forecast future traffic volumes, a Year 2010 with Carroll Canyon Road with north facing Carroll Cyn Rd DAR SANDAG Model run output was utilized. All the traffic engineering principles and methodologies discussed in *Section 7.1* were utilized to forecast volumes for this scenario. To determine the traffic volume changes due to the North Facing DAR's, Carroll Canyon Road Extension, Mira Sorrento Place and the I-805 northbound off-ramp to Vista Sorrento Parkway, Select Link Assignments were utilized (see *Appendix J*).

Most of the forecast ADT's were utilized as reported by the SANDAG model. However, some volumes were revised to ensure that the volumes were as accurate as possible. *Figure 9-1* illustrates the intersection lane configurations utilized in the analysis. *Figure 9-2* illustrates forecasted 2010 traffic volumes with the Carroll Canyon Road extension with north facing Carroll Cyn Rd DAR's.

9.2 Intersections

Intersection capacity analyses were conducted for the study intersections for Year 2010 with Carroll Canyon Road Extension with North facing DAR's scenario. *Appendix 4A* contains the intersection calculation worksheets.

Table 7–1 summarizes signalized intersections level of service. As seen in *Table 7–1*, all intersections are calculated to currently operate at LOS D or better during both the AM and PM peak hours except the following signalized intersections:

- Sorrento Valley Road/ I-805 Southbound Off ramp/Carroll Canyon Road (LOS F during PM peak hour)
- Mira Mesa Boulevard/ Vista Sorrento Parkway/ I-805 Northbound Off ramp (LOS F during AM peak hour)
- Mira Mesa Boulevard / Scranton Road (LOS F during both AM and PM peak hour)
- Mira Mesa Boulevard / Pacific Heights Boulevard (LOS F during PM peak hour)
- Mira Sorrento Place/Scranton Road (LOS E during both AM and PM peak hour)

Table 7–2 summarizes the queuing information on all I-805 / Mira Mesa Boulevard / Sorrento Valley Road interchange off-ramps. *Appendix 4B* contains the queuing calculation worksheets.

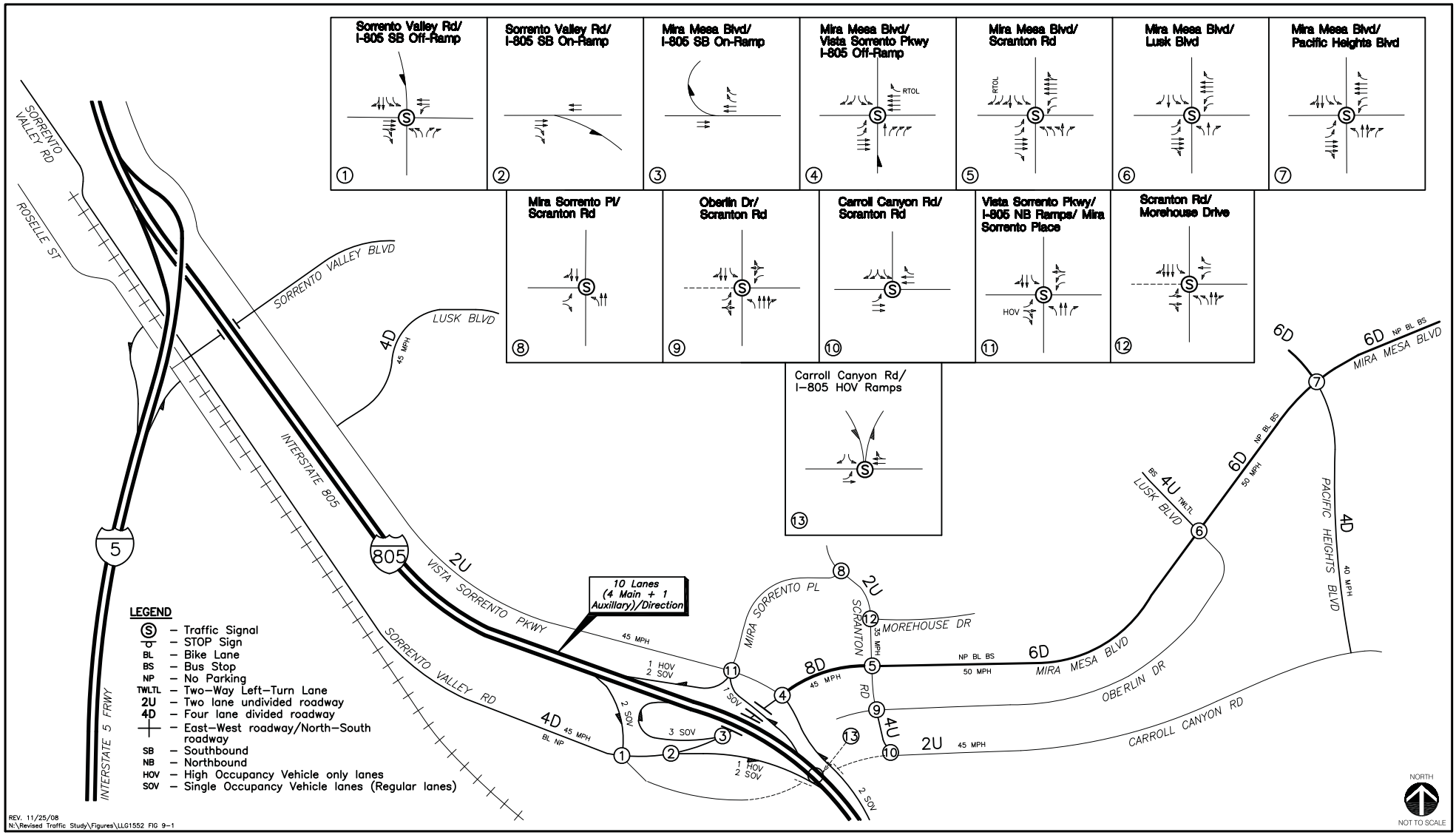

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Figure 9-1

2010 Scenario With Carroll Canyon Rd Extension With North Facing Direct Access Ramp Roadway & Intersection Geometry

I-805/Mira Mesa Blvd/ Sorrento Valley Rd Interchange

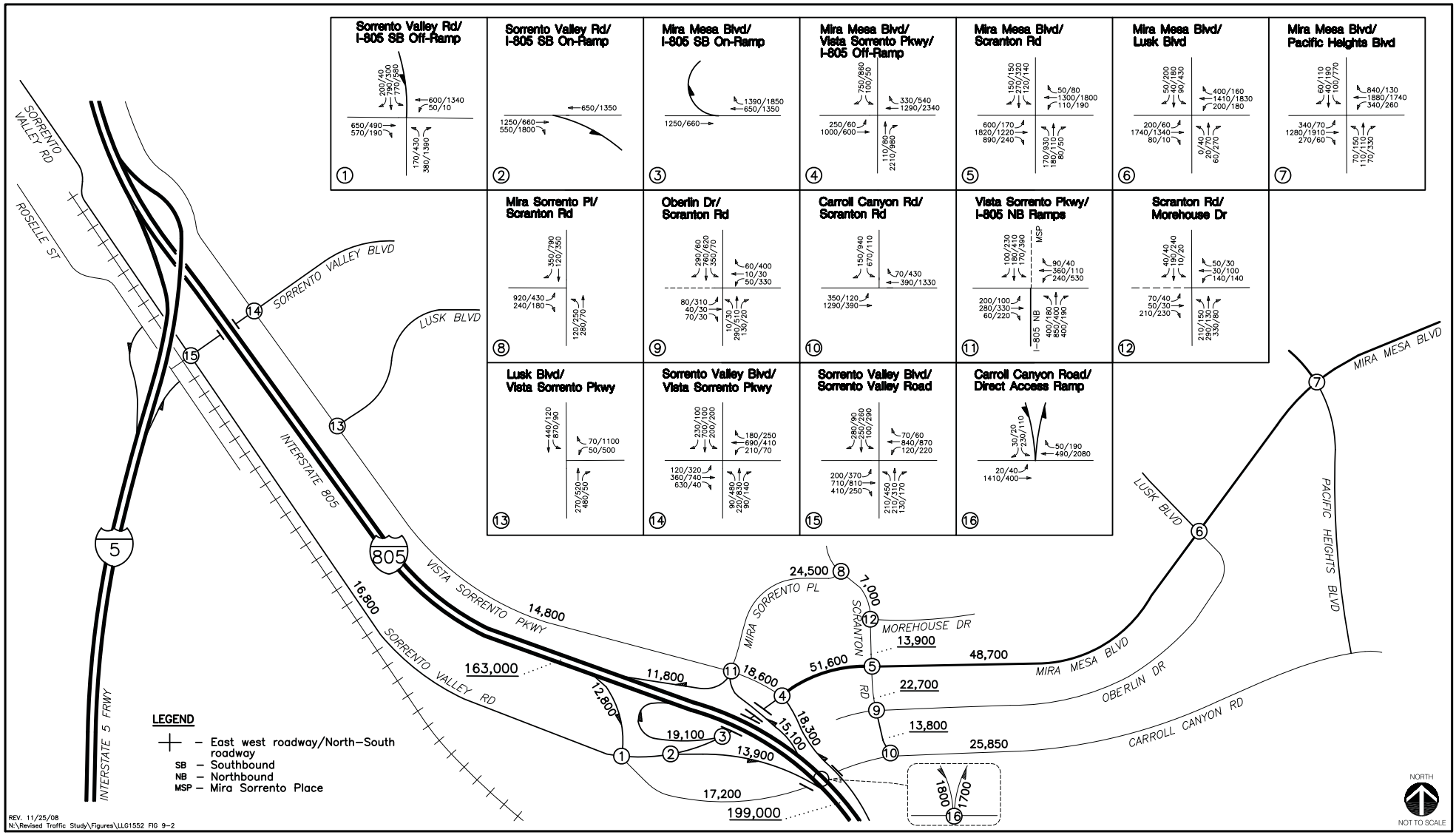

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Figure 9-2

2010 Scenario With Carroll Canyon Rd Extension With North Facing Direct Access Ramp AM/PM Peak Hours & ADTs

I-805/Mira Mesa Blvd/ Sorrento Valley Rd Interchange

9.3 Intersection Lane Vehicle (ILV) Analysis

Table 7–3 summarizes the ILV analysis results for the signalized intersections on I-805/ Mira Mesa Boulevard / Sorrento Valley Road interchange off-ramps. As seen in *Table 7–3*, all intersections are calculated to operate "Over Capacity" during both AM and PM peak hours except for I-805 NB ramps/ Vista Sorrento Parkway which is calculated to operate "at capacity'. *Appendix 4C* contains the ILV analysis worksheets.

9.4 Street Segments

Street segment analyses were conducted for roadways in the study area for Year 2010 with Carroll Canyon Road Extension with North facing DAR's scenario. *Table 7–4* reports street segment operations on a daily basis. As seen in *Table 7–4*, all study area street segments are calculated to operate at LOS D or better except the following:

- Vista Sorrento Parkway, Lusk Boulevard to I-805 Northbound ramps (LOS E)
- Carroll Canyon Road, East and West of Scranton Road (LOS F)

9.5 Freeway Facilities

Freeway segments were analyzed for Year 2010 with Carroll Canyon Road Extension with North facing DAR's scenario. *Table 9–1* shows the peak hour analysis results for the freeway segments in the project area. As shown in *Table 9–1*, I-805 – North of Mira Boulevard is calculated to operate at LOS D or better in both the direction in the AM/PM peak hours.

I-805 south of Mira Mesa Boulevard interchange is calculated to operate at LOS E or worse for the following scenarios:

- I-805 Northbound, South of Mira Mesa Blvd Interchange (F(0) in AM Peak Hour)
- I-805 Southbound, South of Mira Mesa Blvd Interchange (LOS F(0) in PM Peak)

9.6 Merge Sections

Ramp merge sections (i.e. on-ramps) were analyzed for Year 2010 with Carroll Canyon Road Extension with North facing DAR's scenario. *Appendix 4D* contains the ramp merge calculation sheets. *Table 7–6* shows the merge analysis results for the freeway segments in the project area. As shown in *Table 7–6*, all freeway segments in the project area are calculated to operate at LOS D or better with the following exception:

- I-805 Southbound On-ramp from Mira Mesa Boulevard (LOS F during PM Peak Hour)
- I-805 Southbound On-ramp from Sorrento Valley Road (LOS F during PM Peak Hour)

TABLE 9–1
YEAR 2010 (WITH CARROLL CYN RD EXT WITH NORTH FACING DAR'S) FREEWAY SEGMENT OPERATIONS

Freeway and Segment	Direction	Number of Lanes	Capacity	ADT	Peak Hour % (K)		Dir. Split % (D)		Truck Factor	Peak Hour Volume		V/C		LOS	
					AM	PM	AM	PM		AM	PM	AM	PM	AM	PM
I-805 North of Mira Mesa Blvd Interchange	NB Mainlines	4M+1A	10,400	163,000	0.0619	0.0684	0.5978	0.4468	0.921	6551	5408	0.630	0.520	C	B
	SB Mainlines	4M+1A	10,400	163,000	0.0619	0.0684	0.4022	0.5532	0.921	4408	6698	0.424	0.644	B	C
I-805 North of Mira Mesa Blvd Interchange	NB Mainlines	4M+1A	9,200	199,000	0.0703	0.0734	0.6826	0.3931	0.937	10191	6128	1.108	0.666	F(0)	C
	SB Mainlines	4M+1A	9,200	199,000	0.0703	0.0734	0.3174	0.6069	0.937	4739	9461	0.515	1.028	B	F(0)

General Notes:

1. Capacity calculated at 2000 vph per lane and 1200 vph per aux lane (M: Mainline, A: Aux. Ex. 4M+1A=4 Mainline + 1 Aux)
2. Existing ADT Volumes from CALTRANS
3. Peak Hour Percentage (K) and Direction Split (D) for I-805 South of Mira Mesa Blvd Interchange was obtained from Caltrans "2005 Peak Hour Volume Data" Report.
4. Peak Hour Percentage (K) and Direction Split (D) for I-805 North of Mira Mesa Blvd Interchange not available from Caltrans. Therefore, they were estimated based on the 2010 traffic counts on the ramps.
5. Truck Factor was obtained from "2004 Annual Average Daily Truck Traffic on the California State Highway System", August 2005
6. Peak Hour Volume = ((ADT)(K)(D)/Truck Factor)
7. V/C = ((ADT)(K)(D)/Truck Factor/Capacity)

LOS	V/C
A	<0.41
B	0.62
C	0.8
C	0.8
D	0.92
E	1
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

9.7 Diverge Sections

Ramp diverge sections (i.e. off-ramps) were analyzed for Year 2010 with Carroll Canyon Road Extension with North facing DAR's scenario. *Appendix 4E* contains the ramp diverge calculation sheets. *Table 7–7* shows the diverge analysis results for the freeway segments in the project area. As shown in *Table 7–7*, all freeway segments in the project area are calculated to operate at LOS D or better with the following exceptions:

- I-805 Northbound Off-ramp to Vista Sorrento Parkway (LOS F during AM Peak Hour)
- I-805 Northbound Off-ramp to Mira Mesa Boulevard (LOS F during AM Peak Hour)

9.8 Ramp Meters

Ramp meters were analyzed for Year 2010 with Carroll Canyon Road Extension with North facing DAR's scenario. *Table 7–8* shows the peak hour analysis results for the freeway segments in the project area. As shown in *Table 7–8*, all freeway ramp meters in the project area are calculated to operate at acceptable conditions or better with the following exception:

- I-805 Northbound On-ramp from Vista Sorrento Parkway

10.0 YEAR 2030 (WITHOUT CARROLL CANYON ROAD EXTENSION) ANALYSIS

10.1 Forecasted Traffic Volumes

In order to forecast future traffic volumes Year 2030 without Carroll Canyon Road SANDAG Model run output was utilized. All the traffic engineering principles and methodologies discussed in *Section 7.1* were utilized to forecast volumes for this scenario. *Figure 10–1* illustrates the intersection lane configurations utilized in the analysis. *Figure 10–2* illustrates forecasted 2030 traffic volumes without the Carroll Canyon Road extension.

10.2 Intersections

Intersection capacity analyses were conducted for the study intersections for Year 2030 without Carroll Canyon Road Extension Scenario. Appendix U contains the intersection calculation worksheets. *Table 7–1* summarizes signalized intersections level of service. As seen in *Table 7–1*, all intersections are calculated to operate at mid LOS D or better during both the AM and PM peak hours except the following signalized intersections:

- Sorrento Valley Road/ I-805 Southbound Off ramp/Carroll Canyon Road (LOS E during PM peak hour)
- Mira Mesa Boulevard/ Vista Sorrento Parkway/ I-805 Northbound Off ramp (LOS F during both AM and PM peak hour)
- Mira Mesa Boulevard / Scranton Road (LOS F during both AM and PM peak hour)
- Mira Mesa Boulevard / Pacific Heights Boulevard (LOS E during AM peak hour and LOS F during PM peak hour)
- Mira Sorrento Place/Scranton Road (LOS F during both AM and PM peak hour)
- Oberlin Drive/Scranton Road (LOS F during PM peak hour)
- Vista Sorrento Parkway / I-805 Northbound Hook Ramps (LOS E during both AM and PM peak hour)

Table 7–2 summarizes the queuing information on all I-805 / Mira Mesa Boulevard / Sorrento Valley Road interchange off-ramps. *Appendix V* contains the queuing calculation worksheets.

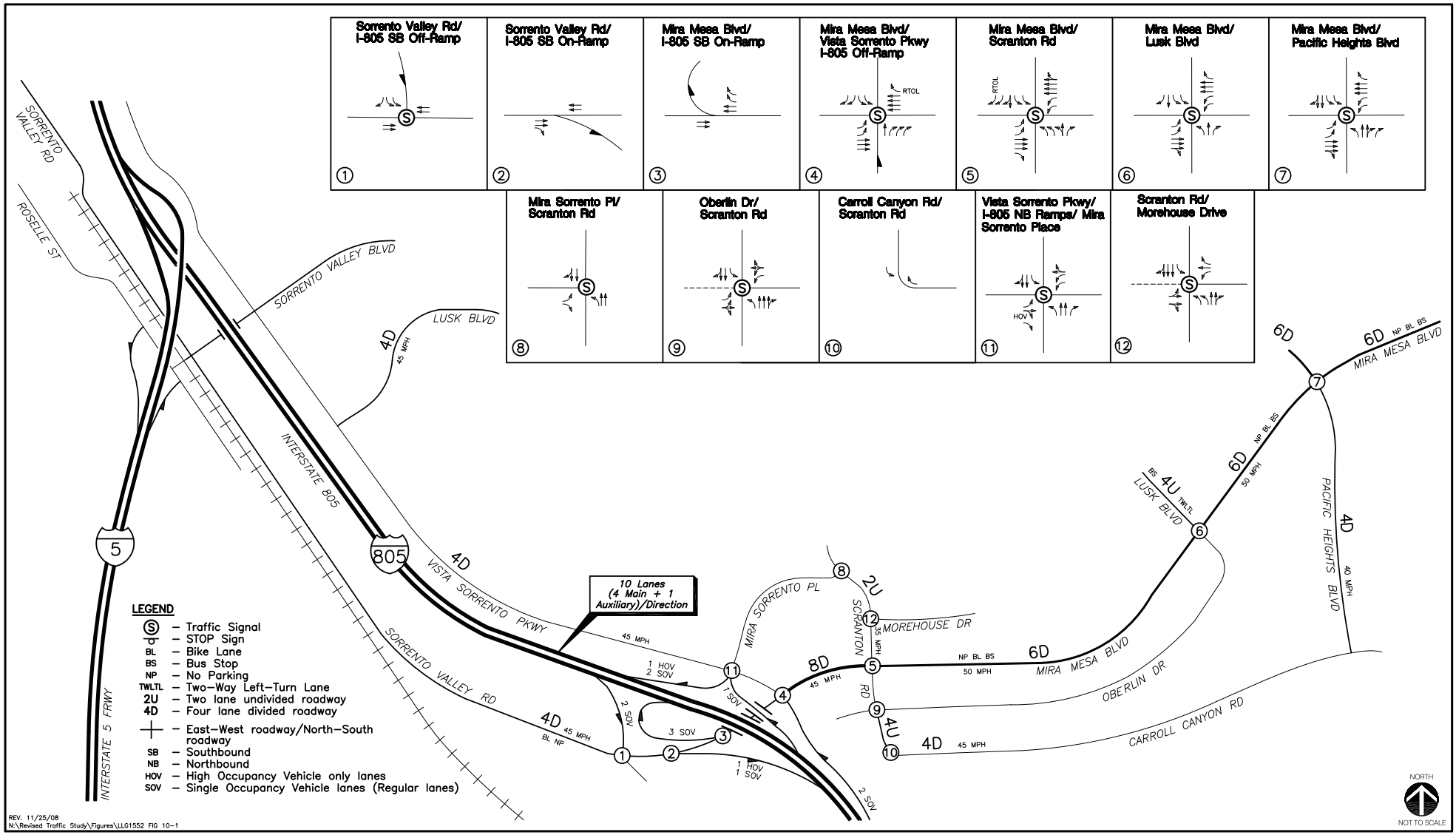

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Figure 10-1

Roadway & Intersection Geometry
2030 Without Carroll Canyon Rd Extension

I-805/Mira Mesa Blvd/
Sorrento Valley Rd Interchange

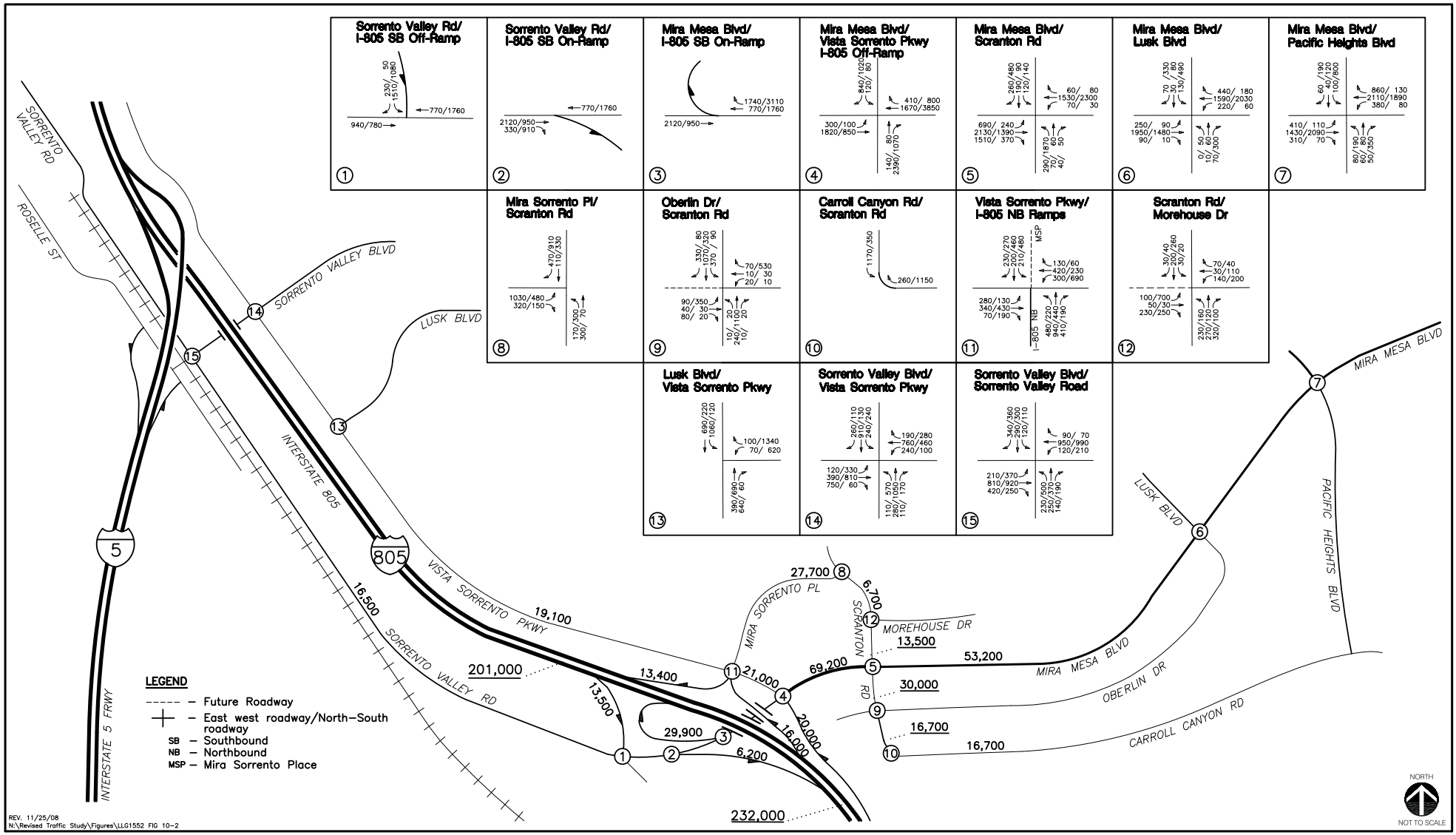

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Figure 10-2

2030 Scenario
Without Carroll Canyon Rd Extension
AM/PM Peak Hours & ADTs
I-805/Mira Mesa Blvd/ Sorrento Valley Rd Interchange

10.3 Intersection Lane Vehicle (ILV) Analysis

Table 7–3 summarizes the ILV analysis results for the signalized intersections on I-805/ Mira Mesa Boulevard / Sorrento Valley Road interchange off-ramps. As seen in *Table 7–3*, all intersections are calculated to operate "at Capacity" or better during both the AM and PM peak hours except the following:

- I-805 Northbound Off-Ramp / Mira Mesa Boulevard / Vista Sorrento Parkway (Over Capacity during both AM and PM peak hours)
- I-805 Northbound Ramps / Vista Sorrento Parkway (Over Capacity during both AM and PM peak hours)

Appendix W contains the ILV analysis worksheets.

10.4 Street Segments

Street segment analyses were conducted for roadways in the study area for Year 2030 without Carroll Canyon Road Extension Scenario. *Table 7–4* reports street segment operations on a daily basis. As seen in *Table 7–4*, all study area street segments are calculated to operate at LOS D or better except the following:

- Mira Mesa Boulevard, Vista Sorrento Parkway to Scranton Road (LOS E)

10.5 Freeway Facilities

Freeway segments were analyzed for Year 2030 without Carroll Canyon Road Extension Scenario. Analysis was conducted for three different freeway lane configurations in Year 2030. *Table 10–1* shows the peak hour analysis results for the freeway segments in the project area. As shown in *Table 10–1*, all freeway segments in the project area are calculated to operate at LOS D or better with the following exceptions:

- I-805 Northbound, South of Mira Mesa Blvd Interchange (LOS F(1) in AM Peak Hour for 4 Mainlines + 1 Auxiliary Lane Option & LOS F(0) in AM Peak Hour for 4 Mainlines + 1 HOV + 1 Auxiliary Lane Option)

- I-805 Southbound, South of Mira Mesa Blvd Interchange (LOS F(0) in PM Peak Hour for 4 Mainlines + 2 Auxiliary Lane Option & LOS E in PM Peak Hour for 4 Mainlines + 1 HOV + 2 Auxiliary Lane Option)

TABLE 10–1
YEAR 2030 (WITHOUT CARROLL CYN RD EXT) FREEWAY SEGMENT OPERATIONS

Freeway and Segment	Direction	Number of Lanes	Capacity	ADT	Peak Hour % (K)		Dir. Split % (D)		Truck Factor	Peak Hour Volume		V/C		LOS	
					AM	PM	AM	PM		AM	PM	AM	PM	AM	PM
I-805 North of Mira Mesa Blvd Interchange	NB Mainlines	4M+1A	9,200	201,000	0.0609	0.0670	0.6090	0.4434	0.921	8091	6484	0.880	0.705	D	C
		4M+1 H+1A	10,400	201,000	0.0609	0.0670	0.6090	0.4434	0.921	8091	6484	0.778	0.623	C	C
		5M+2 H+1A	13,600	201,000	0.0609	0.0670	0.6090	0.4434	0.921	8091	6484	0.595	0.477	B	B
	SB Mainlines	4M+1A	9,200	201,000	0.0609	0.0670	0.3910	0.5566	0.921	5195	8140	0.565	0.885	B	D
		4M+1H+1A	10,400	201,000	0.0609	0.0670	0.3910	0.5566	0.921	5195	8140	0.499	0.783	B	C
		5M+2 H+1A	13,600	201,000	0.0609	0.0670	0.3910	0.5566	0.921	5195	8140	0.382	0.599	B	B
I-805 South of Mira Mesa Blvd Interchange	NB Mainlines	4M+1A	9,200	232,000	0.0703	0.0734	0.6826	0.3931	0.937	11,881	7144	1.291	0.777	**F(1)**	C
		4M+1H+1A	10,400	232,000	0.0703	0.0734	0.6826	0.3931	0.937	11,881	7144	1.142	0.687	**F(0)**	C
		5M+2 H+1A	13,600	232,000	0.0703	0.0734	0.6826	0.3931	0.937	11,881	7144	0.874	0.525	D	B
	SB Mainlines	4M+2A	10,400	232,000	0.0703	0.0734	0.3174	0.6069	0.937	5525	11,030	0.531	1.061	B	**F(0)**
		4M+1H+2A	11,600	232,000	0.0703	0.0734	0.3174	0.6069	0.937	5525	11,030	0.476	0.951	B	**E**
		5M+2 H+1A	13,600	232,000	0.0703	0.0734	0.3174	0.6069	0.937	5525	11,030	0.406	0.811	B	D

General Notes:

1. Capacity calculated at 2000 vph per lane and 1200 vph per aux lane (M: Mainline, A: Aux. Ex. 4M+1A=4 Mainline + 1 Aux)
2. Existing ADT Volumes from CALTRANS
3. Peak Hour Percentage (K) and Direction Split (D) for I-805 South of Mira Mesa Blvd Interchange was obtained from Caltrans "2005 Peak Hour Volume Data" Report.
4. Peak Hour Percentage (K) and Direction Split (D) for I-805 North of Mira Mesa Blvd Interchange not available from Caltrans. Therefore, they were estimated based on the 2010 traffic counts on the ramps.
5. Truck Factor was obtained from "2004 Annual Average Daily Truck Traffic on the California State Highway System", August 2005
6. Peak Hour Volume = ((ADT)(K)(D)/Truck Factor)
7. V/C = ((ADT)(K)(D)/Truck Factor/Capacity)

LOS	V/C
A	<0.41
B	0.62
C	0.8
C	0.8
D	0.92
E	1
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

10.6 Merge Sections

Ramp merge sections (i.e. on-ramps) were analyzed for Year 2030 without Carroll Canyon Road Extension Scenario. Appendix X contains the ramp merge calculation sheets. *Table 7–6* shows the merge analysis results for the freeway segments in the project area. As shown in *Table 7–6*, all freeway segments in the project area are calculated to operate at LOS D or better with the following exceptions:

- I-805 Southbound On-ramp from Mira Mesa Boulevard (LOS F during PM Peak Hour)

10.7 Diverge Sections

Ramp diverge sections (i.e. off-ramps) were analyzed for Year 2030 without Carroll Canyon Road Extension Scenario. Appendix Y contains the ramp diverge calculation sheets. *Table 7–7* shows the diverge analysis results for the freeway segments in the project area. As shown in *Table 7–7*, all freeway segments in the project area are calculated to operate at LOS D or better with the following exceptions:

- I-805 Northbound Off-ramp to Mira Mesa Boulevard (LOS F during AM Peak Hour)
- I-805 Northbound Off-ramp to Vista Sorrento Parkway (LOS F during AM Peak Hour)
- I-805 Southbound Off-ramp to Sorrento Valley Road (LOS F during PM Peak Hour)

10.8 Ramp Meters

Ramp meters were analyzed for Year 2030 without Carroll Canyon Road Extension Scenario. *Table 7–8* shows the peak hour analysis results for the freeway segments in the project area. As shown in *Table 7–8*, all freeway ramp meters in the project area are calculated to operate at acceptable conditions or better with the following exceptions:

- I-805 Southbound On-ramp from Mira Mesa Boulevard
- I-805 Northbound On-ramp from Vista Sorrento Parkway

11.0 YEAR 2030 (WITH CARROLL CANYON ROAD EXTENSION) ANALYSIS

11.1 Forecasted Traffic Volumes

In order to forecast future traffic volumes Year 2030 with Carroll Canyon Road SANDAG Model run output was utilized. All the traffic engineering principles and methodologies discussed in *Section 7.1* and *Section 8.1* were utilized to forecast volumes for this scenario. *Figure 11–1* illustrates the intersection lane configurations utilized in the analysis. *Figure 11–2* illustrates forecasted 2030 traffic volumes with the Carroll Canyon Road extension.

11.2 Intersections

Intersection capacity analyses were conducted for the study intersections for Year 2030 with Carroll Canyon Road Extension Scenario. *Appendix Z* contains the intersection calculation worksheets. *Table 7–1* summarizes signalized intersections level of service. As seen in *Table 7–1*, all intersections are calculated to operate at mid LOS D or better during both the AM and PM peak hours except the following signalized intersections:

- Sorrento Valley Road/ I-805 Southbound Off ramp/Carroll Canyon Road (LOS F during PM peak hour)
- Mira Mesa Boulevard/ Vista Sorrento Parkway/ I-805 Northbound Off ramp (LOS F during AM peak hour)
- Mira Mesa Boulevard / Scranton Road (LOS F during both AM and PM peak hour)
- Mira Mesa Boulevard / Pacific Heights Boulevard (LOS E during AM peak hour and LOS F during PM peak hour)
- Mira Sorrento Place/Scranton Road (LOS F during both AM and PM peak hour)
- Oberlin Drive/Scranton Road (LOS E during PM peak hour)
- Vista Sorrento Parkway / I-805 Northbound Hook Ramps (LOS E during both AM and PM peak hour)

Table 7–2 summarizes the queuing information on all I-805 / Mira Mesa Boulevard / Sorrento Valley Road interchange off-ramps. *Appendix A*A contains the queuing calculation worksheets.

11.3 Intersection Lane Vehicle (ILV) Analysis

Table 7–3 summarizes the ILV analysis results for the signalized intersections on I-805/ Mira Mesa Boulevard / Sorrento Valley Road interchange off-ramps. As seen in *Table 7–3*, all intersections are calculated to operate "Over Capacity" during both AM and PM peak hours. *Appendix AB* contains the ILV analysis worksheets.

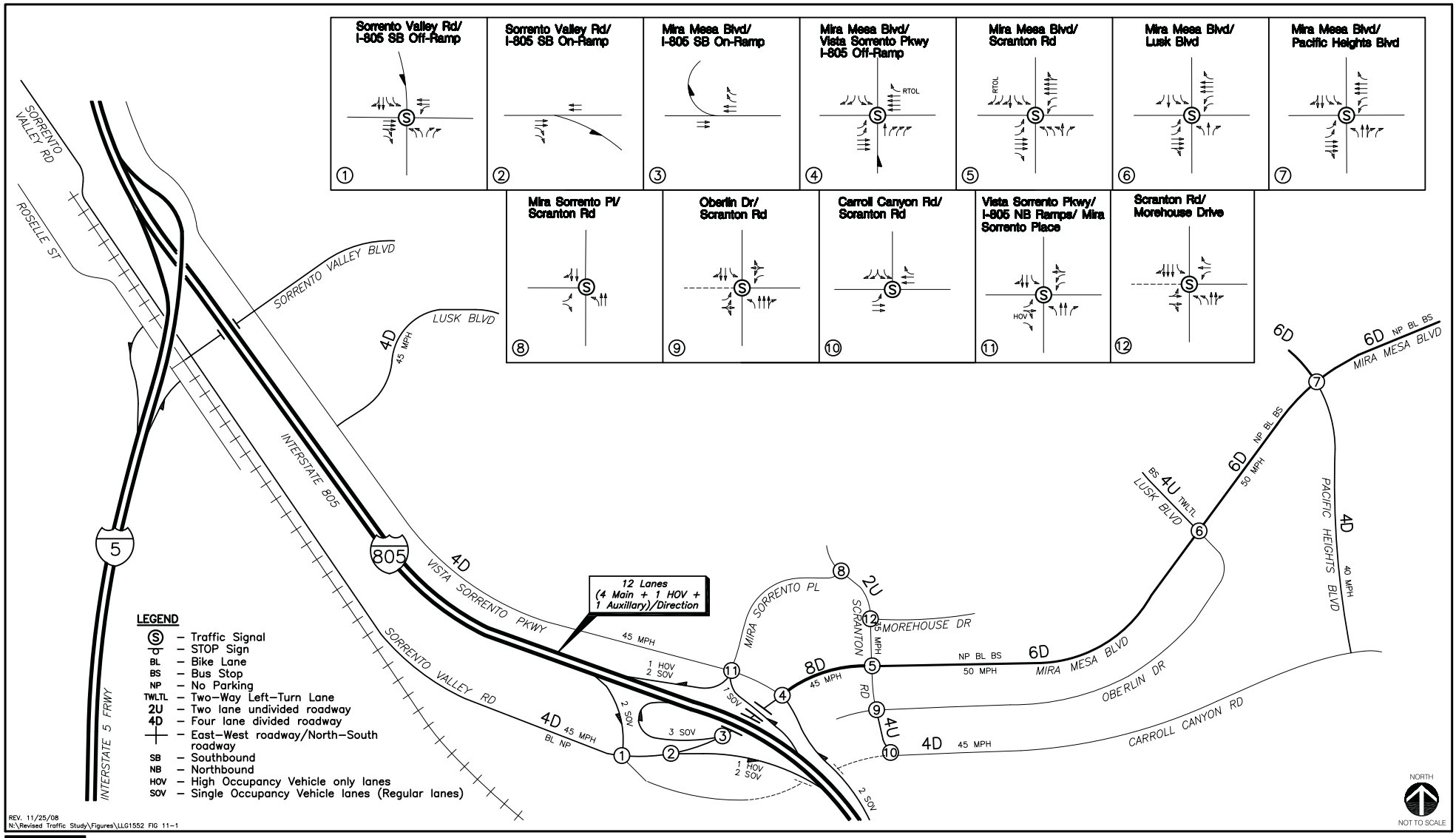

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Figure 11-1

Roadway & Intersection Geometry
2030 With Carroll Canyon Rd Extension

I-805/Mira Mesa Blvd/
Sorrento Valley Rd Interchange

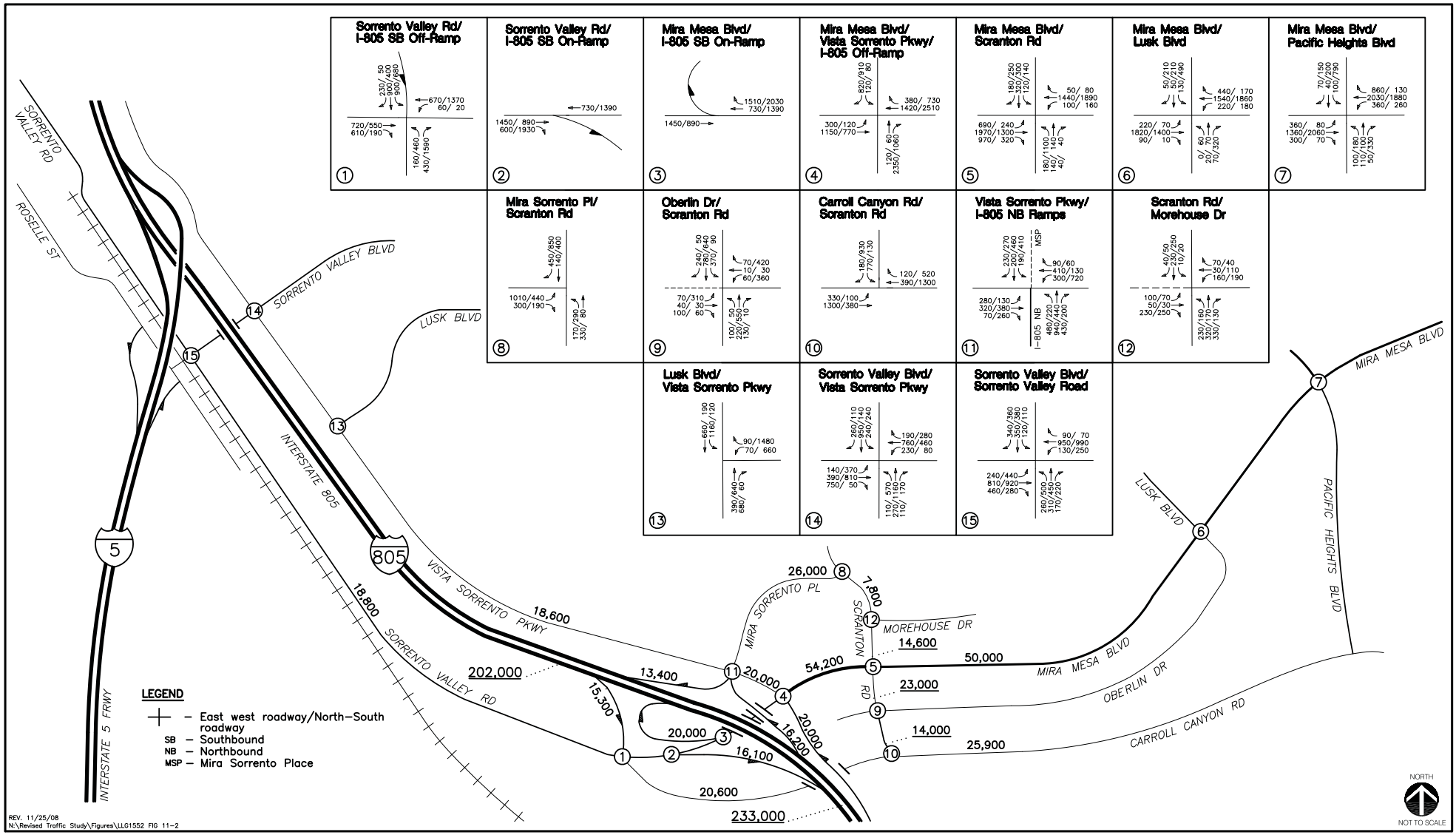

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Figure 11-2

2030 Scenario
With Carroll Canyon Rd Extension
AM/PM Peak Hours & ADTs
I-805/Mira Mesa Blvd/ Sorrento Valley Rd Interchange

11.4 Street Segments

Street segment analyses were conducted for roadways in the study area for Year 2030 with Carroll Canyon Road Extension Scenario. Table 7-4 reports street segment operations on a daily basis. As seen in *Table 7–4*, all study area street segments are calculated to operate at LOS D or better except the following:

- Carroll Canyon Road, East of Scranton Road (LOS E)

11.5 Freeway Facilities

Freeway segments were analyzed for Year 2030 with Carroll Canyon Road Extension Scenario. *Table 11–1* shows the peak hour analysis results for the freeway segments in the project area. As shown in *Table 11–1*, all freeway segments in the project area are calculated to operate at LOS D or better with the following exceptions:

- I-805 Northbound, South of Mira Mesa Blvd Interchange (LOS F(0) in AM Peak Hour when the total number of lanes is 4M+1 HOV+1A)
- I-805 Southbound, South of Mira Mesa Blvd Interchange (LOS E in PM Peak Hour when the total number of lanes is 4M+1 HOV+1A)

11.6 Merge Sections

Ramp merge sections (i.e. on-ramps) were analyzed for Year 2030 with Carroll Canyon Road Extension Scenario. *Appendix AC* contains the ramp merge calculation sheets. *Table 7–6* shows the merge analysis results for the freeway segments in the project area. As shown in *Table 7–6*, all Merge segments in the project area are calculated to operate at LOS D or better.

11.7 Diverge Sections

Ramp diverge sections (i.e. off-ramps) were analyzed for Year 2030 without Carroll Canyon Road Extension Scenario. *Appendix AD* contains the ramp diverge calculation sheets. *Table 7–7* shows the diverge analysis results for the freeway segments in the project area. As shown in *Table 7–7*, all freeway segments in the project area are calculated to operate at LOS D or better with the following exceptions:

- I-805 Northbound Off-ramp to Vista Sorrento Parkway (LOS F during AM Peak Hour)
- I-805 Northbound Off-ramp to Mira Mesa Boulevard (LOS F during AM Peak Hour)

TABLE 11–1
YEAR 2030 (WITH CARROLL CYN RD EXT) FREEWAY SEGMENT OPERATIONS

Freeway and Segment	Direction	Number of Lanes	Capacity	ADT	Peak Hour % (K)		Dir. Split % (D)		Truck Factor	Peak Hour Volume		V/C		LOS	
					AM	PM	AM	PM		AM	PM	AM	PM	AM	PM
I-805 North of Mira Mesa Blvd Interchange	NB Mainlines	4M+1 H+1A	10,400	202,000	0.0622	0.0678	0.5994	0.4451	0.921	8183	6615	0.705	0.570	C	B
		5M+2 H+1A	13,600	202,000	0.0622	0.0678	0.5994	0.4451	0.921	8183	6615	0.602	0.486	B	B
	SB Mainlines	4M+1 H+1A	10,400	202,000	0.0622	0.0678	0.4006	0.5549	0.921	5469	8247	0.471	0.711	B	C
		5M+2 H+1A	13,600	202,000	0.0622	0.0678	0.4006	0.5549	0.921	5469	8247	0.402	0.606	B	B
I-805 South of Mira Mesa Blvd Interchange	NB Mainlines	4M+1 H+1A	10,400	233,000	0.0703	0.0734	0.6826	0.3931	0.937	11933	7175	1.147	0.690	**F(0)**	C
		5M+2 H+1A	13,600	233,000	0.0703	0.0734	0.6826	0.3931	0.937	11933	7175	0.877	0.528	D	B
	SB Mainlines	4M+1 H+1A	11,600	233,000	0.0703	0.0734	0.3174	0.6069	0.937	5549	11077	0.478	0.955	B	**E**
		5M+2 H+1A	13,600	233,000	0.0703	0.0734	0.3174	0.6069	0.937	5549	11077	0.408	0.814	B	D

General Notes:

1. Capacity calculated at 2000 vph per lane and 1200 vph per aux lane (M: Mainline, A: Aux. Ex. 4M+1A=4 Mainline + 1 Aux)
2. Existing ADT Volumes from CALTRANS
3. Peak Hour Percentage (K) and Direction Split (D) for I-805 South of Mira Mesa Blvd Interchange was obtained from Caltrans "2005 Peak Hour Volume Data" Report.
4. Peak Hour Percentage (K) and Direction Split (D) for I-805 North of Mira Mesa Blvd Interchange not available from Caltrans. Therefore, they were estimated based on the 2010 traffic counts on the ramps.
5. Truck Factor was obtained from "2004 Annual Average Daily Truck Traffic on the California State Highway System", August 2005
6. Peak Hour Volume = ((ADT)(K)(D)/Truck Factor)
7. V/C = ((ADT)(K)(D)/Truck Factor/Capacity)

LOS	V/C
A	<0.41
B	0.62
C	0.8
C	0.8
D	0.92
E	1
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

11.8 Ramp Meters

Ramp meters were analyzed for Year 2030 with Carroll Canyon Road Extension Scenario. *Table 7–8* shows the peak hour analysis results for the freeway segments in the project area. As shown in *Table 7–8*, all freeway ramp meters in the project area are calculated to operate at acceptable conditions or better with the following exception:

- I-805 Northbound On-ramp from Vista Sorrento Parkway

12.0 ALTERNATIVE 1 - NEW I-805 NORTHBOUND OFF-RAMP TO CARROLL CYN RD

The "off-ramp to CCR" Alternative provides a new I-805 northbound off-ramp to Carroll Cyn Rd. *Figure 12–1* represents the approximate I-805 northbound off-ramp location along with the intersection and roadway geometry for this alternative. For comparison purposes, the "Year 2030 with Carroll Cyn Rd" scenario was considered to be the no-build scenario.

12.1 Forecasted Traffic Volumes

In order to forecast future traffic volumes, a SANDAG Model run was obtained. The proposed I-805 northbound off-ramp to Carroll Cyn Rd was coded into the model. All the traffic engineering principles and methodologies discussed in *Section 7.1* and *Section 8.1* were utilized to forecast volumes for this scenario. *Figure 12–2* illustrates forecasted Year 2030 traffic volumes for this alternative.

An analysis for this alternative was conducted and the analyses results were compared to the no-build scenario. The analyses results are shown in *Tables 12–1* thru *12–8*.

12.2 Intersections

Intersection capacity analyses were conducted for the study intersections for the "off-ramp to CCR" Alternative. *Table 12–1* summarizes the intersection analyses comparison between the "No-build" and the "off-ramp to CCR" Alternative scenarios. It should be noted that since a major change in travel pattern was anticipated in the vicinity of the new off ramp, some minor intersection restriping was considered for three intersections as indicated in *Figure 12*–1. *Appendix Z* and *Appendix 1A* contains the intersection calculation worksheets.

As seen in *Table 12–1*, most intersections under this alternative are calculated to have improved levels of service or reduced delay during AM and PM Peak hours. The following intersections are the only locations where delay would increase:

- Mira Mesa Boulevard / Lusk Blvd (during PM peak hour)
- Oberlin Drive/Scranton Road (during both AM and PM peak hour)
- Carroll Cyn Rd/ Scranton Rd (during both AM and PM peak hour)

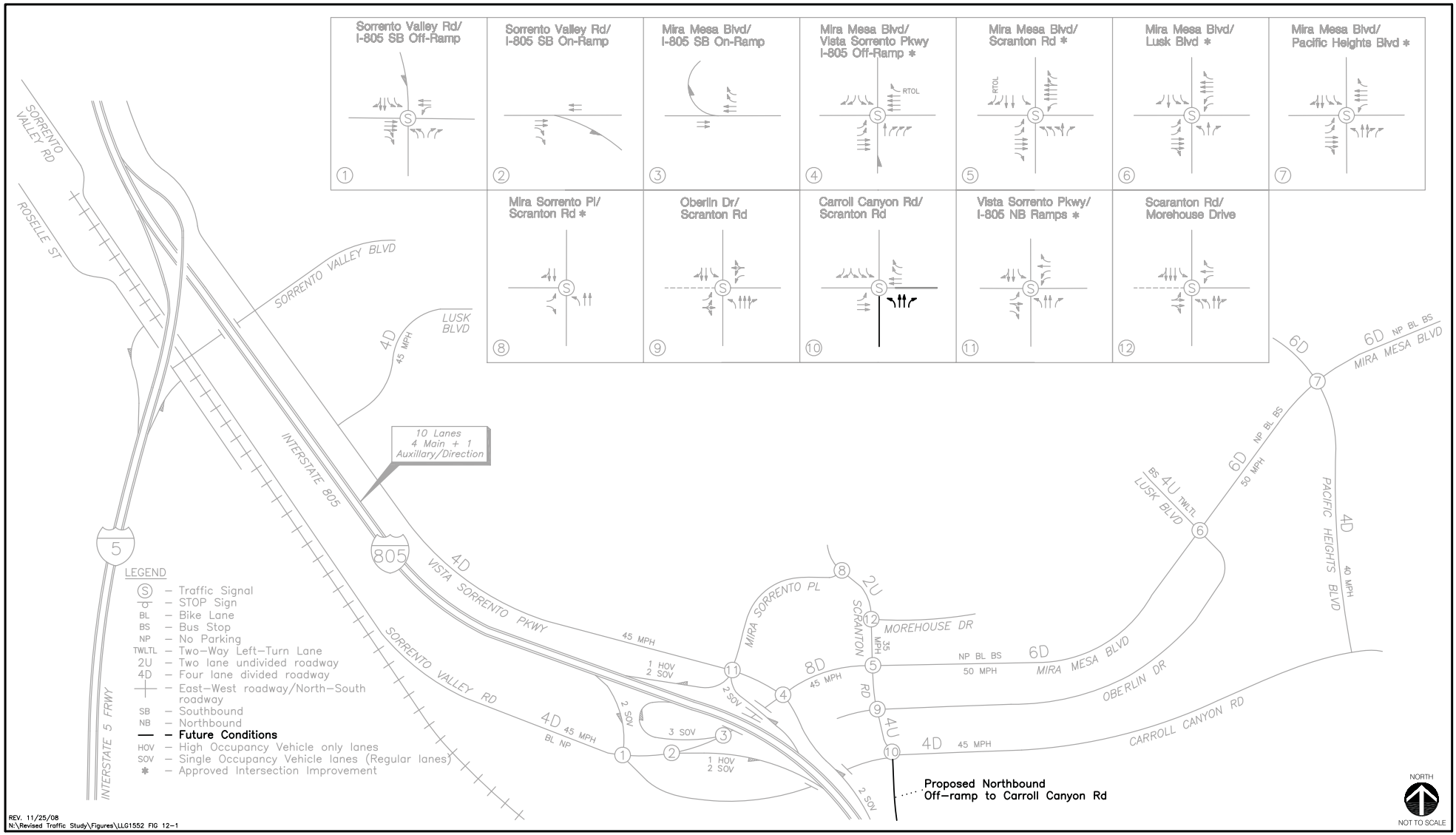

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Figure 12-1

Year 2030 Conditions Diagram
With Proposed Northbound Off-Ramp to C Rd,
& Carroll Canyon Rd Extension
I-805/Mira Mesa Blvd/
Sorrento Valley Rd Interchange

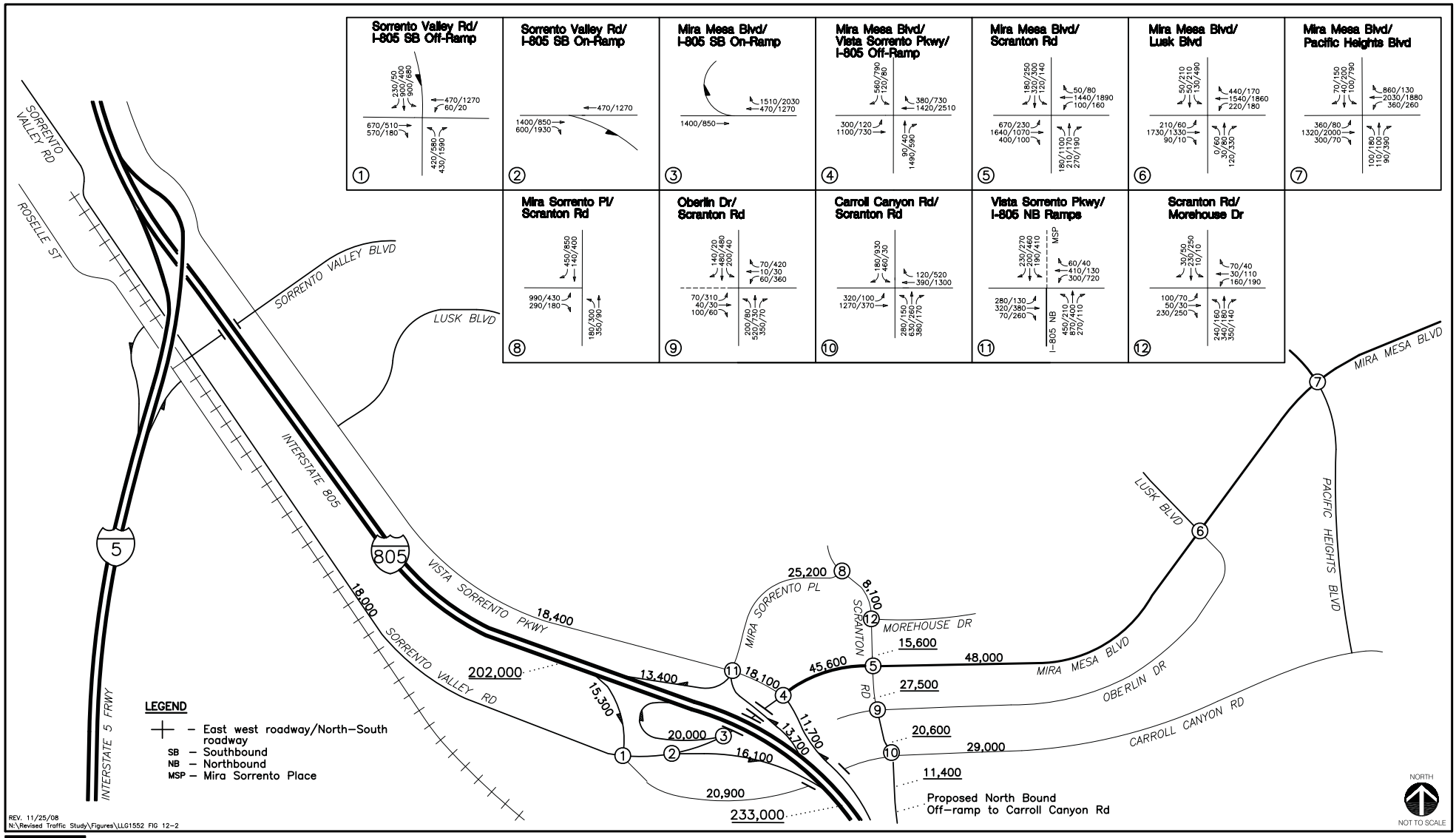

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Figure 12-2

Year 2030 Scenario
With Northbound Off-Ramp to Carroll Canyon Rd & Carroll Canyon Rd Extension
AM/PM Peak Hours & ADTs
I-805/Mira Mesa Blvd/ Sorrento Valley Rd Interchange

TABLE 12–1
YEAR 2030 SIGNALIZED INTERSECTION OPERATIONS

Intersection	Peak Hour	No-Build Delay	No-Build LOS	Off-ramp to CCR Alternative Delay	Off-ramp to CCR Alternative LOS	Change in Delay
Sorrento Valley Rd/ I-805 SB Off ramp/Carroll Canyon Rd. [e]	AM	45.0	D	32.6	C	-12.4
	PM	**>100**	**F**	**>100**	**F**	**->30**
Mira Mesa Blvd/ Vista Sorrento Pkwy/ I-805 NB Off ramp [f]	AM	**>100**	**F**	40.5	D	**->30**
	PM	27.4	C	31.0	C	3.6
Mira Mesa Blvd/ Scranton Rd [f]	AM	**>100**	**F**	54.7 [i]	D	->30
	PM	**87.4**	**F**	**75.5** [i]	**E**	**-11.9**
Mira Mesa Blvd/ Lusk Blvd [f]	AM	22.7	C	22.0	C	-0.7
	PM	29.3	C	35.1	D	5.7
Mira Mesa Blvd/ Pacific Heights Blvd [f]	AM	**57.7**	**E**	**56.1**	E	-1.6
	PM	**>100**	**F**	**>100**	**F**	**->30**
Mira Sorrento Pl/Scranton Rd [g]	AM	**>100**	**F**	**83.0** [i]	**F**	**->30**
	PM	**>100**	**F**	47.7 [i]	D	**->30**
Oberlin Dr/ Scranton Rd	AM	41.3	D	51.9 [i]	D	10.6
	PM	**64.2**	**E**	**69.9** [i]	**E**	5.7
Carroll Canyon Rd/ Scranton Rd [e]	AM	17.8	B	36.4	D	18.6
	PM	19.1	B	39.7	C	20.6
Vista Sorrento Pkwy/I-805 NB Ramps [h]	AM	**68.6**	**E**	**58.8**	**E**	-9.8
	PM	**60.3**	**E**	**61.1**	**E**	0.8
Morehouse Dr/ Scranton Rd	AM	30.6	C	29.1	C	-1.5
	PM	38.4	D	35.9	D	-2.5

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. CCR: Carroll Canyon Road Extension
d. DNE: Does Not Exist, no conflicting movements.
e. Intersection Lane Configuration was obtained from the "*Carroll Canyon Road Extension Traffic Impact Analysis*" Report dated April 2005.
f. Intersection Lane Configuration was obtained from the "*Qualcomm Building W Traffic Study*" Report dated April 1, 2004. The improvements suggested in the Traffic Study are under design stage.
g. Intersection Lane Configuration obtained from the "*Mira Sorrento Place Extension Traffic Impact Analysis*" Report dated February 27, 2003.
h. Intersection Lane Configuration for future scenarios was obtained from the "*I-805 Northbound Hook Ramp to Vista Sorrento Pkwy*" Memorandum dated November 27, 2005, submitted by LLG.
i. Minor restriping was considered in alternative scenario analysis.

SIGNALIZED

DELAY/LOS THRESHOLDS

Delay	LOS
0.0 < 10.0	A
10.1 to 20.0	B
20.1 to 35.0	C
35.1 to 55.0	D
55.1 to 80.0	E
> 80.1	F

Table 12–2 summarizes the queuing comparison information on all I-805 / Mira Mesa Boulevard / Sorrento Valley Road interchange off-ramps. Appendix AA and Appendix 1B contains the queuing calculation worksheets.

12.3 Intersection Lane Vehicle (ILV) Analysis

Table 12–3 summarizes the ILV analysis results for the signalized intersections on I-805/ Mira Mesa Boulevard / Sorrento Valley Road interchange off-ramps. As seen in *Table 12–3*, all intersections are calculated to operate "Over Capacity" during both AM and PM peak hours. However with the "off-ramp to CCR" alternative, all intersections analyzed had reduced ILV number. Appendix AB and Appendix 1C contains the ILV analysis worksheets.

12.4 Street Segments

Street segment analyses were conducted for roadways in the study area for the "off-ramp to CCR" Alternative. *Table 12–4* reports street segment operations on a daily basis. As seen in *Table 12–4*, all study area street segments are calculated to operate at LOS D or better except the following:

- Carroll Canyon Road, East and West of Scranton Road (LOS E)

TABLE 12–2
OFF-RAMP QUEUE LENGTHS

Off Ramp Location	Scenario	Off ramp 95 Percentile Queue Length (ft)					
		AM			PM		
		Left	Through	Right	Left	Through	Right
I-805 NB Off-Ramp to Vista Sorrento Pkwy	No Build	560	480	110	320	280	50
	Off-ramp to CCR	570	470	50	260	190	20
I-805 NB Off-Ramp to Mira Mesa Blvd	No Build	—	120	1480	—	100	220
	off-ramp to CCR	—	70	330	—	50	40
I-805 SB Off ramp to Sorrento Valley Rd	No Build	290	450		540	310	
	off-ramp to CCR	190	450		230	350	
I-805 NB Off ramp to Carroll Cyn Rd	No Build	—	—	—	—	—	—
	off-ramp to CCR	280	290	100	150	110	60

General Notes:

1. Source: Synchro Analysis.
2. Queue lengths rounded to nearest 10 feet.

TABLE 12–3
CALTRANS ILV METHOD INTERSECTION OPERATIONS

Intersection	Scenario	AM		PM	
		ILV[1]	Capacity[2]	ILV	Capacity
I-805 SB Off-Ramp / Sorrento Valley Rd	No Build	***1890***	***Over***	***2070***	***Over***
	off-ramp to CCR	***1854***	***Over***	***2020***	***Over***
I-805 NB Off-Ramp / Mira Mesa Blvd / Vista Sorrento Pkwy	No Build	***1958***	***Over***	***1796***	***Over***
	off-ramp to CCR	***1524***	***Over***	***1616***	***Over***
I-805 NB Ramps / Vista Sorrento Pkwy	No Build	***1730***	***Over***	***1650***	***Over***
	off-ramp to CCR	***1635***	***Over***	***1650***	***Over***

Footnotes:

1. ILV = Intersecting Lane Vehicles.
2. CAPACITY is shown as *UNDER* capacity, *AT* capacity or *OVER* capacity;

Under *Capacity = <1200 ILV/Hour*

At Capacity = >1200 but < 1500 ILV/Hour

Over *Capacity = >1500 ILV/Hour*

TABLE 12–4
STREET SEGMENT OPERATIONS

Segment	Capacity at LOS E	Scenarios				Change in Volume
		No Build		Off-ramp to CCR Alternative		
		Volume	LOS[b]	Volume	LOS[2]	
Mira Mesa Blvd						
I-805 SB Off ramp to Vista Sorrento Pkwy	70,000	52,000	C	50,900	C	-1,100
Vista Sorrento Pkwy to Scranton Road	70,000	54,200	C	45,600	C	-8,600
Scranton Road to Lusk Blvd	60,000	50,000	C	48,000	C	-2,000
Sorrento Valley Road						
North of I-805 SB Off ramp	40,000	18,800	B	18,000	B	-800
I-805 SB Off ramp to I-805 SB on-ramp	40,000	24,000	C	22,900	C	-1,100
Vista Sorrento Pkwy						
Lusk Blvd to I-805 NB ramps[d]	30,000	18,600	C	18,400	C	-200
I-805 NB ramps to Mira Mesa Blvd	30,000	20,000	C	18,100	C	-1,900
Scranton Road						
Mira Sorrento Place to Morehouse Drive	15,000	7,800	C	8,100	C	300
Morehouse Drive to Mira Mesa Blvd	50,000	14,600	A	15,600	A	1,000
Mira Mesa Blvd to Oberlin Dr	50,000	23,000	B	27,500	B	4,500
Oberlin Dr to Carroll Canyon Rd	40,000	14,000	A	20,600	B	6,600
Carroll Canyon Road						
East of Scranton Road[d]	30,000	**25,900**	**E**	**29,000**	**E**	**3,100**
West of Scranton Road[d]	30,000	20,600	D	**20,900**	**E**	**300**

Footnotes:
a. ADT – Average Daily Traffic.
b. LOS – Level of Service.
c. CCR – Carroll Canyon Road Extension
d. *Assumed to be 4-lane collector in year 2030*

General Notes:
1. Delay and LOS worse than LOS D shown in **bold**.

12.5 Freeway Facilities

Freeway segments were analyzed for the "off-ramp to CCR" Alternative. *Table 12–5* shows the peak hour analysis results for the freeway segments in the project area. As shown in *Table 12-5*, all freeway segments in the project area are calculated to operate at LOS D or better with the following exceptions:

- I-805 Northbound, South of Mira Mesa Blvd Interchange (LOS F(0) in AM Peak Hour)
- I-805 Southbound, South of Mira Mesa Blvd Interchange (LOS E in PM Peak Hour)

12.6 Merge Sections

Ramp merge sections (i.e. on-ramps) were analyzed for the "off-ramp to CCR" Alternative. Appendix AC and Appendix 1D contains the ramp merge calculation sheets. *Table 12–6* shows the merge analysis results for the freeway segments in the project area. As shown in *Table 12–6*, all Merge segments in the project area are calculated to operate at LOS D or better.

12.7 Diverge Sections

Ramp diverge sections (i.e. off-ramps) were analyzed for the "off-ramp to CCR" Alternative. *Appendix AD* and *Appendix 1E* contains the ramp diverge calculation sheets. *Table 12–7* shows diverge analysis results for the freeway segments in the project area. As shown in *Table 12–7*, all freeway segments in the project area are calculated to operate at LOS D or better with the following exception:

- I-805 Northbound Off-ramp to Vista Sorrento Parkway (LOS F during AM Peak Hour)

TABLE 12–5
YEAR 2030 (OFF-RAMP TO CCR ALTERNATIVE) FREEWAY SEGMENT OPERATIONS

Freeway and Segment	Direction	Scenario (Number of Lanes)	Capacity	ADT	Peak Hour Volume		V/C		LOS	
					AM	PM	AM	PM	AM	PM
I-805 North of Mira Mesa Blvd Interchange	NB Mainlines	No-build (4M+1H+1A)	10,400	202,000	8183	6615	0.787	0.636	C	C
		off-ramp to CCR (4M+1H+1A)	10,400	202,000	8183	6615	0.787	0.636	C	C
	SB Mainlines	No-build (4M+1H+1A)	10,400	202,000	5469	8247	0.526	0.793	B	C
		off-ramp to CCR (4M+1H+1A)	10,400	202,000	5469	8247	0.526	0.793	B	C
I-805 South of Mira Mesa Blvd Interchange	NB Mainlines	No-build (4M+1H+1A)	10,400	233,000	11933	7175	1.147	0.690	**F(0)**	C
		off-ramp to CCR (4M+1H+1A)	10,400	233,000	11933	7175	1.147	0.690	**F(0)**	C
	SB Mainlines	No-build (4M+1H+2A)	11,600	233,000	5549	11077	0.478	0.955	B	**E**
		off-ramp to CCR (4M+1H+2A)	11,600	233,000	5549	11077	0.478	0.955	B	**E**

General Notes:

1. Capacity calculated at 2000 vph per lane and 1200 vph per aux lane (M: Mainline, A: Aux. Ex. 4M+1A=4 Mainline + 1 Aux)
2. Existing ADT Volumes from CALTRANS
3. Peak Hour Percentage (K) and Direction Split (D) for I-805 South of Mira Mesa Blvd Interchange was obtained from Caltrans "2005 Peak Hour Volume Data" Report.
4. Peak Hour Percentage (K) and Direction Split (D) for I-805 North of Mira Mesa Blvd Interchange not available from Caltrans. Therefore, they were estimated based on the 2010 traffic counts on the ramps.
5. Truck Factor was obtained from "2004 Annual Average Daily Truck Traffic on the California State Highway System", August 2005
6. Peak Hour Volume = ((ADT)(K)(D)/Truck Factor)
7. V/C = ((ADT)(K)(D)/Truck Factor/Capacity)

LOS	V/C
A	<0.41
B	0.62
C	0.8
C	0.8
D	0.92
E	1
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

TABLE 12–6
RAMP MERGE OPERATIONS

Ramp Merge Location	Scenario	Mainline Facility Before Merge (Rightmost 2 Lanes Only)					Mainline Facility at On-Ramp Merge (Rightmost 2 Lanes Only)					Mainline Facility After Merge (All Mainline Lanes)					Ramp Junction LOS[3]	
		Volume [1]		Capacity [2]	LOS F?		Volume		Capacity	LOS F?		Volume		Capacity	LOS F?			
		AM	PM		AM	PM	AM	PM		AM	PM	AM	PM		AM	PM	AM	PM
I-805 NB On-Ramp from Vista Sorrento Pkwy	No Build	1320	952	4700	N	N	1980	2619	4600	N	N	6974	6221	10400	N	N	A	B
	off-ramp to CCR	1286	965	4700	N	N	1946	2632	4600	N	N	6812	6283	10400	N	N	A	B
I-805 SB Loop ramp from Mira Mesa Blvd	No Build	704	1345	4700	N	N	2600	3894	4600	N	N	5265	8985	10400	N	N	B	**C**
	off-ramp to CCR	704	1345	4700	N	N	2600	3894	4600	N	N	5265	8985	10400	N	N	B	**C**
I-805 SB On ramp from Sorrento Valley Rd	No Build	1264	790	4700	N	N	1959	3025	4600	N	N	5050	10325	11600	N	N	B	C
	off-ramp to CCR	1264	790	4700	N	N	1959	3025	4600	N	N	5050	10325	11600	N	N	B	C

Footnotes:

1. Volumes factored up to account for peak hour factor (PHF) and truck percentages and are expressed in vehicles per hour (vph).
2. Capacity based on methodology found in Chapter 25 of the *2000 Highway Capacity Manual (HCM)*. For mainlines, capacity for the mainline section is referred and for ramps, capacity is referred as Ramp junction capacity at the merge influence area.
3. Ramp operations dependent on freeway mainline operations and ramp capacity.

TABLE 12–7
RAMP DIVERGE OPERATIONS

Ramp Diverge Location	Scenario	Mainline Facility Before Diverge (Rightmost 2 Lanes Only)					Mainline Facility at Off-Ramp Diverge (Off-ramp pc/h volume)					Mainline Facility After Diverge (All Mainline Lanes)					Ramp Junction LOS[3]	
		Volume [1]		Capacity [2]	LOS F?		Volume		Capacity	LOS F?		Volume		Capacity	LOS F?			
		AM	PM		AM	PM	AM	PM		AM	PM	AM	PM		AM	PM	AM	PM
I-805 NB Off-Ramp to Vista Sorrento Pkwy	No Build	**5030**	3151	4400	**Y**	N	**2142**	996	2000	**Y**	N	6623	4943	10400	N	N	**F**	C
	off-ramp to CCR	**4699**	3030	4400	**Y**	N	1841	834	2000	N	N	6554	5037	10400	N	N	**F**	C
I-805 SB Off-Ramp to Mira Mesa Blvd	No Build	**5709**	3137	4400	**Y**	N	2860	1320	3800	N	N	**10956**	6987	10,400	**Y**	N	**F**	B
	off-ramp to CCR	4227	2225	4400	N	N	1829	672	3800	N	N	**11,053**	5974	10,400	Y	N	**F**	A
I-805 SB Off-Ramp to Sorrento Valley Rd	No Build	3139	2954	4400	N	N	2350	1308	3800	N	N	3033	6331	10400	N	N	B[4]	B
	off-ramp to CCR	3139	2954	4400	N	N	2350	1308	3800	N	N	3033	6331	10400	N	N	B[4]	B
I-805 NB Off-Ramp to Carroll Canyon Rd	No Build	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	off-ramp to CCR	3979	2225	4400	N	N	1494	672	3800	N	N	9559	5974	11600	N	N	B	A

Footnotes:

1. Volumes factored up to account for peak hour factor (PHF) and truck percentages and are expressed in vehicles per hour (vph).
2. Capacity based on methodology found in Chapter 25 of the *2000 Highway Capacity Manual (HCM)*. For mainlines, capacity for the mainline section is referred and for ramps, capacity is referred as Ramp junction capacity at the merge influence area.
3. Ramp operations dependent on freeway mainline operations and ramp capacity.
4. Impacts caused by the SB off Ramp/Sorrento Valley Rd intersection queues were not accounted in the diverge analysis.

12.8 Ramp Meters

Ramp meters were analyzed for "off-ramp to CCR" Scenario. *Table 12–8* shows the peak hour analysis results for the freeway segments in the project area. As shown in *Table 12–8*, all freeway ramp meters in the project area are calculated to operate at acceptable conditions or better with the following exceptions:

- I-805 Southbound On-ramp from Mira Mesa Boulevard
- I-805 Northbound On-ramp from Vista Sorrento Parkway

TABLE 12–8
RAMP METER OPERATIONS (FIXED RATE METHOD)

Location/Condition	Minimum/ Maximum Rate	Peak Hour Demand [b]	Peak Hour Demand/Lane [c]	Meter Flow Rate/Lane[a]	Excess Demand	Delay (min)	Queue (ft)
I-805 Southbound On-ramp from Sorrento Valley Rd (3:00 PM - 7:00 PM)							
No Build	Min	1930	965	509	456	54	11400
	Max	1930	965	996	0	0	0
off-ramp to CCR	Min	1930	965	509	456	54	11400
	Max	1930	965	996	0	0	0
I-805 Southbound On-ramp from Mira Mesa Blvd (3:00 PM - 6:30 PM)							
No Build	Min	2030	812	828	0	0	0
	Max	2030	812	996	0	0	0
off-ramp to CCR	Min	2030	812	828	0	0	0
	Max	2030	812	996	0	0	0
I-805 Northbound On-ramp from Vista Sorrento Parkway (3:00 PM - 7:00 PM)							
No Build	Min	1440	749	197	552	168	13795
	Max	1440	749	348	401	69	10020
off-ramp to CCR	Min	1440	749	197	552	168	13795
	Max	1440	749	348	401	69	10020

Footnotes:

a. Meter Rates obtained from CALTRANS (Appendix B).
b. Peak Hour Volumes obtained from the existing ramp rata.
c. Lane Utilization Factor obtained from available ramp data.
d. Assumed to have 3-lanes (2 SOV + 1 HOV) and a lane utilization factor of 50% was utilized.
e. Ramp meters were assumed to be operating at unacceptable conditions, if the traffic peak hour demand/lane/hour is greater than the maximum meter rate.

12.9 Freeway Weaving Operations

Table 12-9 reports the results for freeway weaving under the "off-ramp to CCR" Scenario. The weave segment analysis was conducted using both HCM and HDM methodology. As indicated in Table 12-9, I-805 northbound weave segment (between La Jolla Village Drive On-ramp to Proposed Carroll Cyn Rd Off Ramp) operates at unacceptable levels of service in both AM and PM peak hour. *Appendix 1F* contains the freeway weaving analyses worksheets.

TABLE 12-9
"OFF-RAMP TO CCR" SCENARIO FREEWAY WEAVE OPERATIONS

Segment	Peak Hour	HCM Methodology			HDM Methodology
		Speed[a]	Density[b]	LOS[c]	LOS
NB I-805 (La Jolla Village Drive On-ramp to Proposed Carroll Cyn Rd Off Ramp)	AM	27.7	43.78	**F**	**F**
	PM	24.7	39.4	**E**	**F**

Footnotes:

a. Speed is measured in miles per hour (MPH);

b. Density is measured in Passenger Cars/Mile/Lane (pc/mi/ln);

c. Level of Service

12.10 Results—NB Off-Ramp to CCR Alternative

Tables 12–1 through *12–8* show that several locations would operate at better levels of service with this alternative. Particularly, this alternative would improve the Mira Mesa Blvd/I-805 NB off-ramp and Mira Mesa Blvd/Scranton Road intersections. These tables also show that a few locations would experience increased delay, especially on Carroll Cyn Rd and Scranton Rd. In addition, as indicated in *Table 12–9* the proposed NB off-ramp to Carroll Cyn Rd would have a negative significant impact on the freeway weaving area.

13.0 ALTERNATIVE 2—LOCAL ROADWAY IMPROVEMENTS

The "Local Improvements" Alternative provides individual improvements that can relieve some of the congestion at the local intersections. Since individual intersection improvements were identified, only intersection analysis was conducted for this scenario. *Figure 13–1* represents intersection and roadway geometry for this alternative with the objective of achieving LOS D or better operations. Even though some of the intersection improvements depicted in *Figure 13–1* may not be feasible due to either right of way constraints or some other engineering limitations, this alternative would indicate the roadway improvements needed to achieve acceptable levels of service for the intersections within the study area.

13.1 Intersections

Intersection capacity analyses were conducted for the study intersections, which operate at LOS E or LOS F in the Year 2030 with Carroll Canyon Road scenario. *Table 13–1* summarizes the intersection analyses comparison between the "No-build" and the "Local Improvements" Alternative scenario. As seen in *Table 13–1* all study intersections operate at acceptable levels of service with the "Local Improvements" alternative. *Appendix Z* and *Appendix 2A* contains the intersection calculation worksheets.

Table 13–2 summarizes the queuing comparison information on all I-805 / Mira Mesa Boulevard / Sorrento Valley Road interchange off-ramps. Appendix AA and Appendix 2B contains the queuing calculation worksheets.

13.2 Intersection Lane Vehicle (ILV) Analysis

Table 13–3 summarizes the ILV analysis results for the signalized intersections on I-805/ Mira Mesa Boulevard / Sorrento Valley Road interchange off-ramps. As seen in *Table 13–3*, most of the intersections are calculated to operate "Over Capacity" during both AM and PM peak hours. However with the "Local Improvements" alternative, all intersections analyzed had a reduced ILV number. Appendix AB and Appendix 2C contains the ILV analysis worksheets.

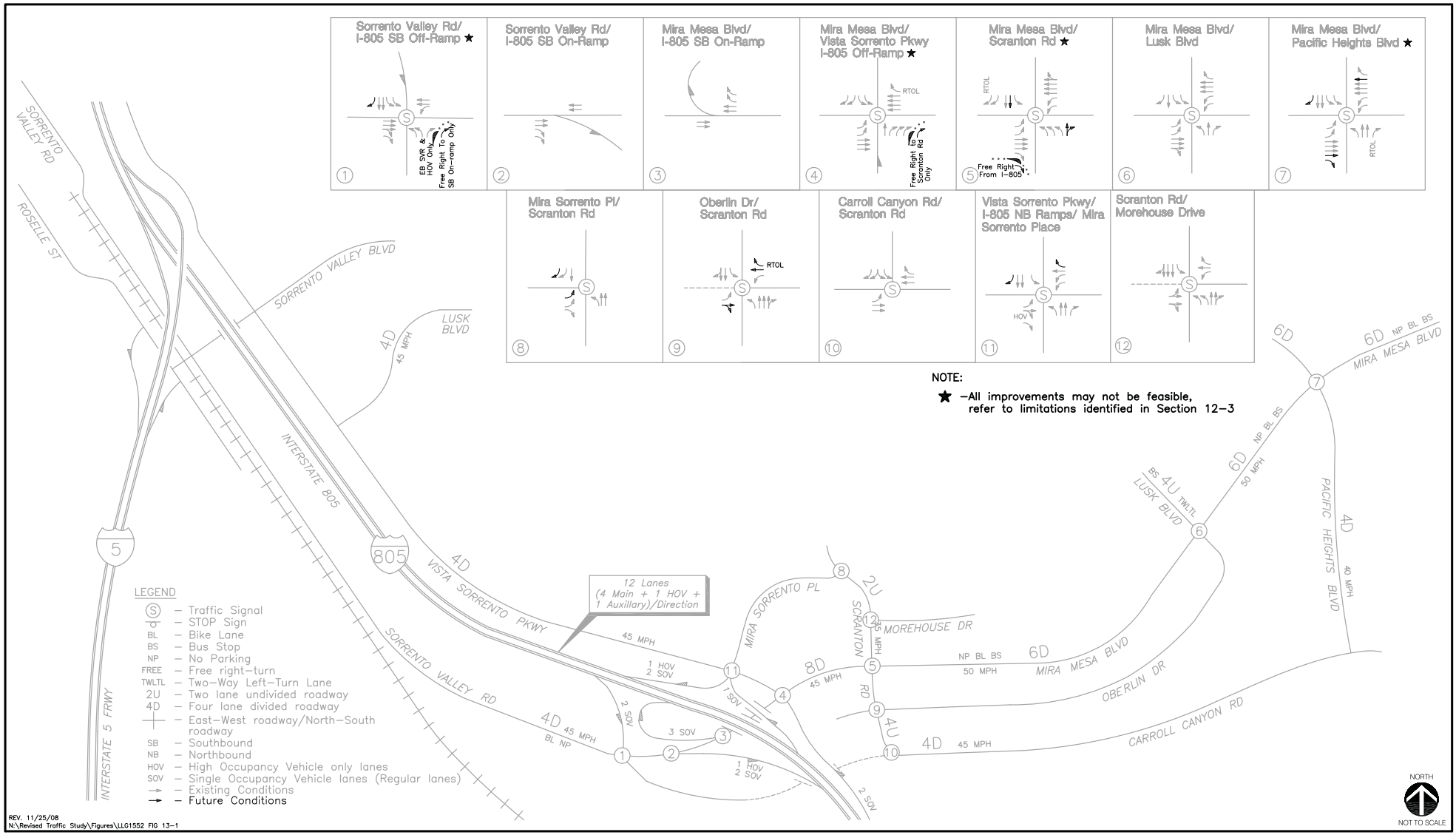

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Figure 13-1

Recommended Roadway & Intersection Geometry
2030 With Carroll Canyon Rd Extension

I-805/Mira Mesa Blvd/
Sorrento Valley Rd Interchange

TABLE 13–1
YEAR 2030 SIGNALIZED INTERSECTION OPERATIONS

Intersection	Peak Hour	No-Build Delay	No-Build LOS	Local Improvements Alternative Delay	Local Improvements Alternative LOS	Change in Delay
Sorrento Valley Rd/ I-805 SB Off ramp/Carroll Canyon Rd.	AM	45.0 [e]	D	26.4	C	-18.6
	PM	**>100** [e]	**F**	49.7	D	->30
Mira Mesa Blvd/ Vista Sorrento Pkwy/ I-805 NB Off ramp	AM	**>100** [f]	**F**	51.6	D	->30
	PM	27.4 [f]	C	33.5	C	6.1
Mira Mesa Blvd/ Scranton Rd	AM	**>100** [f]	**F**	54.9	D	->30
	PM	**87.4** [f]	**F**	51.0	D	->30
Mira Mesa Blvd/ Pacific Heights Blvd	AM	**57.7** [f]	**E**	30.1	C	-27.6
	PM	**>100** [f]	**F**	54.8	D	->30
Mira Sorrento Pl/Scranton Rd	AM	**>100** [g]	**F**	22.4	C	->30
	PM	**>100** [g]	**F**	21.3	C	->30
Oberlin Dr/ Scranton Rd	AM	41.3	D	33.6	C	-7.7
	PM	**64.2**	**E**	50.7	D	-13.5
Vista Sorrento Pkwy/I-805 NB Ramps	AM	**68.6** [h]	**E**	54.9	D	-13.7
	PM	**60.3** [h]	**E**	54.0	D	-6.3

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. CCR: Carroll Canyon Road Extension
d. DNE: Does Not Exist, no conflicting movements.
e. Intersection Lane Configuration for future scenarios was obtained from the "*Carroll Canyon Road Extension Traffic Impact Analysis*" Report dated April 2005.
f. Intersection Lane Configuration was obtained from the "*Qualcomm Building W Traffic Study*" Report dated April 1, 2004. The improvements suggested in the Traffic Study are under design stage.
g. Intersection Lane Configuration was obtained from the "*Mira Sorrento Place Extension Traffic Impact Analysis*" Report dated February 27, 2003.
h. Intersection Lane Configuration was obtained from the "*I-805 Northbound Hook Ramp to Vista Sorrento Pkwy*" Memorandum dated November 27, 2005, submitted by LLG.

SIGNALIZED

DELAY/LOS THRESHOLDS

Delay	LOS
0.0 < 10.0	A
10.1 to 20.0	B
20.1 to 35.0	C
35.1 to 55.0	D
55.1 to 80.0	E
> 80.1	F

TABLE 13–2
OFF - RAMP QUEUE LENGTHS

Off Ramp Location	Model Run: Scenario	Off ramp 95 Percentile Queue Length (ft)					
		AM			PM		
		Left	Through	Right	Left	Through	Right
I-805 NB Off-Ramp to Vista Sorrento Pkwy	No Build	560	480	110	320	280	50
	Local Improvements	590	490	130	290	280	30
I-805 NB Off-Ramp to Mira Mesa Blvd	No Build	—	120	1480	—	100	220
	Local Improvements	—	90	520	—	80	130
I-805 SB Off ramp to Sorrento Valley Rd	No Build	290	450		540	310	
	Local Improvements	290	310	110	360	190	30

General Notes:

1. Source: Synchro Analysis.
2. Queue lengths rounded to nearest 10 feet.

TABLE 13–3
CALTRANS ILV METHOD INTERSECTION OPERATIONS

Intersection	Scenario	AM		PM	
		ILV[1]	Capacity[2]	ILV	Capacity
I-805 SB Off-Ramp / Sorrento Valley Rd	No Build	*1890*	*Over*	*2070*	*Over*
	Local Improvements	*1515*	*Over*	*1315*	*at*
I-805 NB Off-Ramp / Mira Mesa Blvd / Vista Sorrento Pkwy	No Build	*1958*	*Over*	*1796*	*Over*
	Local Improvements	*1764*	*Over*	*1732*	*Over*
I-805 NB Ramps / Vista Sorrento Pkwy	No Build	*1730*	*Over*	*1650*	*Over*
	Local Improvements	*1640*	*Over*	*1420*	*at*

Footnotes:

1. ILV = Intersecting Lane Vehicles.
2. CAPACITY is shown as *UNDER* capacity, *AT* capacity or *OVER* capacity;

Under *Capacity = <1200 ILV/Hour*

At Capacity = >1200 but < 1500 ILV/Hour

Over *Capacity = >1500 ILV/Hour*

13.3 Local Improvements Alternative Summary

Even though this alternative would only improve the intersections within the study area and not the I-805/Mira Mesa Blvd/Sorrento Valley Rd interchange, these improvements would have a positive impact to the overall study area. Therefore based on the results shown in Tables 13-1 to 13-3, all the study intersections would operate at LOS D or better with the improvements depicted in ***Figure 13-1***. As discussed earlier, some of the intersection improvements depicted in Figure 13-1 may not be feasible due to either right of way constraints or other engineering limitations. ***Further engineering study for individual intersections is warranted to determine the feasibility of the suggested improvements.*** Following are some of the limitations identified with the improvements depicted in Figure 13-1.

Free Right Turns (Sorrento Valley Road/I-805 SB Off-Ramp, Mira Mesa Blvd/Vista Sorrento Pkwy and Mira Mesa Blvd/Scranton Blvd Intersections): Although free right turns provide very high traffic capacity, they generally speed up traffic and can create discomfort to pedestrians and bicyclists. Therefore, the City of San Diego and Caltrans typically do not recommend free right turns as an improvement option. Also the Caltrans Highway Design Manual (Index 504.3 (2)) states that "*if a separate right-turn lane is provided at ramp terminals, the turn lane should not continue as a free right unless pedestrian volumes are low, the right-turn lane continues as a separate full width lane for at least 60 m prior to merging, and access control is maintained for at least 60 m past the ramp intersection. Provision of the free right should also be precluded if left-turn movements of any kind are allowed within 125 m of the ramp intersection"*. Additional analysis is required to determine the above requirement. There may also be an issue regarding the "priority" provided to vehicles in certain movements due to free right for the vehicles getting priority to the on - ramp.

Exceeding Community Plan Standards (Mira Mesa Blvd/Pacific Heights Blvd Intersection): Based on the Mira Mesa Community Plan, Mira Mesa Blvd is designated as a 6-lane Prime Arterial. Therefore, an additional through lane in each direction would exceed the community plan standards.

14.0 ALTERNATE 3—COASTER STATION/ BRTC/ CARROLL CYN RD DAR

The "Coaster/BRTC/DAR" Alternative provides a Direct Access Ramp (DAR) at I-805 to and from Carroll Canyon Road, a new Bus Rapid Transit Center (BRTC) and also includes the relocation of the existing Coaster station from Sorrento Valley Road to a new location on Carroll Canyon Road. *Figure 14–1* represents the approximate Coaster Station and BRTC locations (along with the baseline intersection and roadway geometry for this alternative). For comparison purposes the "Year 2030 with Carroll Cyn Rd" scenario was considered as the no-build scenario.

14.1 Forecasted Traffic Volumes

In order to forecast future traffic volumes, a SANDAG Model run was obtained. The proposed Coaster Station and BRTC land uses were incorporated into the appropriate Traffic Analysis Zones (TAZ) and the proposed DAR was also coded into the model. All the traffic engineering principles and methodologies discussed in *Section 7.1* and *Section 8.1* were utilized to forecast volumes for this scenario.

14.1.1 *Intermodal Assumptions*

Trip making characteristics for this alternative are driven not only by local and regional traffic, but also by future Coaster commuter rail operations, future proposed BRT services and intermodal connectivity between the BTTC/Coaster Station and the local community.

The existing Coaster commuter rail service is comprised of eleven weekday runs serving eight stations including Sorrento Valley. Headways during the AM Peak (southbound) and PM Peak (northbound) are currently 30 minutes. Future double tracking of "The Los Angeles-San Diego Corridor Agency (LOSSAN)" rail corridor will increase headways to 20 minutes in year 2030. Coaster trains are assumed to operate five-car trainsets, with 140 seated passengers per train car.

Given its proximity to regional employment centers, the Sorrento Valley Coaster Station is mainly a peak-hour, commuter-oriented station. Over 2,000 Coaster passengers board or alight Coaster trains in Sorrento Valley. The majority of the ridership arrives in Sorrento Valley in the morning and departs in the evening. Passenger information is shown below.

Summary Counts, FY 2005
Sorrento Valley Coaster Station

Direction	Daily On	Daily Off	AM On	AM Off	PM On	PM Off
Northbound	870	165	16	67	769	57
Southbound	144	881	49	767	71	24

Source: SANDAG

Passenger Counts, March 2005
Sorrento Valley Coaster Station

Direction	Time	On	Off
Northbound	3:40 PM	210	9
Northbound	4:22 PM	223	13
Northbound	4:52 PM	176	21
Northbound	5:22 PM	160	14
Northbound	6:05 PM	53	9
Southbound	5:23 AM	8	74
Southbound	6:06 AM	11	216
Southbound	6:44 AM	9	177
Southbound	7:15 AM	17	212
Southbound	7:40 AM	12	162

Source: SANDAG

The size and location of the existing Sorrento Valley Coaster Station governs local circulation and station connectivity. Lack of available land has constrained the parking capacity at this station. As an origin station, most passengers rideshare or are dropped off during the AM Peak. A considerable portion of the morning patronage also walks or bicycles to the station, as shown below.

AM Peak Mode Split
Boarding Passengers @ Sorrento Valley Coaster Station

Drive/Drove Alone	21%
Carpool	18%
Drop Off/Pick Up/Taxi	48%
Transit/Shuttle	9%
Walk/Bicycle	4%
All Trips	100%

Source: SANDAG

For train passengers arriving at the Sorrento Valley Station (mainly during the AM peak), more than half transfer to the Sorrento Valley Coaster Connection (SVCC) shuttles that serve the employment sites. A considerable portion also use private employer-based shuttles or local buses to reach their final destination.

2003 Mode Split
Alighting Passengers @ Sorrento Valley Coaster Station

Drive/Drove Alone	22	3%
Carpool	27	4%
Drop Off/Pick Up/Taxi	48	7%
Coaster Connection	348	51%
Company Shuttle	58	9%
Transfer To Another Bus	51	7%
Walk	104	15%
Bicycle	24	4%
All Trips	682	100%

Source: SANDAG

The existing SVCC service is comprised of eight routes serving Sorrento Mesa, Carroll Canyon, Torrey Pines and University areas. Weekday SVCC service runs from 6:00 to 8:30 am and from 3:30 to 6:30 pm. SVCC runs (and corresponding service area) are constrained to 15 minutes in order to return to Coaster station for the next train.

There are eight (8) Coaster Connection routes that provide scheduled service from the Sorrento Valley Station.

Route	Route Description	Monthly Ridership	Daily Average	Service Split
Route 971	Sorrento Mesa via Pacific Center	1,894	86.09	
Route 972	Sorrento Mesa via Lusk/Morehouse/Scranton	3,895	177.05	
Route 973	Carroll Canyon via South Pacific Heights/Oberlin	2,032	92.36	
Route 974	Carroll Canyon via Nancy Ridge	1,603	72.86	
	Sorrento Valley/Mesa Subtotal	9,424	428.36	59%
Route 975	Carroll Mesa	1,309	59.50	
Route 976	Campus Point	2,017	96.23	
Route 977	Torrey Pines South	1,385	62.95	
Route 978	Torrey Pines North	1,725	78.41	
	University Subtotal	6,436	297.09	41%
	SVCC Total	15,860	725	100%

Source: SANDAG, MTS

Private, employer- or community based shuttles also serve the Sorrento Valley Coaster Station. These shuttles typically operate on the same 30-minute headways to connect to Coaster trains. The University of California, San Diego (UCSD), for example, runs fixed route service from various on-campus sites to the Sorrento Valley station.

Tripmaking to and from a relocated Coaster station in Carroll Canyon is based on these current and future assumptions for Coaster and SVCC ridership. Proposed bus rapid transit (BRT) service will

also drive tripmaking in this alternative. It is assumed that two regional BRT Routes will terminate at the proposed BRTC in Carroll Canyon:

1. Route 472 (El Camino BRT): Oceanside to Sorrento Mesa, Peak Headways @ 10 minutes, off-peak @ 10 Minutes

2. Route 680 (I-805 BRT): Otay Mesa to Sorrento Mesa, Peak Headways @ 5 minutes, off-peak @ 10 Minutes

These BRT service routes are still in development, therefore traditional transit vehicle capacities are assumed. Vehicular traffic generated by the proposed 400-space surface parking lot for BRT and Coaster is also assumed.

Figure 14–1 illustrates the baseline intersection lane configurations that were utilized in the analysis. *Figure 14–2* illustrates forecasted Year 2030 traffic volumes with Coaster Station, BRTC, Carroll Cyn Rd Extension and the Carroll Cyn Rd DAR.

14.2 Intersections

Intersection capacity analyses were conducted for the study intersections for the "Coaster/BRTC/DAR" Alternative. *Table 14–1* summarizes the intersection analyses comparison between the "No-build" and the "Coaster/BRTC/DAR" Alternative scenarios. *Appendix Z* and *Appendix 3A* contains the intersection calculation worksheets.

As seen in *Table 14–1*, most intersections under this alternative are calculated to operate at improved levels of service or reduced delay during AM and PM Peak hours with the implementation of this alternative. However, the following intersections would experience increased delay:

- Mira Mesa Boulevard / Scranton Road (during both AM and PM peak hour)
- Mira Mesa Boulevard / Pacific Heights Boulevard (during both AM and PM peak hour)
- Mira Sorrento Place/Scranton Road (during both AM and PM peak hour)
- Oberlin Drive/Scranton Road (during PM peak hour)
- Carroll Cyn Rd/ Scranton Rd (during both AM and PM peak hour)

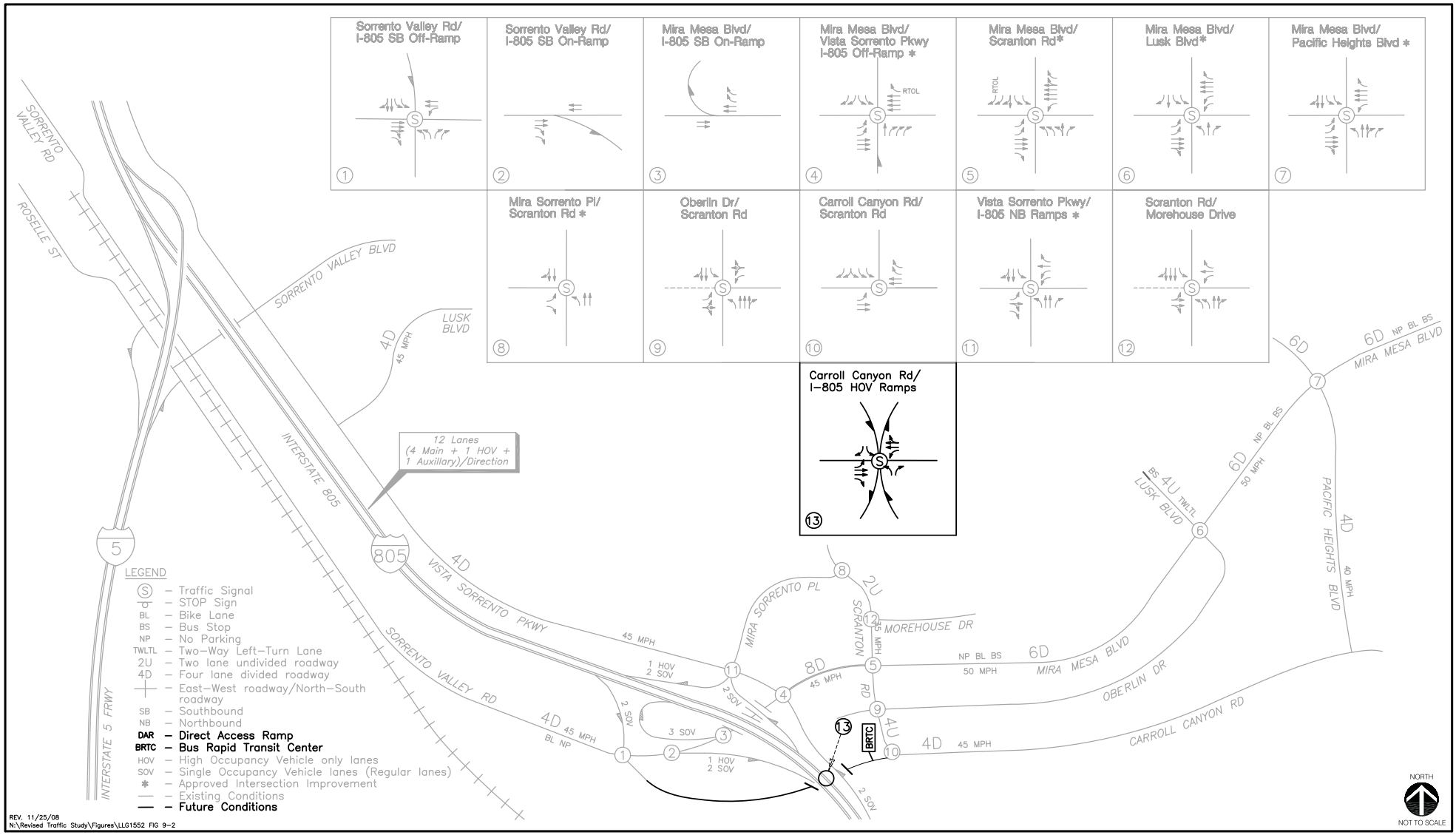

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Figure 14-1

Year 2030 Conditions Diagram
With Bus Rapid Transit Center, Coaster Station, Direct Access Ramps & Carroll Canyon Rd Extension
I-805/Mira Mesa Blvd/ Sorrento Valley Rd Interchange

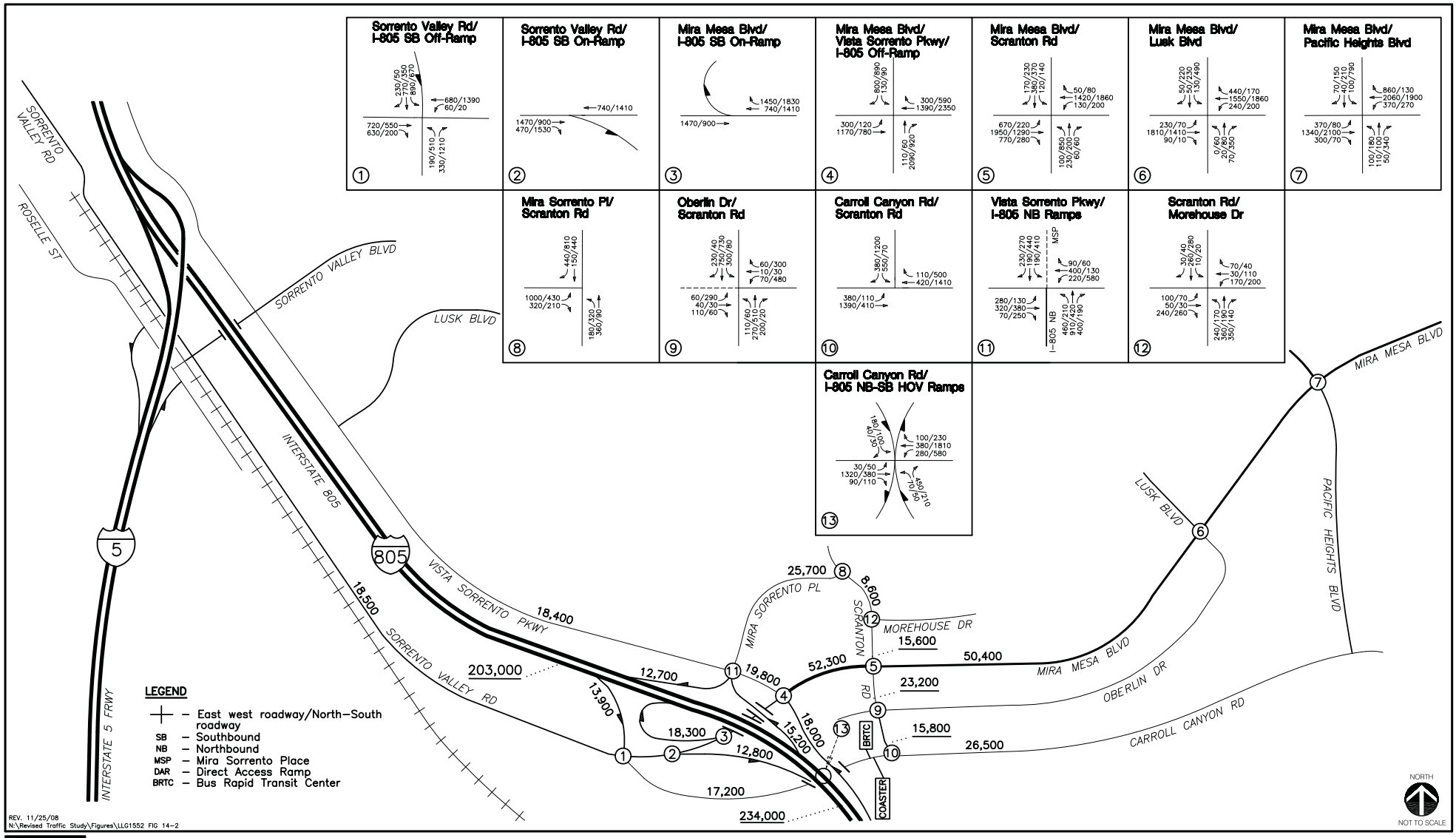

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Figure 14-2

Year 2030 Scenario
With Bus Rapid Transit Center, Coaster Station, Direct Access Ramps & Carroll Canyon Rd Extension
AM/PM Peak Hours & ADTs
I-805/Mira Mesa Blvd/ Sorrento Valley Rd Interchange

TABLE 14–1
YEAR 2030 SIGNALIZED INTERSECTION OPERATIONS

Intersection	Peak Hour	No-Build Delay	No-Build LOS	Coaster/BRTC/DAR Alternative Delay	Coaster/BRTC/DAR Alternative LOS	Change in Delay
Sorrento Valley Rd/ I-805 SB Off ramp/Carroll Canyon Rd. [e]	AM	45.0	D	32.0	C	-13.0
	PM	**>100**	**F**	**>100**	**F**	**-47.8**
Mira Mesa Blvd/ Vista Sorrento Pkwy/ I-805 NB Off ramp [f]	AM	**>100**	**F**	**83.2**	**F**	**->30.0**
	PM	27.4	C	30.2	C	2.8
Mira Mesa Blvd/ Scranton Rd [f]	AM	**>100**	**F**	**>100**	**F**	**19.5**
	PM	**87.4**	**F**	**92.0**	**F**	**4.6**
Mira Mesa Blvd/ Lusk Blvd [f]	AM	22.7	C	20.5	C	-2.1
	PM	29.3	C	32.0	C	2.4
Mira Mesa Blvd/ Pacific Heights Blvd [f]	AM	**57.7**	**E**	**61.0**	**E**	**3.3**
	PM	**>100**	**F**	**>100**	**F**	**8.9**
Mira Sorrento Pl/Scranton Rd [g]	AM	**>100**	**F**	**>100**	**F**	**2.5**
	PM	**>100**	**F**	**>100**	**F**	**8.8**
Oberlin Dr/ Scranton Rd	AM	41.3	D	32.0	C	-9.3
	PM	**64.2**	**E**	**69.9**	**E**	**5.7**
Carroll Canyon Rd/ Scranton Rd [e]	AM	17.8	B	21.7	B	3.9
	PM	19.1	B	32.8	C	13.7
Vista Sorrento Pkwy/I-805 NB Ramps [h]	AM	**68.6**	**E**	**62.7**	**E**	**-5.9**
	PM	**60.3**	**E**	**50.9**	**D**	**-9.4**
Morehouse Dr/ Scranton Rd	AM	30.6	C	29.1	C	-1.5
	PM	38.4	D	37.7	D	-0.7
Carroll Cyn Rd/I-805 DAR [i]	AM	N/A		37.4	D	N/A
	PM			22.1	C	

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. CCR: Carroll Canyon Road Extension
d. DNE: Does Not Exist, no conflicting movements.
e. Intersection Lane Configuration was obtained from the "*Carroll Canyon Road Extension Traffic Impact Analysis*" Report dated April 2005.
f. Intersection Lane Configuration was obtained from the "*Qualcomm Building W Traffic Study*" Report dated April 1, 2004. The improvements suggested in the Traffic Study are under design stage.
g. Intersection Lane Configuration obtained from the "*Mira Sorrento Place Extension Traffic Impact Analysis*" Report dated February 27, 2003.
h. Intersection Lane Configuration was obtained from the "*I-805 Northbound Hook Ramp to Vista Sorrento Pkwy*" Memorandum dated November 27, 2005, submitted by LLG.
i. Intersection Lane Configuration was assumed based on the available right-of-way on Carroll Cyn Rd.

SIGNALIZED

DELAY/LOS THRESHOLDS

Delay	LOS
0.0 < 10.0	A
10.1 to 20.0	B
20.1 to 35.0	C
35.1 to 55.0	D
55.1 to 80.0	E
> 80.1	F

Table 14–2 summarizes the queuing comparison information on all I-805 / Mira Mesa Boulevard / Sorrento Valley Road interchange off-ramps. Appendix AA and Appendix 3B contains the queuing calculation worksheets.

14.3 Intersection Lane Vehicle (ILV) Analysis

Table 14–3 summarizes the ILV analysis results for the signalized intersections on I-805/ Mira Mesa Boulevard / Sorrento Valley Road interchange off-ramps. As seen in *Table 14–3*, all intersections are calculated to operate "Over Capacity" during both AM and PM peak hours except the I-805 DAR ramps/ Carroll Cyn Rd intersection in the AM Peak Hour. However with the "Coaster/BRTC/DAR" alternative, all intersections analyzed had reduced ILV number. *Appendix AB* and *Appendix 3C* contains the ILV analysis worksheets.

14.4 Street Segments

Street segment analyses were conducted for roadways in the study area for the "Coaster/BRTC/DAR" Alternative. *Table 14–4* reports street segment operations on a daily basis. As seen in *Table 13-4*, all study area street segments are calculated to operate at LOS D or better except the following:

- Carroll Canyon Road, East of Scranton Road (LOS E)

TABLE 14–2
OFF - RAMP QUEUE LENGTHS

Off Ramp Location	Model Run: Scenario	Off ramp 95 Percentile Queue Length (ft)					
		AM			PM		
		Left	Through	Right	Left	Through	Right
I-805 NB Off-Ramp to Vista Sorrento Pkwy	No Build	560	480	110	320	280	50
	Coaster/BRTC/DAR	530	460	110	260	220	40
I-805 NB Off-Ramp to Mira Mesa Blvd	No Build	—	120	1480	—	100	220
	Coaster/BRTC/DAR	—	110	1210	—	60	160
I-805 SB Off ramp to Sorrento Valley Rd	No Build	290	450		540	310	
	Coaster/BRTC/DAR	290	370		530	290	

General Notes:

1. Source: Synchro Analysis.
2. Queue lengths rounded to nearest 10 feet.

TABLE 14–3
CALTRANS ILV METHOD INTERSECTION OPERATIONS

Intersection	Scenario	AM		PM	
		ILV[a]	Capacity[b]	ILV	Capacity
I-805 SB Off-Ramp / Sorrento Valley Rd	No Build	**1890**	**Over**	**2070**	**Over**
	Coaster/BRTC/DAR	**1767**	**Over**	**2050**	**Over**
I-805 NB Off-Ramp / Mira Mesa Blvd / Vista Sorrento Pkwy	No Build	**1958**	**Over**	**1796**	**Over**
	Coaster/BRTC/DAR	**1835**	**Over**	**1602**	**Over**
I-805 NB Ramps / Vista Sorrento Pkwy	No Build	**1730**	**Over**	**1650**	**Over**
	Coaster/BRTC/DAR	**1685**	**Over**	**1570**	**Over**
I-805 DAR Ramps / Carroll Cyn Rd	No Build	—	—	—	—
	Coaster/BRTC/DAR	1390	At	**1535**	**Over**

Footnotes:

a. ILV = Intersecting Lane Vehicles.

b. CAPACITY is shown as *UNDER* capacity, *AT* capacity or *OVER* capacity;

Under *Capacity = <1200 ILV/Hour*

At Capacity = >1200 but < 1500 ILV/Hour

Over *Capacity = >1500 ILV/Hour*

TABLE 14–4
STREET SEGMENT OPERATIONS

Segment	Capacity at LOS E	Scenarios				Change in Volume
		No Build		Coaster/BRTC/DAR		
		Volume	LOS[b]	Volume	LOS[2]	
Mira Mesa Blvd						
I-805 SB Off ramp to Vista Sorrento Pkwy	70,000	52,000	C	49,600	C	-2,400
Vista Sorrento Pkwy to Scranton Road	70,000	54,200	C	52,300	C	-1,900
Scranton Road to Lusk Blvd	60,000	50,000	C	50,400	D	400
Sorrento Valley Road						
North of I-805 SB Off ramp	40,000	18,800	B	18,500	B	-300
I-805 SB Off ramp to I-805 SB on-ramp	40,000	24,000	C	21,400	C	-2,600
Vista Sorrento Pkwy						
Lusk Blvd to I-805 NB ramps	30,000	18,600	C	18,400	C	-200
I-805 NB ramps to Mira Mesa Blvd	30,000	20,000	C	19,800	C	-200
Scranton Road						
Mira Sorrento Place to Morehouse Drive	15,000	7,800	C	8,600	C	800
Morehouse Drive to Mira Mesa Blvd	50,000	14,600	A	15,600	A	1,000
Mira Mesa Blvd to Oberlin Dr	50,000	23,000	B	23,200	B	200
Oberlin Dr to Carroll Canyon Rd	40,000	14,000	A	15,800	B	1,800
Carroll Canyon Road						
East of Scranton Road[d]	30,000	**25,900**	**E**	**26,500**	**E**	**600**
West of Scranton Road[d]	30,000	20,600	D	17,200	C	-3,400

Footnotes:
a. ADT – Average Daily Traffic.
b. LOS – Level of Service.
c. CCR – Carroll Canyon Road Extension
d. Assumed to be 4-lane collector in year 2030

General Notes:
1. Delay and LOS worse than LOS D shown in **bold**.

14.5 Freeway Facilities

Freeway segments were analyzed for the "Coaster/BRTC/DAR" Alternative. *Table 14–5* shows the peak hour analysis results for the freeway segments in the project area. As shown in *Table 14-5*, all freeway segments in the project area are calculated to operate at LOS D or better with the following exceptions:

- I-805 Northbound, South of Mira Mesa Blvd Interchange (LOS F(0) in AM Peak Hour)
- I-805 Southbound, South of Mira Mesa Blvd Interchange (LOS E in PM Peak Hour)

14.6 Merge Sections

Ramp merge sections (i.e. on-ramps) were analyzed for the "Coaster/BRTC/DAR" Alternative. *Appendix AC* and *Appendix 3D* contains the ramp merge calculation sheets. *Table 14–6* shows the merge analysis results for the freeway segments in the project area. As shown in *Table 14–6*, all Merge segments in the project area are calculated to operate at LOS D or better.

14.7 Diverge Sections

Ramp diverge sections (i.e. off-ramps) were analyzed for the "Coaster/BRTC/DAR" Alternative. Appendix AD and Appendix 3E contains the ramp diverge calculation sheets. *Table 14–7* shows diverge analysis results for the freeway segments in the project area. As shown in *Table 14–7*, all freeway segments in the project area are calculated to operate at LOS D or better with the following exceptions:

- I-805 Northbound Off-ramp to Vista Sorrento Parkway (LOS F during AM Peak Hour)
- I-805 Northbound Off-ramp to Mira Mesa Boulevard (LOS F during AM Peak Hour)

TABLE 14–5
YEAR 2030 (COASTER/BRTC/DAR) FREEWAY SEGMENT OPERATIONS

Freeway and Segment	Direction	Scenario (Number of Lanes)	Capacity	ADT	Peak Hour Volume		V/C		LOS	
					AM	PM	AM	PM	AM	PM
I-805 North of Mira Mesa Blvd Interchange	NB Mainlines	No-build (4M+1H+1A)	10,400	202,000	8183	6615	0.787	0.636	C	C
		Coaster/BRTC/DAR (4M+1H+1A)	10,400	203,000	8265	6681	0.787	0.636	C	C
	SB Mainlines	No-build (4M+1H+1A)	10,400	202,000	5469	8247	0.526	0.793	B	C
		Coaster/BRTC/DAR (4M+1H+1A)	10,400	203,000	5524	8329	0.526	0.793	B	C
I-805 South of Mira Mesa Blvd Interchange	NB Mainlines	No-build (4M+1H+1A)	10,400	233,000	11933	7175	1.147	0.690	**F(0)**	C
		Coaster/BRTC/DAR (4M+1H+1A)	10,400	234,000	12052	7247	1.147	0.690	**F(0)**	C
	SB Mainlines	No-build (4M+1H+2A)	11,600	233,000	5549	11077	0.478	0.955	B	**E**
		Coaster/BRTC/DAR (4M+1H+2A)	11,600	234,000	5604	11188	0.478	0.955	B	**E**

General Notes:

1. Capacity calculated at 2000 vph per lane and 1200 vph per aux lane (M: Mainline, A: Aux. Ex. 4M+1A=4 Mainline + 1 Aux)
2. Existing ADT Volumes from CALTRANS
3. Peak Hour Percentage (K) and Direction Split (D) for I-805 South of Mira Mesa Blvd Interchange was obtained from Caltrans "2005 Peak Hour Volume Data" Report.
4. Peak Hour Percentage (K) and Direction Split (D) for I-805 North of Mira Mesa Blvd Interchange not available from Caltrans. Therefore, they were estimated based on the 2010 traffic counts on the ramps.
5. Truck Factor was obtained from "2004 Annual Average Daily Truck Traffic on the California State Highway System", August 2005
6. Peak Hour Volume = ((ADT)(K)(D)/Truck Factor)
7. V/C = ((ADT)(K)(D)/Truck Factor/Capacity)

LOS	V/C
A	<0.41
B	0.62
C	0.8
C	0.8
D	0.92
E	1
F(0)	1.25
F(1)	1.35
F(2)	1.45
F(3)	>1.46

TABLE 14–6
RAMP MERGE OPERATIONS

Ramp Merge Location	Scenario	Mainline Facility Before Merge (Rightmost 2 Lanes Only)					Mainline Facility at On-Ramp Merge (Rightmost 2 Lanes Only)					Mainline Facility After Merge (All Mainline Lanes)					Ramp Junction LOS[3]	
		Volume [1]		Capacity [2]	LOS F?		Volume		Capacity	LOS F?		Volume		Capacity	LOS F?			
		AM	PM		AM	PM	AM	PM		AM	PM	AM	PM		AM	PM	AM	PM
I-805 NB On-Ramp from Vista Sorrento Pkwy	No Build	1320	952	4700	N	N	1980	2619	4600	N	N	6974	6221	10400	N	N	A	B
	Coaster/BRTC/DAR	1458	1145	4700	N	N	2014	2615	4600	N	N	7530	6947	10400	N	N	A	B
I-805 SB Loop ramp from Mira Mesa Blvd	No Build	704	1345	4700	N	N	2600	3894	4600	N	N	5265	8985	10400	N	N	B	**C**
	Coaster/BRTC/DAR	802	1671	4700	N	N	2623	3969	4600	N	N	5660	10291	10400	N	**N**	B	D
I-805 SB On ramp from Sorrento Valley Rd	No Build	1264	790	4700	N	N	1959	3025	4600	N	N	5050	10325	11600	N	N	B	C
	Coaster/BRTC/DAR	1409	1080	4700	N	N	1976	2863	4600	N	N	5169	8784	11600	N	N	B	C

Footnotes:

1. Volumes factored up to account for peak hour factor (PHF) and truck percentages and are expressed in vehicles per hour (vph).
2. Capacity based on methodology found in Chapter 25 of the *2000 Highway Capacity Manual (HCM)*. For mainlines, capacity for the mainline section is referred and for ramps, capacity is referred as Ramp junction capacity at the merge influence area.
3. Ramp operations dependent on freeway mainline operations and ramp capacity.

TABLE 14–7
RAMP DIVERGE OPERATIONS

Ramp Diverge Location	Scenario	Mainline Facility Before Diverge (Rightmost 2 Lanes Only)					Mainline Facility at Off-Ramp Diverge (Off-ramp pc/h volume)					Mainline Facility After Diverge (All Mainline Lanes)					Ramp Junction LOS[3]	
		Volume [1]		Capacity [2]	LOS F?		Volume		Capacity	LOS F?		Volume		Capacity	LOS F?			
		AM	PM		AM	PM	AM	PM		AM	PM	AM	PM		AM	PM	AM	PM
I-805 NB Off-Ramp to Vista Sorrento Pkwy	No Build	**5030**	3151	4400	**Y**	N	**2142**	996	2000	**Y**	N	6623	4943	10400	N	N	**F**	C
	Coaster/BRTC/DAR	**4906**	3108	4400	**Y**	N	1980	949	2000	N	N	6711	4951	10400	N	N	**F**	C
I-805 SB Off-Ramp to Mira Mesa Blvd	No Build	**5709**	3137	4400	**Y**	N	2860	1320	3800	N	N	**10956**	6987	10400	**Y**	N	**F**	B
	Coaster/BRTC/DAR	**4759**	2568	4400	**Y**	N	2547	1135	3800	N	N	8506	5511	10400	**N**	N	**F**	B
I-805 SB Off-Ramp to Sorrento Valley Rd	No Build	3139	2954	4400	N	N	2350	1308	3800	N	N	3033	6331	10400	N	N	B	B
	Coaster/BRTC/DAR	3106	3187	4400	N	N	2188	1239	3800	N	N	3530	7493	10400	N	N	B	B

Footnotes:

1. Volumes factored up to account for peak hour factor (PHF) and truck percentages and are expressed in vehicles per hour (vph).
2. Capacity based on methodology found in Chapter 25 of the *2000 Highway Capacity Manual (HCM)*. For mainlines, capacity for the mainline section is referred and for ramps, capacity is referred as Ramp junction capacity at the merge influence area.
3. Ramp operations dependent on freeway mainline operations and ramp capacity.

14.8 Ramp Meters

Ramp meters were analyzed for the "Coaster/BRTC/DAR" Alternative. *Table 14–8* shows the peak hour analysis results for the freeway segments in the project area. As shown in *Table 14–8*, all freeway ramp meters in the project area are calculated to operate at acceptable conditions or better with the following exceptions:

- I-805 Southbound On-ramp from Mira Mesa Boulevard
- I-805 Northbound On-ramp from Vista Sorrento Parkway

TABLE 14–8
RAMP METER OPERATIONS (FIXED RATE METHOD)

Location/Condition	Minimum/ Maximum Rate	Peak Hour Demand [b]	Peak Hour Demand/Lane [c]	Meter Flow Rate/Lane[a]	Excess Demand	Delay (min)	Queue (ft)
I-805 Southbound On-ramp from Sorrento Valley Rd (3:00 PM - 7:00 PM)							
No Build	Min	1930	965	509	456	54	11400
	Max	1930	965	996	0	0	0
Coaster/BRTC/DAR	Min	1540	770	509	261	31	6525
	Max	1540	770	996	0	0	0
I-805 Southbound On-ramp from Mira Mesa Blvd (3:00 PM - 6:30 PM)							
No Build	Min	2030	812	828	0	0	0
	Max	2030	812	996	0	0	0
Coaster/BRTC/DAR	Min	1830	732	828	0	0	0
	Max	1830	732	996	0	0	0
I-805 Northbound On-ramp from Vista Sorrento Parkway (3:00 PM - 7:00 PM)							
No Build	Min	1440	749	197	552	168	13795
	Max	1440	749	348	401	69	10020
Coaster/BRTC/DAR	Min	1270	660	197	463	141	11585
	Max	1270	660	348	312	54	7810

Footnotes:

a. Meter Rates obtained from CALTRANS (Appendix B).
b. Peak Hour Volumes obtained from the existing ramp rata.
c. Lane Utilization Factor obtained from available ramp data.
d. Assumed to have 3-lanes (2 SOV + 1 HOV) and a lane utilization factor of 50% was utilized.
e. Ramp meters were assumed to be operating at unacceptable conditions, if the traffic peak hour demand/lane/hour is greater than the maximum meter rate.

14.9 Coaster/BRTC/DAR Alternative Summary

Tables 14–1 through *14–8* show that several locations would operate at better levels of service with this alternative. These tables also show that a few locations would experience increased delay as expected, especially near the areas surrounding the relocated of Coaster Station.

This alternative provides a multi-modal transportation system with direct access to the freeway HOV lanes. In addition, the following sections discuss the advantages of implementing this alternative.

14.9.1 *Coaster Station Relocation*

Based on the analyses, even though the relocated Coaster Station generates additional trips in the vicinity of the I-805/Mira Mesa Boulevard interchange, the impact is considerably offset by the new DAR.

The following Coaster Station Relocation advantages were derived based on the information contained in the I-5 Corridor /Sorrento Valley Road and Genesee Avenue Interchanges Study dated 1-05-05 (I-5 Study), Sorrento Valley Non-Motorized Access Study dated 1-28-03 (Non Motorized Access Study) and the general advantages of the proposed Coaster Station:

1. The Sorrento existing Valley Coaster Connection and private shuttle services generally run during peak hours and the intersections in the vicinity of the existing Coaster Station already operate at LOS F *(Source: I-5 Study)*. This creates a hindrance for any future expansion of the Coaster station in its current location.

2. Cyclists using the existing Coaster Station are often forced to weave in and out of queuing vehicles at the intersection *(Source: Sorrento Valley Non-Motorized Access Study)*. The relocated Coaster station could provide better access to bicyclists due to reduced queuing problems in the vicinity of the proposed Coaster Station.

3. The pre-emption at the at-grade rail crossings on the Sorrento Valley Boulevard contributes to the congestion and the queuing problems at the already closely spaced intersections. Also, due to the short distance between the crossing and the station, the California Public Utilities Commission (CPUC) requires that the crossing gates remain down for the entire time the southbound trains are at the station *(Source: I-5 Study)*. Currently, Amtrak and Coaster trains must cross Sorrento Valley Boulevard during the AM and PM peak hours, seven and eight times respectively. This rail crossing poses a major conflict with local street circulation, as Coaster and Amtrak trains block Sorrento Valley Boulevard for approximately 50 to 160 seconds *(Source: Sorrento Valley Non-Motorized Access Study)*. Even though the relocation of Coaster Station cannot completely eradicate the pre-emption, there would be a large decrease in the time the gates would be closed.

4. Many potential roadway geometric improvements identified in the I-5 corridor study would impact the existing Coaster Station and some of these improvements have been disregarded due to the high cost associated with the Coaster Station Impacts *(Source: I-5 Study)*. The constraints to improving the I-5 corridor/Sorrento Valley Rd interchange would be lessened if the Coaster station was relocated.

5. In the vicinity of the existing Coaster Station, several operational constraints for the bicyclists were identified in the Non Motorized Access Study. Vista Sorrento Parkway and Mira Mesa Blvd are currently designated as Class II Bike Lanes while Carroll Canyon Road is a Class III Bike Route. The proposed relocation of the Coaster Station along Carroll Canyon Road will provide bicyclists with facilities that will enhance accessibility to the station. Also, according to the May 2002 City of San Diego Bicycle Master Plan several Class I Bike Paths including the Carroll Canyon path to Black Mountain Road and another path from Carroll Canyon Road to Eastgate Mall Road are proposed in this area which will further enhance bicycle access to the proposed relocated Coaster Station.

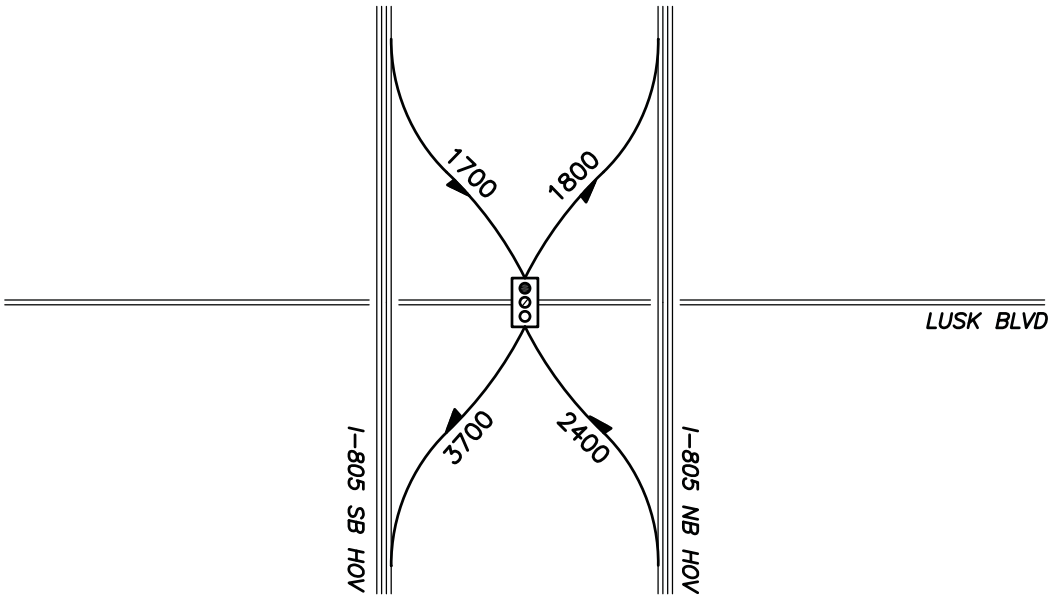
14.9.2 *New BRTC*

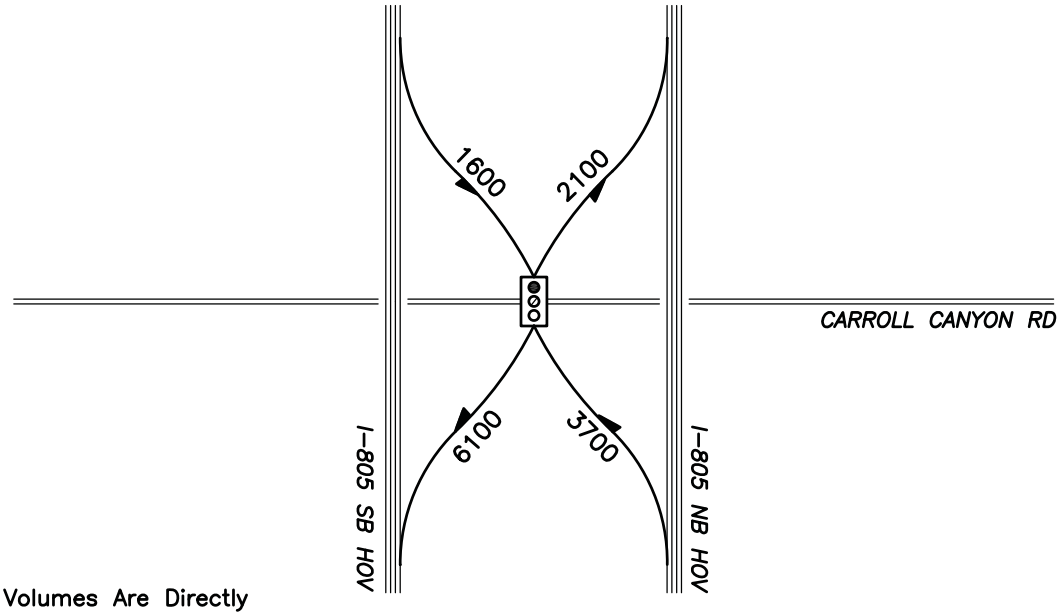
Based on the analyses, even though BRTC Station generates additional trips in the vicinity of the study interchange, the impact is considerably offset by the new DAR. Due to proposed BRTC being adjacent to the freeway and having a DAR to the HOV lanes, this location would be an ideal location for the BRTC. Easy access to the freeway would provide an incentive for the people to carpool and thus would have positive impact to the regional transportation system. In addition it should be noted that a bus transfer station was identified at this location in the Mira Mesa Community Plan (see Appendix C for the excerpts from the Mira Mesa Community Plan).

14.9.3 *Direct Access Ramps (DAR)*

Based on the analyses, the proposed DAR would improve the I-805/ Mira Mesa Blvd/ Sorrento Valley Road interchange considerably. This would provide a means of direct access for the BRTC. Lesser delay at the ramps would encourage people to carpool and thus would have a positive impact on the regional transportation system.

SANDAG Model runs with the Lusk DAR and with the Carroll Cyn Rd DAR were compared to determine the traffic demand for the two DAR's. As indicated in Figure 13-3, the demand at the Carroll Cyn Rd DAR (along with Coaster and BRTC station) would be 3,900 vehicles greater than the Lusk Blvd DAR.





Notes

Ramp ADT Volumes Are Directly (Unadusted) Taken From Sandag Model

NORTH

NOT TO SCALE

REV. 11/17/08
N:\Revised Traffic Study\Figures\LLG1552 FIG 14-3

LINSCOTT LAW & GREENSPAN engineers

Figure 14-3

Year 2030 Ramp ADT Demand in Lusk Blvd DAR & Carroll Canyon Rd DAR

I-805/Mira Mesa Blvd/ Sorrento Valley Rd Interchange

Attachment I

Final Environmental Document

Under separate cover