08-SBd-10-PM 4.1-6.1
EA: 0J400K
October 2010

PROJECT STUDY REPORT

To

Request Conceptual Approval

On Route Interstate 10

Between West of Grove Avenue Undercrossing and East of Fourth Street Interchange

And Grove Avenue Corridor from E. Sixth Street to E. Holt Boulevard

APPROVAL RECOMMENDED: _____
Nassim Elias, Project Manager

APPROVED: _____ 10/27/10
Raymond W. Wolfe, PhD, District Director — Date

08-SBd-10-PM 4.1-6.1
EA: 0J400K
Project Number: 0800000299
October 2010

Vicinity Map

On Route Interstate 10

Between West of Grove Avenue Undercrossing and East of Fourth Street Interchange

And Grove Avenue Corridor from E. Sixth Street to E. Holt Boulevard

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

BRIAN B. BALDERRAMA, P.E.
AECOM USA, Inc.

10-20-10
DATE

Table of Contents

List of Tables

1.0 INTRODUCTION

The Fourth Street Interchange is located in the City of Ontario in San Bernardino County on the Interstate 10 (I-10) Freeway at Post Mile 4.1-6.1 (refer to Attachment 1, Regional Location Map). The proposed improvements are located less than a mile from the Ontario International Airport (refer to Attachment 2, Project Location Map). The improvements would improve traffic circulation in the area and mitigate for the growth impacts while addressing the existing travel demand in the City of Ontario. Three alternatives (1, 2 and 3) to be evaluated in this report all widen Grove Avenue from four to six lanes between I-10 and Holt Street. Alternative 1 is a minimum build option that improves upon the existing I-10/Fourth Street Interchange ramps, widens Fourth Street from Grove Avenue to I-10 freeway and replaces the I-10/Fourth Street Undercrossing (UC) and I-10/Grove Avenue UC. Alternatives 2 and 3 are proposed diamond and partial cloverleaf (respectively) interchanges to be located at I-10/Grove Avenue, eliminate the I-10/Fourth Street interchange, widen Fourth Street from Grove Avenue to I-10 freeway, and replace the I-10/Grove Avenue UC and I-10/Fourth Street UC.

Total project cost at year of expenditure 2014 is estimated at $168 million for alternative 1, $205 million for alternative 2 and $207 million for alternative 3. The total project cost includes construction escalation, support, oversight, construction management, and administration costs. Right of way and construction as noted here are non-escalated and remain the 2010 costs. Each alternative includes a right of way cost of $51 million, $58 million and $57 million, respectively. The capital construction cost for alternatives 1, 2 and 3 is estimated to be $79 million, $98 million and $99 million, respectively. This project is proposed to be funded by the SAFETEA-LU, Interstate Maintenance Discretionary (IMD), Measure I and Developer Impact Fee (DIF) funds by 2014 FY. This improvement is anticipated to go to construction in 2014 and be completed by 2017. This project has been assigned Project Development Processing Category 3. A Project Report (PR) and Environmental Document (ED) will serve as approval of the "selected" alternative. Approval for modifications to existing access points to the Interstate System will be required from the Federal Highway Administration (FHWA) for Alternatives 2 and 3. See the cost estimate (Attachment 10) for specific work items in this project.

Project Limits (Dist., Co., Rte., PM)	08-SBd-10-PM 4.1-6.1
Applicant:	City of Ontario
Funding Source:	SAFETEA-LU, IMD, Measure I, DIF
Capital Construction Costs:	$99,000,000 (Maximum)
Capital Right of Way Costs:	$57,000,000 (Maximum)
Number of Alternatives:	3, Plus the "No-Build"
Proposed Alternative:	Alternative 3
Type of Facility (conventional, expressway, freeway):	Freeway/National Highway
Number of Structures:	2
Anticipated Environmental Determination/Document	February 01, 2013

2.0 BACKGROUND

The existing I-10/Fourth Street Interchange allows on- and off- ramp access to the I-10 freeway from the east/west approach on Fourth Street. The I-10 freeway is an eight-lane freeway between post miles (PM) 4.1-6.1 with a high occupancy vehicle (HOV) lane in each direction. Meaning, the freeway consists of four mixed flow lanes and one HOV lane in each direction. According to the City of Ontario's General Plan, Grove Avenue is a four-lane collector street from north of the undercrossing at I-10 to Holt Boulevard; whereas Fourth Street is classified as a collector street to the west of the I-10 Freeway and a standard arterial to the east of the I-10 Freeway.

This project was initiated with Request for Proposals by the City of Ontario in June of 2007 as a part of the City's initiative to mitigate existing operational, safety, and capacity deficiencies at the existing I-10 Freeway interchange at Fourth Street and its surrounding intersections. City of Ontario and San Bernardino Associated Government (SANBAG) acknowledged the immediate need to improve the freeway and interchange to avoid further operations, safety and capacity failures.

Purpose and Need statements were developed through a series of PDT (Project Development Team) meetings occurring since January 2008. In these meetings various stakeholders including but not limited to Caltrans and its various divisions, SANBAG, City of Rancho Cucamonga, and City of Upland provided inputs on the challenges and opportunities the existing interchange represents. These challenges and opportunities were then turned into the alternative solutions for consensus, feedback and pertinent modifications before arriving at their current configuration.

Three project alternatives and a No-Build alternative were considered in the preliminary conceptual stage and have been carried through the Project Study Report (PSR) process.

3.0 PURPOSE AND NEED STATEMENT

3.1 Need

Currently there is an East and West access to the diamond interchange system at I-10 Freeway and Fourth Street. This system lacks lane capacity in meeting future traffic needs. Demand for higher capacity is a result of the tremendous growth in passenger and goods/trucks movement associated with the Ontario International Airport and overall change in land-use since the interchange was built in the late 1950s.

There are three critical transportation deficiencies in the project area:

1. A number of local street corridors, street intersections, and freeway ramps will suffer from congestion as a result of inadequate capacity to handle future traffic operations leading to the I-10/ Fourth Street interchange resulting from growth in goods movement and truck traffic in the City of Ontario, especially in the vicinity of the Ontario International Airport.

2. The I-10/ eastbound and westbound off-ramps' mobility for truck traffic is severely restricted due to non-standard angle of intersections at their respective location, substandard interchange spacing, storage lengths, weaving distances and inadequate horizontal and vertical clearances on existing lanes, shoulders, and undercrossing.

3. Existing Grove Avenue's roadway cross-section and access to the State and National highway systems are currently inconsistent and non-uniform for its role as an alternate north-south arterial corridor to the I-15 Freeway.

These deficiencies will be further exacerbated by the future year traffic forecasts and anticipated traffic demands for the project area.

3.2 Purpose

The interchange improvements are intended to provide operational, safety and capacity improvements to the interchange system and provide a better, and more uniform access for freeway traffic to local destinations (and vice versa), including to and from the Ontario International Airport. Therefore, the purpose of this project is to:

1. Relieve existing and anticipated future congestion by distributing demand in conformance with the City of Ontario General Plan.

2. Improve traffic operations and mobility to and from the Ontario International Airport, and its future cargo hub facility by Grove Avenue and Holt Boulevard.

3. Provide consistency of access and mobility along Grove Avenue between the freeway interchange and Holt Boulevard.

The I-10/ Grove Avenue Interchange improvement project will accomplish the above objectives and is supported by traffic analysis presented in this PSR.

4.0 DEFICIENCIES

The following sections discuss the data and analyses that support the need for and purpose of this project. It outlines the traffic volumes, the operations and the level of service (LOS) that pertain to the project's relevant street intersections and freeway segments, both for existing and future traffic conditions in a No-Build scenario. Section 6 of this report analyzes the data and traffic operations for 2040 with project for alternatives 1, 2 and 3. The analysis methodology and assumptions for the data presented in this PSR can be found in the Traffic Study by Iteris under *Analysis Methodology* which will be referred to throughout the remainder of this report as "Traffic Study". Excerpts from the Traffic Study are provided as Attachments 4 and 5 of this report.

4.1 Study Area

For each of the alternatives, the study area includes all freeway segments, interchange ramps, and ramp terminus intersections along I-10 from Euclid Avenue to Vineyard Avenue. It also includes key intersections along the north/south roadways of Grove Avenue, Euclid Avenue, and Vineyard Avenue, and east/west roadways including Holt Boulevard and Fourth Street.

All freeway facilities and arterial intersections that could be affected by the I-10/Grove Interchange Improvements Project were included as study locations. Accordingly, the study area includes 25 intersections for the analysis of existing, No-Build and Alternative 1 scenarios and 23 intersections for the analysis of Alternatives 2 and 3.

Figure 2 of the Traffic Study illustrates the study area and the locations of the study intersections analyzed for existing, No-Build, and Alternative 1 Conditions. Figure 3 of the Traffic Study illustrates the study area and the locations of the study intersections analyzed for Alternatives 2 and 3. Lane configurations for each project alternative can be found in Attachment 3 of this report. The inclusion of the parallel City arterials is intended to demonstrate how the proposed improvements will benefit the circulation network in the area.

4.2 Existing, 2017 No-Build, and 2040 No-Build Conditions

For existing lane configurations at intersections refer to Attachment 3 of this report. The existing conditions analysis presents the physical and operational characteristics of the roadway system in the vicinity of the proposed project as shown in Attachment 4 of this report.

The "Opening year (2017) No-Build conditions" section analyzes the short-term traffic operations within the study area and other planned improvements in the vicinity, without the improvements proposed in this PSR. For all methodology assumptions and model roadway network under "No-Build" conditions refer to the Traffic Study.

The "Design year (2040) No-Build conditions" section analyzes forecasted traffic operations of the study area and other planned improvements in the vicinity, but without the improvements proposed in this PSR. Meaning, the forecast volumes are based on a travel demand model that represents the capacity constraints on the roadway network. When corridor demand exceeds the total capacity of the freeway and parallel arterials, the model will assign volume to the roadways that exceed their stated capacity. For all methodology assumptions and model roadway network under "No-Build" conditions refer to the Traffic Study.

4.2.1 Freeway Operations

All freeway mainline and weaving sections currently operate at LOS C or below during one or both peak hours. Tables 7 and 9, provided in Attachment 4, show the freeway mainline and weaving operations for the segments within and adjacent to the project limits for the existing conditions. Tables 18 and 23 in Attachment 5 show the "2017 No-Build" conditions, and Tables

33 and 36 in Attachment 5 show the "2040 No-Build" conditions. Under the "2017 No-Build" alternative, all the study mainline sections would operate at LOS E or F and weaving sections would operate at LOS D or below during one of the peak hours. Under the "2040 No-Build" alternative, all the study mainline and weaving sections would operate at a LOS E or F during both peak hours due to the expected increase in traffic density for the design year.

4.2.1.1 Ramp Operations

All freeway ramps currently operate at LOS C or below during one or both peak hours. Table 8, provided in Attachment 4, shows the freeway ramp level of service for the ramps within and adjacent to the project limits for the existing conditions. Table 20 in Attachment 5 shows the "2017 No-Build" conditions and Table 35 in Attachment 5 shows the "2040 No-Build" conditions. Under the "2017 No-Build" alternative, all the study ramps would continue to operate at LOS D or better during one of the peak hours. Under the "2040 No-Build" alternative, all the study ramps would operate at a LOS F during both peak hours due to the expected increase in volumes and density for the design year.

4.2.2 Intersection Operations

Tables 5, 10 and 25, provided in Attachments 4 and 5 of this report, illustrate the AM and PM peak hour delay and level of service (LOS) under existing, "2017 No-Build" and "2040 No-Build" conditions, respectively, for local intersections within the study area. Under existing conditions, 21 out of 25 study intersections currently operate at acceptable levels (LOS D or better.) Under "2017 No-Build" conditions, 19 out of 25 studied intersections will operate at acceptable levels (LOS D or better.) However, under "2040 No-Build" conditions, 16 out of 25 study intersections would operate at LOS E or F during both peak hours due to projected traffic volumes.

The existing intersection queuing conditions shown in Table 6 of Attachment 4 show the 95th percentile queue exceeding the existing lane storage lengths for some intersections within the project limits. Table 14 shows the intersection queuing analysis for "2017 No-Build" conditions and Table 29 shows the intersection queuing analysis for "2040 No-Build" conditions. Queuing in one lane or more out of every approach in either the AM or PM conditions exceed existing storage lengths under both the "2017 No-Build" and "2040 No-Build" conditions.

4.2.3 Accident Review

Accident data was reviewed for I-10 mainline segments and ramps within the project limits. This evaluation consisted of collecting and reviewing I-10 accident data contained in the Transportation Systems Network (TSN) Traffic Accident Surveillance and Analysis System (TASAS) Table B provided by Caltrans. For the purpose of this project, a three-year accident history was provided from October 2006 through September 2009. Table 1 below summarizes the existing accident rates for both freeway mainline segments and ramps, and compares them to the statewide average accident rates on similar facilities.

Table 1: I-10 Accident History
(October 2006 through September 2009)

Location	Accident Rate[1]					
	Actual			Average		
	F	F+I	Total	F	F+I	Total
I-10 Mainline Westbound (PM 3.0–6.3)	0.002	0.21	0.67	0.012	0.36	1.18
I-10 Mainline Eastbound (PM 3.0–6.3)	0.007	0.30	0.86	0.012	0.36	1.18
Eastbound I-10 Off-ramp to Fourth Street (PM 5.082)	0.000	**0.94**	**2.73**	0.004	0.42	1.20
Westbound I-10 On-ramp from Fourth Street (PM 5.166)	0.000	**0.86**	**1.93**	0.002	0.26	0.75
Eastbound I-10 On-ramp from Fourth Street (PM 5.342)	0.000	**0.68**	**1.35**	0.002	0.26	0.75
Westbound I-10 Off-ramp to Fourth Street (PM 5.391)	**0.133**	**1.46**	**2.39**	0.004	0.42	1.20

Notes:
[1] For mainline sections, the accident rate is the number of accidents per million vehicle-miles. For ramps, the accident rate is the number of accidents per million vehicles.
Bold font indicates any actual accident rate that is higher than the average accident rate.
F = Fatal
F+I = Fatal + Injury
Source: Caltrans District 8 TASAS, Table B

As shown in Table 1, the total accident rates at four out of six analyzed locations are higher than the statewide average for similar facilities.

The percentages of accidents by accident type for freeway mainline and all the ramps were evaluated for the project area. For the mainline, types of accidents include 58.47% rear end, 19.44% sideswipe, 17.82% hit objects, and 4.27% were other. The primary collision factor was use of excessive speed (49.93%); followed by 20.62% for other violations, 12.67% were improper turning movement related, 5.15% were following too closely, 5.74% were under the

influence of alcohol, 3.83% were other than driver, 1.62% were unknown, and 0.44% were due to improper driving.

For the ramps, a similar pattern of types of accidents and collision factors as described for the mainline segment were recorded. The primary collision factor for both the ramps and mainline was excessive speed.

The I-10/Grove Avenue Interchange Improvement Project will alleviate the identified safety problems. All proposed on-ramps will contain both a mixed use lane and HOV bypass lane in addition to being metered.

5.0 CORRIDOR AND SYSTEM COORDINATION

Based on the Regional Transportation Plan (RTP) for the region, the Regional Transportation Improvement Program (RTIP) lists all the regional funded/programmed improvements in the programming cycle. Both documents are prepared by the regional Metropolitan Planning Organization (MPO); in this case, the Southern California Association of Governments (SCAG). On December 4, 2008, the Regional Council of SCAG adopted Amendment #1 to the 2008 RTP and Amendment #08-01 to the RTIP. The Amendments were developed as a response to changes to projects in the 2008 RTP. The proposed project is included in the currently approved 2008 RTP and 2008 RTIP under identification number 2002160. As such, it is in conformance with the transportation conformity requirements. As required, SCAG will amend the adopted RTP to ensure that all projects revisions and additions are correctly reflected. When Federal approval of the RTIP is received, additional projects may then be submitted for inclusion in the RTIP. When the preferred alternative is selected, it can then be considered for inclusion in both adopted documents.

Within the I-10/Grove Improvement Project limits, the Route Concept Report (RCR), adopted March 29, 2000, requires four continuous mixed flow lanes and a HOV lane in the eastbound and westbound directions along Interstate 10 from State Route 83 to Interstate 15. The existing lanes on Interstate 10 meet the requirements of the RCR and no future expansion of the freeway is required for the purposes of this interchange project.

The proposed reconstruction of Grove Avenue and Fourth Street interchange is consistent with and has been coordinated with local and regional improvement programs and initiatives. It is anticipated that the interchange reconstruction will result in new multi-family residential and commercial development opportunities that are created through lot consolidation and City and private reinvestment. These opportunities will result in safer, functional and aesthetically pleasing developments that provide needed housing and viable commercial choices while addressing the changes in property access anticipated with the interchange reconstruction.

There are currently no other programmed improvement projects within or adjacent to this project limits.

6.0 ALTERNATIVES

Improvements to the existing I-10 Freeway, Grove Avenue and the Fourth Street Interchange are intended to serve the anticipated growth surrounding the study area driven primarily by passenger and cargo demands of the Ontario International Airport.

6.1 No-Build Alternative

For comparison purposes, this study includes a no-build alternative. This alternative is analyzed under opening year (2017) and design year (2040) conditions, and assumes no improvements at the I-10 Freeway, Fourth Street Interchange or Grove Street; the lane configurations at the ramp terminal intersections would remain unchanged as well. The No-Build alternative would require no capital expenditure at this time. Traffic operations are expected to continue to degrade as the area develops and associated traffic volumes increase. Longer durations of congested conditions may be expected to increase noise levels, reduce air quality and decrease safety in the vicinity of the project area. This alternative would not satisfy the purpose and need of this project. "No-Build" forecasted traffic operations conditions were documented and analyzed in Section 4 – *Deficiencies* of this PSR and will be referenced throughout the following sections as needed.

6.2 Project Alternatives

Three project alternatives in addition to the No-Build option were considered for the I-10/Grove Avenue Interchange project. All three alternatives would improve traffic operations within the study area and are discussed in detail within this section. All three interchange alternatives will have the same three local improvement alternatives. The widening of Grove Avenue will be discussed under alternative 1 only, as the improvement is identical for all three interchange alternatives.

6.2.1 Alternative 1: Minimum Build Alternative

Alternative 1 proposes the following modifications of the existing interchange (also see Attachment 7):

- Adjustment of the existing westbound on-ramp terminus at Fourth Street.
- Adjustment and widening of the existing westbound off-ramp terminus at Fourth Street.
- Addition of left-turn lane and realignment of the existing eastbound off-ramp to Fourth Street.
- Realignment of the existing eastbound on-ramp from Fourth Street.
- Addition of auxiliary lane to eastbound I-10 freeway from 1,000 feet West of Grove Avenue to 700 feet East of Grove Avenue.

- Widening of Grove Avenue from Virginia Avenue to Holt Boulevard.
- Widening of Fourth Street from Virginia Avenue to 150 feet east of North Baker Avenue.

I-10
The current eight-lane freeway segment from post mile 4.1 through 6.1 ("A" line, as shown in Attachment 7) has a High Occupancy Vehicle (HOV) lane in each direction. Meaning, the freeway consists of four mixed flow lanes and one HOV lane in each direction. The eastbound direction will be widened for the addition of an auxiliary lane from 1,000 feet West of Grove Avenue to 700 feet East of Grove Avenue for added deceleration length in advance of the eastbound off-ramp at Fourth Street. The mainline widening will be an offset of 12 feet from the existing outside edge of traveled way and a type 1 retaining wall will be used to contain the additional fill material from I-10 within Caltrans right-of-way.

Fourth Street
The existing Fourth Street ("BE" line) undercrossing (UC) (Bridge No. 54-440) will be widened to accommodate three through lanes and two dual left turn lanes in each direction (see Attachment 7 cross section). The advanced planning study for this widening is discussed in section 6.2.1.6 of this report. From Virginia Avenue to Calaveras Avenue, Fourth Street will use the City of Ontario cross section to minimize impact to John Galvin Park. From Calaveras Avenue to North Baker Avenue, the cross section of Fourth Street will transition from the City cross section to a Caltrans compliant cross section within Caltrans right-of-way and back to existing condition.

Fourth Street Westbound On-Ramp
The existing on-ramp ("B1" line) will remain unchanged as a single-lane ramp with an HOV lane until station 16+50 where the horizontal and vertical alignment will be adjusted to match the Fourth Street Widening. The proposed improvements will extend the outside lane width to the intersection curb return to accommodate dual left turn movement whereas the existing condition transitioned from one 18-foot lane to two 12-foot lanes at station 17+80.

Fourth Street Westbound Off-Ramp
This off-ramp ("B2" line) will be widened at the terminus to accommodate dual left turns and one widened right turn and adjusted both horizontally and vertically to match the Fourth Street Widening. The widening will not impact an existing soundwall on type 1 retaining wall. From station 13+20, the remainder of the existing single lane off-ramp will remain unchanged by the improvements.

Fourth Street Eastbound Off-Ramp
The realigned off-ramp ("B3" line) will connect to I-10 at station 265+00 along the "A" line and replace the existing off-ramp alignment. The revised off-ramp is necessary to align with proposed eastbound on-ramp and avoid impacting the proposed Fourth Street UC abutment.

From station 5+00 to station 10+00, a proposed type 1 retaining wall will be constructed along the right edge of shoulder and side slope will remain 2:1 to minimize right-of-way impact from the interchange improvements. At station 10+00 the off-ramp will be widened to accommodate dual left turn lanes and a free right turn which will connect to the widened outside edge of traveled way 80 feet West of North El Dorado Avenue. The widening at this location will impact an existing type 1 retaining wall along the I-10 edge of shoulder that will be replaced by this project.

Fourth Street Eastbound On-Ramp
The existing on-ramp ("B4" line) will be realigned at the terminus with the widened Fourth Street to provide a proper dual left turn movement from westbound Fourth Street onto the ramp. The realigned ramp will conform to existing at approximately station 11+90 and require reconstruction of the existing Type 1 retaining wall and Type 1 retaining wall on soundwall along the edge of shoulder from station 7+10 to station 13+00. The proposed improvements will begin the metal beam guard rail at station 5+50 and transition to a Type 1 retaining wall at 6+20. The Type 1 retaining wall will end at station 8+00 where a soundwall on Type 1 retaining wall will begin. The proposed soundwall on retaining wall will conform to the existing soundwall on Type 1 retaining wall at station 13+00. Behind the proposed wall a temporary easement will be required for the construction of the structures and the new right of way line will be constructed on the proposed wall layout line. (See section 6.2.1.9 of this report for additional right of way impact information.)

Grove Avenue
The existing Grove Avenue ("GE" line) will conform to existing at Virginia Avenue and be widened to accommodate three through lanes in each direction at the undercrossing (see Attachment 7 cross section). The Grove Avenue cross section at the UC (Bridge No. 54-441) will continue until 1,000 feet South of East Princeton Street where it will transition to the City of Ontario cross section for the remainder of the interchange improvement section. Approximately 1,220 feet south of the Grove Avenue/Fourth Street intersection, the interchange improvements end and the local improvements for the corridor widening begin, which are not part of the interchange project.

Three alternatives were considered for the local improvements of Grove Avenue which extend from the interchange improvements south to the intersection with Holt Boulevard (Attachment 7). All three alternatives widen the Grove Avenue from the existing four lane cross section to a six lane AASHTO compliant section from the interchange improvements south to G Street. South of G Street to 1,000 feet north of the intersection with Holt Boulevard, Grove Avenue is widened to the City of Ontario divided arterial typical section. At 1,000 feet north of the intersection the transition to a six lane cross section with dual left turn lanes and a right turn lane begins. The transition is complete 500 feet north of the intersection and the full width cross section continues until 525 feet south of the intersection, where the transition to match the existing cross section begins. All three alternatives restrict left turn movements from Elma Street and Nocta Street onto Grove Avenue.

All three local improvement alternatives widen Grove Avenue about the existing centerline between the interchange section and G Street to eliminate impacts to the park properties. The first alternative for the local improvement section widens Grove Avenue symmetrically about the existing centerline from G Street south to the intersection with Holt Boulevard, impacting property on both sides of Grove Avenue. The second alternative widens Grove Avenue to the east of the existing centerline from G Street south to the intersection of Holt Boulevard, minimizing property impacts on the west side of Grove Avenue. The third alternative widens Grove Avenue to the west of the existing centerline from G Street south to the intersection of Holt Boulevard, minimizing property impacts on the east side of Grove Avenue.

6.2.1.1 Freeway Operations

For the Opening Year 2017, Project Alternative 1 AM and PM peak hour levels of service for the study area freeway weaving and mainline segments are identical to No-Build conditions summarized in Attachment 5 of this report in Table 23 and 18. The westbound I-10 weaving segment between Vineyard Avenue and Archibald Avenue is projected to operate at an unsatisfactory level of service during the PM peak hour. Per Table 18, the following freeway mainline segments are projected to operate at unsatisfactory levels of service under No-Build and 2017 Project Alternative 1 conditions:

- I-10 EB between Euclid Avenue and Fourth Street (AM & PM peak hours)
- I-10 EB between Fourth Street and Vineyard Avenue (AM & PM peak hours)
- I-10 WB between Fourth Street and Vineyard Avenue (PM peak hour)
- I-10 WB between Euclid Avenue and Fourth Street (PM peak hour)

For the Design Year 2040, Project Alternative 1 AM and PM peak hour levels of service for the study area freeway weaving and mainline segments are also identical to No-Build conditions summarized in the Attachment 5 in Tables 36 and 33. Per Table 33, all freeway segments are projected to operate at unsatisfactory levels of service. Both eastbound and westbound I-10 weaving segments between Vineyard Avenue and Archibald Avenue are projected to operate at LOS F during the AM and PM peak hour as seen in Table 36.

The freeway operational deficiencies will not be caused by or aggravated by the proposed project.

6.2.1.1.1 Ramp Operations

Year 2017 Alternative 1 AM and PM peak hour levels of service for the freeway ramp influence areas are identical to No-Build conditions summarized in Table 20. The ramp merge/diverge areas are projected to operate at unsatisfactory levels of service because the freeway mainline will be over capacity. These conditions are not caused or aggravated by the proposed project.

Year 2040 Alternative 1 AM and PM peak hour levels of service for the freeway ramp influence areas are identical to 2040 No-Build conditions summarized in Table 35 of Attachment 5 of this

report. The ramp merge/diverge areas are projected to operate at unsatisfactory levels of service because the freeway mainline will be over capacity. These conditions are not caused or aggravated by the proposed project. Although the merge and diverge areas are forecast to operate at LOS F, the queues at the ramp terminus intersections are projected to improve as a result of implementation of the proposed project.

6.2.1.2 Intersection Operations

Level of Service Analysis

Table 11 of Attachment 5 shows the level of service, delay and volume-to-capacity ratio for the study intersections under opening year 2017. Project Alternative 1 would improve three of the six intersections that would operate at LOS E or F under No-Build conditions to an acceptable LOS D or better, resulting in a total of 22 out of 25 study intersections that would operate at an acceptable LOS under Alternative 1. The three intersections are:

- Grove Avenue/5th Street (from LOS F to A in the AM and PM)
- Grove Avenue/Princeton Street (from LOS F to A in the AM and PM)
- Grove Avenue/Holt Boulevard (from LOS E to C in the PM only)

For design year 2040, Table 26 of Attachment 5 shows that project Alternative 1 would improve five of the 16 intersections that would operate at LOS E or F under No-Build conditions to an acceptable LOS D or better, resulting in a total of 11 out of 25 study intersections that would operate at LOS E or F under Alternative 1. The five intersections are:

- Grove Avenue/5th Street (from LOS F to B and A in the AM and PM, respectively)
- Grove Avenue/Princeton Street (from LOS F to A in the AM and PM)
- Grove Avenue/Fourth Street (from LOS F to C in the AM and PM)
- I-10 Eastbound Ramps/Fourth Street (from LOS F to B in the AM and PM)
- I-10 Westbound Ramps/Fourth Street (from LOS C and F to B in the AM and PM)

Overall, for opening year 2017, Alternative 1 would improve the peak hour traffic operations at 22 out of 25 study intersections with less delay and/or better LOS compared to No-Build conditions, during one or both peak hours. None of the 25 study intersections would expect a higher delay during both peak hours under Alternative 1, compared to No-Build conditions. None of the study intersections would degrade in LOS. For design year 2040, Alternative 1 would improve the peak hour traffic operations at 15 out of 25 study intersections with less delay and/or better LOS compared to No-Build conditions during both peak hours. Only five study intersections would expect a higher delay during both peak hours under Alternative 1 compared to No-Build conditions. No studying intersection would degrade a LOS E or F.

Queue Analysis

Under Project Alternative 1 for the 2017 opening year, all of the storage lanes have sufficient space provided to accommodate the vehicle queue during the AM and PM peak hours, as seen in Table 15 of Attachment 5. Additionally, Project Alternative 1 would reduce the 95th percentile queue at the Fourth Street/Grove Avenue southbound and westbound left and through lanes compared to the No-Build Alternative.

For the 2040 design year, Project Alternative 1 would reduce the change in length for the 95th percentile queue at 14 of the 15 storage lanes for the both AM and PM peak hours within or adjacent to the project limits, compared to the No-Build Alternative for the design year (2040). However, as can be seen in the Table 30 of Attachment 5, the southbound left turn lane on Grove Avenue at Fourth Street, the southbound left-turn lane on the I-10 Eastbound Off Ramp at Fourth Street, the northbound left-turn lane on the I-10 Westbound Off Ramp at Fourth Street, and the eastbound left-turn lane on Fourth Street at Baker Avenue, are all forecast to have inadequate queuing space during the AM or PM peak hours. Additionally, the queue length of the westbound through lanes on Fourth Street at Grove Avenue is forecast to be longer than the adjacent left-turn pocket storage length during the AM and PM peak hours, resulting in potential blockage of the left-turn pocket.

6.2.1.3 Design Exceptions

Tables 2 through 6 below summarize the nonstandard features for alternative 1. The "A" Line design exceptions for the I-10 freeway mainline remain the same for all three alternatives; thus, they are only presented in this section but are referenced in Sections 6.2.2.3 and 6.2.3.3. Project Alternative 1 contains 14 mandatory design exceptions and 20 advisory design exceptions. Of the 14 mandatory design exceptions, eight are existing and six are proposed. Of the 20 advisory design exceptions, 11 are existing and nine are proposed.

Table 2: I-10 - "A" Line

Exception	Index	Description	Standard	Existing to Remain
Mandatory	501.3	Interchange Spacing	1 mile	Fourth Street to Vineyard - 0.8 mi
Mandatory	301.1	Lane Width	12' Lanes	#1 Mixed Flow & HOV lane in both directions are 11'
Mandatory	305.1 (3a)	Median Width	22'	18'
Mandatory	302.1	Shoulder Width (inside)	10'	8'
Mandatory	201.1	Sight Distance Standards	750'	723.48'
Mandatory	201.1	Sight Distance Standards	750'	486.73'

Table 3: Fourth Street Westbound On-Ramp - "B1" Line				
Exception	Index	Description	Standard	Proposed or [Existing to Remain]
Advisory	202.5 (1)	Superelevation Transition	200'	[120']
Advisory	202.5 (2)	Superelevation Runoff	2/3 - 1/3	[1/2 - 1/2]
Mandatory	202.2	Standards for Superelevation	12%	[2%]
Advisory	203.5	Compound Curves	1333'	[500']
Advisory	204.4	Vertical Curves	500'	[200']
Advisory	204.4	Vertical Curves	200'	[150']
Mandatory	201.5	Sight Stopping Distance for Sag Curves	SSD = 430'	[SSD = 303']
Advisory	403.3	Angle of Intersection	$x \geq 75^0$	[43°07'20"]
Mandatory	302.1	Shoulder Width (Rt) Soundwall	10'	8'
Mandatory	504.3 (d)	Ramp Lane Drop Taper	15 to 1	14 to 1
Mandatory	309.1 (3b)	Horizontal Clearance (Rt) (Soundwall)	10'	8'
Advisory	304.1	Side Slopes 4:1 or Flatter	4 to 1	[2 to 1]

Table 4: Fourth Street Westbound Off-Ramp - "B2" Line				
Exception	Index	Description	Standard	Proposed or [Existing to Remain]
Advisory	504.2 (2)	Freeway Exit Standard Design	4°52'08"	[2°57'56"]
Mandatory	202.2	Standards for Superelevation	12%	2%
Advisory	202.5 (1)	Superelevation Transition	150'	40'
Advisory	202.5 (2)	Superelevation Runoff	2/3 - 1/3	1/2 - 1/2
Mandatory	203.2	Standards for Curvature	215'	100'
Advisory	203.5	Compound Curves	266'	100'
Advisory	304.1	Side Slopes 4:1 or Flatter	4 to 1	[2 to 1]

Table 5: Fourth Street Eastbound Off-Ramp - "B3" Line				
Exception	Index	Description	Standard	Existing to Remain
Advisory	403.3	Angle of Intersection	$x \geq 75^0$	62°28'04"
Advisory	304.1	Side Slopes 4:1 or Flatter	4 to 1	2 to 1

Table 6: Fourth Street Eastbound On-Ramp - "B4" Line				
Exception	Index	Description	Standard	Proposed
Advisory	202.5 (1)	Superelevation Transition	210'	180'
Advisory	202.5 (1)	Superelevation Transition	360'	300'
Advisory	202.5 (2)	Superelevation Runoff	2/3 - 1/3	1/2 - 1/2
Advisory	304.1	Side Slopes 4:1 or Flatter	4 to 1	2 to 1
Advisory	403.3	Angle of Intersection	$x \leq 75^0$	31°51'43"
Mandatory	504.3 (d)	Ramp Lane Drop Taper	15 to 1	14 to 1
Advisory	504.2 (5)	Cross Slopes	$x \leq 5\%$	$5\% \leq x \leq 16\%$

6.2.1.4 Storm Water Data Report

The project is located in an urbanized area of the Cucamonga Creek watershed and within the Chino (split) Hydrologic Sub-Area (HSA) 801.21. The segment of the Cucamonga Creek that will be affected is the Valley Reach and is included in the current impaired water body 303(d) list. There is no Target Design Constituent (TDC) for this project as the nearest 303(d) listed receiving water body is more than four miles downstream of the site.

Since there are no TDCs, this project will consider some treatment best management practices (BMPs) for general purpose pollutant removal. The storm water runoff will be treated before it drains into the Cucamonga Creek. Additionally, no existing treatment BMPs were discovered within the project limits or associated with this project.

During construction, temporary BMPs will be implemented and maintained by the contractor over the estimated two-year construction period. This will ensure slope stabilization and sediment control; minimize tracking; prevent wind erosion; and address construction site management–related pollutants from being introduced into the storm water runoff.

All construction activities within Caltrans' right-of-way must conform to the Department's Statewide NPDES storm water permit, Order No. 99-06-DWQ, NPDES No. CAS 000003 in addition to the responsibilities specified in the Department's Statewide Storm Water Management Plan (SWMP). The project must also conform to the requirements for the General NPDES Permit for Construction activities, Order No. 2009-0009-DWQ, NPDES No. CAS 000002, and subsequent permit General Permit in effect at the time of project activity.

6.2.1.5 Transportation Management Plan

The TMP for this project will provide options for minimizing potential construction impacts and traffic disruptions, and ensure the safety of workers and public in the construction area. A TMP will be prepared during the PS&E stage; a data sheet has been provided in Attachment 14 of this report. The report will include one or all of the following elements:

- Public awareness campaign
- Traffic system and signing package
- Incident and demand management
- Construction and alternative route strategies
- Advanced transportation management system (ATMS)

6.2.1.5.1 Staging

Construction of the project will be staged to minimize traffic through and around the project site. Fourth Street UC and Grove Avenue UC will be constructed in two main stages as shown in the Advanced Planning Study. These activities are also identified in the overall staging in Stages 2 and 3 below. All stakeholders have agreed in the PDT meetings that it is acceptable to reduce the

I-10 lanes from five in each direction to four in each direction within the project limits during these construction stages. The HOV lanes will be merged into the adajacent Mixed Flow lane to achieve this reduction in number of lanes. To maintain all five lanes in each direction may require bridge construction in 3 stages and either construction of bridges wider than otherwise needed or construction of temporary bridges. These choices may have additional impacts on right of way, utilities, geometrics, or vertical clearance over local streets and will be an additional construction time and cost to the project.

Given the additional throw-away costs and potential impacts, the project stakeholders conceptually agreed to reduction of freeway lanes during construction for the PSR level studies. However, this issue must be addressed in more detail during the PA/ED phase and final concurrence obtained from Caltrans and FHWA. Generally, the interchange improvement staging will consist of four phases:

Stage 1 Construction
Stage 1 construction activities will consist of constructing the Grove Avenue corridor widening into phases to reduce impact to traffic; widening along Fourth Street (without impacting the existing ramps); and shifting of existing I-10 median concrete barrier back to freeway centerline at the Fourth Street Interchange location.

Stage 2 Construction
Stage 2 construction activities will consist of demolishing the existing Grove Avenue and Fourth Street UC I-beam structures in both directions; replacement and widening of demolished Grove Avenue and Fourth Street UC structures; reconstruction of I-10/westbound ramps intersection; adjustment of westbound on- and off-ramp to match Fourth Street widening; and construction of I-10 eastbound auxiliary lane.

Stage 3 Construction
Stage 3 construction activities will consist of demolishing the remaining existing Grove Avenue and Fourth Street UC structures in both directions; replacement and widening of demolished Grove Avenue and Fourth Street UC structures; reconstruction of I-10/eastbound ramps intersection; and adjustment of eastbound on- and off-ramp to match Fourth Street widening.

Stage 4 Construction
Stage 4 construction activities will consist of connecting the outer and center structure portions of the proposed Grove Avenue and Fourth Street UCs and widening of the remaining Fourth Street to ultimate condition.

6.2.1.6 Structures Advance Planning Study

An Advanced Planning Study (APS) report has been prepared for the project structures. All three alternatives require the existing bridge structures be removed and replaced with longer and shallower structures. The three alternatives will widen Fourth Street and Grove Avenue to different widths (as shown in Attachment 7 of this report), but result in a two span continuous

concrete bridge at both interchanges in order to reduce the required structure depth, with a center bent and tall cantilever type abutments. An overview of the key findings from the APS is shown below. A general plan for each structure is included in Attachment 8.

6.2.1.6.1 Fourth Street Undercrossing, Bridge No. 54-440

The existing Fourth Street Undercrossing (UC) is a single span concrete bridge carrying I-10 freeway traffic approximately 99.5 feet long with large skew angle of approximately 55.5 degrees. The original bridge is a 6'-0" deep Cast-In-Place Reinforced Concrete (CIP/RC) box girder bridge built in 1952 and was widened three times since: one in 1961 with 6'-0" deep Cast-In-Place Prestressed (CIP/PS) concrete box girders to fill the median gap, one in 1971 with 6'-0" deep CIP/PS concrete box girders on the outsides in both EB and WB directions, and the latest previous widening was completed in 1998 with 4'-9" deep Precasted Prestressed (PC/PS) concrete I-girders on the outsides in both EB and WB lanes and removing the old widening built in 1971. The existing bridge and approaching roadway have a substandard 1% cross slope on each direction.

The existing vertical clearance, as shown on the latest widening as-built plans dated 6/3/96, was 15'-3" for the original structure and 15'-9" for the 1998 widening. However, site visit revealed the minimum vertical clearance is actually only 14'-6" as posted on the outside girder face over the roadway, which is less than the acceptable 15' minimum Caltrans standard for a local street. The minimum vertical clearance is controlled by the original structure. The discrepancy in current posted minimum vertical clearance and the previous vertical clearance as indicated in the previous widening plans is probably due to street maintenance resurfacing over the years.

The replacement bridge will meet the 15 feet minimum vertical clearance and the minimum of 2% cross slope requirements. Alternative 1 requires lengthening the Fourth Street UC bridge (a proposed continuous two-span structure) considerably with length of 142'-2" per span, which is about 43% longer than the existing single span structure. Because the existing minimum vertical clearance is already substandard at 14'-6" for the Fourth Street UC, in order to meet the 15' minimum vertical clearance requirement, the replacement structure depth to span ratio for the new Fourth Street UC bridge proposed in Alternative 1 has to be about 0.032, which is much shallower than the Caltrans and AASHTO recommended minimum depth to span ratio of 0.04 commonly used for continuous multi-span bridges. This will require thorough investigation, review and approval from Caltrans HQ Structures. Another way to meet both the minimum vertical clearance of 15' and the recommended minimum depth to span ratio of 0.4 for the proposed Fourth Street UC bridge is to lower the street profile by about one foot at the interchange, which is also very costly to do considering there are many underground utilities under the local street coupled with local area drainage issue because lowering the street profile will create a area low point at the interchange.

6.2.1.6.2 Grove Avenue Undercrossing, Bridge No. 54-441

Similar to the existing Fourth Street UC, Grove Avenue UC is also a single span concrete bridge carrying I-10 freeway traffic approximately 83.33 feet long with moderate skew angle of approximately of 34.73 degrees. The original bridge is a 4'-8" deep CIP/RC box girder bridge built in 1952 and was widened three times since: one in 1961 with 4'-8" deep CIP/PS concrete box girders to fill the median gap, one in 1971 with 4'-8" deep CIP/PS concrete box girders on the outsides in both EB and WB directions, and the latest previous widening was completed in 1998 with 4'-6" deep PC/PS I-girders on the outsides in both EB and WB lanes and removing the old widening built in 1971.The existing bridge and approaching roadway have a substandard 1% cross slope on each direction.

The existing vertical clearance, as shown on the latest widening plans dated 6/11/96, was 15'-6" for the original structure and 15'-4" for the 1998 widening. However, site visit revealed the minimum vertical clearance is actually only 15'-3" as posted on the girder over roadway, which is above the acceptable 15' minimum Caltrans standard for a local street. The minimum vertical clearance is controlled by the 1998 widened portion of structure. The discrepancy in current posted minimum vertical clearance and the previous vertical clearance as indicated in the previous widening design plans is probably due to street maintenance resurfacing over the years. The replacement bridge will meet the 15 feet minimum vertical clearance and the minimum of 2% cross slope requirements.

6.2.1.7 Utility Involvement

A utility agreement and a notice to Owner will be required for this project. A utility information request has been sent to all utility owners within the project limits. As a result of this coordination and field review, only the utility facilities expected to be involved during construction are identified below. The facilities shown will all require relocation expenses separate from the other utility impacts covered in the roadway items of the preliminary project total cost estimate in Attachment 10 of this report.

Involvement due to interchange improvements:

Southern California Gas Company	
Location	Utility Type
Fourth Street UC	6" Low Risk Gas Line
Grove Avenue UC	6" Low Risk Gas Line

Time Warner	
Location	Utility Type
Fourth Street/EB Ramp Intersection	Overhead Fiber Optic Cable Lines
Grove Avenue - UC to E. Princeton Street	
Fourth Street - Calaveras Avenue to UC	

Verizon	
Location	Utility Type
Fourth Street/EB Ramp Intersection	Overhead Fiber Optic Telephone Lines
Grove Avenue - UC to E. Princeton Street	
Fourth Street - Calaveras Avenue to UC	

Southern California Edison	
Location	Utility Type
Fourth Street/EB Ramp Intersection	Overhead Electrical Lines
Grove Avenue - UC to E. Princeton Street	
Fourth Street - Calaveras Avenue to UC	

Involvement due to local improvements:

Verizon	
Location	Utility Type
Grove Avenue - E. Princeton Street to Fourth Street Intersection, E. I Street to E. G Street, and E. D Street to E. Holt Boulevard	Overhead Fiber Optic Telephone Lines
Fourth Street - 500 feet W. of Grove Avenue to Calaveras Avenue	

Time Warner	
Location	Utility Type
Grove Avenue - E. Princeton Street to Fourth Street Intersection	Overhead Fiber Optic Cable Lines
Fourth Street - 500 feet W. of Grove Avenue to Calaveras Avenue	

Southern California Edison	
Location	Utility Type
Fourth Street/EB Ramp Intersection	Overhead Electrical Lines
Grove Avenue - UC to E. Princeton Street	
Fourth Street - Calaveras Avenue to UC	

6.2.1.8 Railroad Involvement

No railroads within the vicinity of the project area will be impacted by the project. Therefore, there will not be any anticipated railroad involvement.

6.2.1.9 Right of Way Impacts

For the interchange related improvements, the following property rights required partial right of way impacts to six single family homes and 11 commercial parcels. Full right of way impacts will result for one vacant land, ten single family homes and eight commercial parcels. Impacted land will be purchased by the City of Ontario, the implementing agency, and ownership of land purchased for the interchange improvement will be turned over to Caltrans. A right of entry

permit will need to be obtained from the City of Ontario in order to work in their right of way during construction.

For the local improvements, the following property rights required consist of partial right of way impacts to four vacant land parcel, 21 single family homes, and 22 commercial parcels. Full right of way impacts will result for 29 single family homes and three commercial parcels. Impacted land will be purchased by the City of Ontario, the implementing agency, and is to remain as city property to be used for the local improvements. Right of way data sheets for local public agencies are provided in Attachment 9 of this report.

6.2.1.10 Cost Estimate Summary

Details of the following construction costs are provided in section 6.3 and Attachment 10 of this PSR for alternative 1.

Roadway Items	$49 million
Structure Items	$30 million
Right-of-way (R/W) Items	$51 million
Total Capital Construction and R/W Costs	**$130 million**

6.2.1.11 Non-Motorized Facilities

Along Fourth Street and Grove Avenue, the existing 5-foot sidewalk will be removed and upgraded to 6.5 feet within the proposed construction limits, except for between the beginning and end of bridge of the undercrossing where it will transition to 5-foot sidewalks. All existing curb ramps within the project area will be upgraded to comply with ADA standards.

Currently, there are no existing bicycle lanes or routes along either Fourth Street or Grove Avenue. The Ontario Bicycle Plan does not consider either Fourth Street or Grove Avenue as a bikeway facility. Further study during the PA/ED phase, will determine if a bike facility on Fourth Street or Grove Avenue should be added to the Bicycle Plan.

6.2.2 Alternative 2: Diamond Alternative

Alternative 2 proposes the following modifications of the existing interchange (also see Attachment 7):

- Addition of direct westbound on-ramp from Grove Avenue.
- Addition of direct westbound off-ramp to Grove Avenue.
- Addition of direct eastbound off-ramp to Grove Avenue.
- Addition of direct eastbound on-ramp from Grove Avenue.
- Addition of auxiliary lane to westbound I-10 freeway from 550 feet West of Fourth Street to 700 feet East of Fourth Street.

- Removal of Fourth Street diamond interchange and related construction activity.
- Widening of Grove Avenue from 1,180 feet north of I-10/Westbound Ramps Intersection to Holt Boulevard.
- Widening of Fourth Street from Virginia Avenue to 170 feet east of North Baker Avenue.

I-10

The current eight-lane freeway segment from post mile 4.1 through 6.1 ("A" line, as shown in Attachment 7) has a HOV lane in each direction. Meaning, the freeway consists of four mixed flow lanes and one HOV lane in each direction. The westbound direction will be widened for the addition of an auxiliary lane from 550 feet West of Fourth Street to 700 feet East of Fourth Street for added deceleration length in advance of the westbound off-ramp at Grove Avenue. The mainline widening will be a mere offset of 12 feet from the existing outside edge of traveled way with a proposed 4:1 side slope to stay within Caltrans right-of-way.

Fourth Street

The existing Fourth Street ("BE" line) undercrossing (UC) (Bridge No. 54-440) will be widened to accommodate three through lanes in each direction (see Attachment 7 cross section). The same cross section transitions will occur for this alternative as described for alternative 1. The existing interchange at Fourth Street will be removed by this alternative and a new interchange will be constructed at Grove Avenue.

Grove Avenue

The existing Grove Avenue ("GE" line) will conform to existing at Virginia Avenue and be widened to accommodate three through lanes in each direction, dual southbound left turn lanes, and a single left turn lane at the undercrossing (see Attachment 7 cross section). The same cross section transitions will occur for this alternative as described for alternative 1.

Grove Avenue Westbound On-Ramp

This proposed on-ramp ("G1" line) will have a 50:1 convergence point that will conform to I-10 edge of shoulder near station 239+13 and also begin to remove and replace a soundwall on type 1 retaining wall. At station 5+13 the single lane on-ramp will conform to the I-10 and transition to two lanes at station 11+62 where a ramp meter will be installed for a single lane only with non-metered HOV lane access. Due to the elevation difference of the ramp and original ground the proposed soundwall on retaining wall will continue until station 14+00 and connect to a metal beam guard rail. The existing soundwall on retaining will be removed up to station 254+00 to provide continual noise abatement for the area. At station 14+00, the on-ramp will continue to the terminus as two lanes to accommodate the dual left-turn movement from northbound Grove Avenue while provide 4:1 side slope on both sides of the ramp.

Grove Avenue Westbound Off-Ramp
The proposed off-ramp ("G2" line) will conform to Grove Avenue with one left turn, one shared left-through, and one right turn lane at the terminus. The horizontal offset from the existing I-10 edge of shoulder will create a valley between the mainline and ramp. As the ramp approaches the finished grade elevation of the mainline, at station 15+00, a type 1 retaining wall will constructed at the edge of shoulder. The proposed retaining wall will replace an existing retaining wall on the mainline edge of shoulder from station 265+00 to 270+00. The proposed retaining wall will transition to a soundwall on type 1 retaining wall at 18+00 and continue to the end of the ramp at station 21+39 where the I-10 auxiliary lane will begin.

Grove Avenue Eastbound Off-Ramp
The new off-ramp ("G4" line) will conform to I-10 edge of shoulder at station 243+70 and remove and replace existing metal beam guard rail. This off-ramp will conform to I-10 at station 4+13 as a single lane off-ramp. At station 5+00, the metal beam guard rail will end and a soundwall on type 1 retaining will begin. The proposed soundwall on retaining wall will replace the entire existing soundwall located in that quadrant. The soundwall on retaining wall will end at station 13+00 where the on-ramp will hold a 4:1 side slope until it connects to Grove Avenue. At the terminus with Grove Avenue, the on-ramp will consist of one left turn, one through-right, and one right turn lane.

Grove Avenue Eastbound On-Ramp
The proposed on-ramp ("G6" line) will provide enough lanes for the dual left turn movement from southbound Grove Avenue onto the ramp. As the on-ramp approaches mainline station 262+50, the type 1 retaining wall will be removed from the I-10 edge of the shoulder and shifted to the right edge of shoulder at 12+50. A ramp meter will be installed for a single lane only with non-metered HOV lane at station 13+77. The proposed type 1 retaining wall will continue pass the ramp connection point to I-10 at station 20+36 until the 50:1 convergence point ties into the existing retaining wall at station 273+00.

6.2.2.1 Freeway Operations

Under Project Alternative 2 for the 2017 opening year, all study freeway segments would operate at LOS E or F during one or both peak hours; similar to the No-Build conditions. Table 19 in the Attachment 5 of this report summarizes the 2017 traffic operations for the study freeway mainline for Alternative 2. For the weaving analysis, the westbound and eastbound I-10 weaving segment between Vineyard Avenue and Archibald Ave is projected to operate at LOS E or F during one of the AM and PM peak hours, as Table 24 of Attachment 5 indicates. This segment is also projected to operate at an unsatisfactory level of service under No-Build conditions; this deficiency is not caused by or aggravated by the proposed project.

Under Project Alternative 2 for the 2040 design year, all the study freeway segments would operate at LOS F during both peak hours; similar to the No-Build conditions. Table 34 in Attachment 5 summarizes the traffic operations for the study freeway mainline. Additionally, both I-10 weaving segments between Vineyard Avenue and Archibald Ave are projected to

operate at an unsatisfactory level of service during the AM and PM peak hour as shown in Table 36 of Attachment 5. These segments are also projected to operate at unsatisfactory levels of service under 2040 No-Build conditions; these deficiencies are not caused by or aggravated by the proposed project.

6.2.2.1.1 Ramp Queuing Analysis

Year 2017 Alternative 2 AM and PM peak hour levels of service for the freeway ramp influence areas are summarized in Table 21. Four out of the 13 ramps studied experience improved LOS in the PM peak hour. The ramp merge/diverge areas identified in Table 21 are projected to operate at unsatisfactory levels of service because the freeway mainline will be over capacity. These conditions are not caused or aggravated by the proposed project. The four ramps with improved peak hour PM. LOS include the following:

- Euclid Ave Off-Ramp (from LOS F to E)
- Euclid Ave On-Ramp (from LOS F to D)
- Grove Ave Off-Ramp (from LOS F to E)
- Euclid Ave Loop On-Ramp (from LOS F to C)

Year 2040 Alternative 2 AM and PM peak hour levels of service for the freeway ramp influence areas are identical to No-Build conditions summarized in Table 35. The ramp merge/diverge areas are projected to operate at unsatisfactory levels of service because the freeway mainline will be over capacity. These conditions are not caused or aggravated by the proposed project.

6.2.2.2 Intersection Operations

Level of Service Analysis

For opening year 2017, Table 12 in Attachment 5 shows the level of service, delay and volume-to-capacity ratio for the study intersections. Project Alternative 2 would improve one of the four intersections that would operate at LOS E or F under No-Build conditions to an acceptable LOS D or better, resulting in a total of 20 out of 23 study intersections that would operate at an acceptable LOS. The intersection is as follows:

- Grove Avenue/Holt Boulevard (from LOS E to C in the PM only)

Overall, Alternative 2 would improve the peak hour traffic operations at 20 out of 23 study intersections with less delay and/or better LOS compared to No-Build conditions, during one or both peak hours. One of the 23 study intersections would expect a higher delay during both peak hours under Alternative 2, compared to No-Build conditions. Two of the study intersections would degrade in LOS for only during the AM peak hour.

For design year 2040, Table 27 in Attachment 5 shows the LOS, delay and volume-to-capacity ratios for the study intersections for this alternative (see the Traffic Study for technical

calculations). Project Alternative 2 would improve two of the 10 intersections that would operate at LOS E or F under No-Build conditions to an acceptable LOS D or better, resulting in a total of 13 out of 23 study intersections that would operate at an acceptable LOS. The two intersections are:

- Grove Avenue/Fourth Street
- Vineyard Avenue/Fourth Street

Overall, Alternative 2 would improve the peak hour traffic operations at 17 out of 23 study intersections with less delay and/or better LOS compared to No-Build conditions, during one or both peak hours. Four of the 23 study intersections would expect a higher delay during both peak hours under Alternative 2, compared to No-Build conditions. None of the study intersections would degrade in LOS.

Queue Analysis

Under Project Alternative 2 for the 2017 opening year, all of the storage lanes have sufficient space provided to accommodate the vehicle queue during the AM and PM peak hours, as seen in Table 16 of Attachment 5. Additionally, Alternative 2 would reduce the change in length for the 95th percentile queue at the Fourth Street/Grove Avenue southbound left and through lanes from the No-Build Alternative.
Under Project Alternative 2 for the 2040 interim year, the southbound right-turn lane on Grove Avenue at Fourth Street is forecast to have inadequate queuing space during the PM peak hour, as seen in Table 31 of Attachment 5. Additionally, the queue length of the southbound through lanes on Grove Avenue at Fourth Street is forecast to be longer than the adjacent left-turn and right-turn pocket storage lengths during the AM and PM peak hours, resulting in potential blockage of the turn pockets.

6.2.2.3 Design Exceptions

Tables 7 through 9 below summarize the five proposed nonstandard advisory design exception features for Project Alternative 2. Not shown are the five existing mandatory design exceptions to remain along the I-10 freeway. For the six mandatory design exceptions see Table 2 in Section 6.2.1.3 of this report.

Table 7: Grove Street Westbound On-Ramp - "G1" Line

Exception	Index	Description	Standard	Proposed
Advisory	204.4	Vertical Curve Length	200'	130'
Advisory	504.2 (5)	Cross Slope in Gore Area	$x \leq 5\%$	$5\% \leq x \leq 15\%$

Table 8: Grove Street Eastbound Off-Ramp - "G4" Line

Exception	Index	Description	Standard	Proposed
Advisory	504.3 (3)	Location & Design of Ramp Intersection	500'	483.8'

Table 9: Grove Street Eastbound On-Ramp - "G6" Line				
Exception	Index	Description	Standard	Proposed
Advisory	204.4	Vertical Curve Length	200'	100'
Advisory	504.2 (5)	Cross Slope in Gore Area	$x \leq 5\%$	$5\% \leq x \leq 15\%$

6.2.2.4 Storm Water Data Report

The project is located in an urbanized area of the Cucamonga Creek watershed and within the Chino (split) Hydrologic Sub-Area (HSA) 801.21. The segment of the Cucamonga Creek that will be affected is the Valley Reach and is included in the current impaired water body 303(d) list. There is no Target Design Constituent (TDC) for this project as the nearest 303(d) listed receiving water body is more than four miles downstream of the site.

Since there are no TDCs, this project will consider some treatment best management practices (BMPs) for general purpose pollutant removal. The storm water runoff will be treated before it drains into the Cucamonga Creek. Additionally, no existing treatment BMPs were discovered within the project limits or associated with this project.

During construction, temporary BMPs will be implemented and maintained by the contractor over the estimated two-year construction period. This will ensure slope stabilization and sediment control; minimize tracking; prevent wind erosion; and address construction site management–related pollutants from being introduced into the storm water runoff.

All construction activities within Caltrans' right-of-way must conform to the Department's Statewide NPDES storm water permit, Order No. 99-06-DWQ, NPDES No. CAS 000003 in addition to the responsibilities specified in the Department's Statewide Storm Water Management Plan (SWMP). The project must also conform to the requirements for the General NPDES Permit for Construction activities, Order No. 2009-0009-DWQ, NPDES No. CAS 000002, and subsequent permit General Permit in effect at the time of project activity.

6.2.2.5 Transportation Management Plan

The TMP for this project will provide options for minimizing potential construction impacts and traffic disruptions, and ensure the safety of workers and public in the construction area. A TMP will be prepared during the PS&E stage; a data sheet has been provided in Attachment 14 of this report. The report will include one or all of the following elements:

- Public awareness campaign
- Traffic system and signing package
- Incident and demand management
- Construction and alternative route strategies

- Advanced transportation management system (ATMS)

6.2.2.5.1 Staging

Construction of the project will be staged to minimize traffic through and around the project site. Fourth Street UC and Grove Avenue UC will be constructed in two main stages as shown in the Advanced Planning Study. These activities are also identified in the overall staging in Stages 2 and 3 below. All stakeholders have agreed in the PDT meetings that it is acceptable to reduce the I-10 lanes from five in each direction to four in each direction within the project limits during these construction stages. The HOV lanes will be merged into the adjacent Mixed Flow lane to achieve this reduction in number of lanes. To maintain all five lanes in each direction may require bridge construction in 3 stages and either construction of bridges wider than otherwise needed or construction of temporary bridges. These choices may have additional impacts on right of way, utilities, geometrics, or vertical clearance over local streets and will be an additional construction time and cost to the project.

Given the additional throw-away costs and potential impacts, the project stakeholders conceptually agreed to reduction of freeway lanes during construction for the PSR level studies. However, this issue must be addressed in more detail during the PA/ED phase and final concurrence obtained from Caltrans and FHWA. Generally, the interchange improvement staging will consist of five phases:

Stage 1 Construction

Stage 1 construction activities will consist of constructing the Grove Avenue corridor widening into phases to reduce impact to traffic; Fourth Street widening (without impacting the existing ramps); and shifting of I-10 existing median concrete barrier back to freeway centerline at the Fourth Street Interchange location.

Stage 2 Construction

Stage 2 construction activities will consist of demolishing the existing Grove Avenue and Fourth Street UC I-beam structures in both directions; replacement and widening of demolished Grove Avenue and Fourth Street UC structures; and construction of eastbound and westbound proposed ramp connections at Grove Avenue.

Stage 3 Construction

Stage 3 construction activities will consist of demolishing the remaining existing Grove Avenue and Fourth Street UC structures in both directions; replacement and widening of the demolished Grove Avenue and Fourth Street UC structures; and construction of the eastbound and westbound Grove Avenue ramps (without impacting existing ramps).

Stage 4 Construction

Stage 4 construction activities will consist of connecting the outer and center structure portions of the proposed Grove Avenue and Fourth Street UCs; demolition of existing Fourth Street westbound on-ramp and eastbound off-ramp; and construction of remaining Grove Avenue westbound off-ramp and eastbound on-ramp.

Stage 5 Construction
Stage 5 construction activities will consist of demolishing the remaining existing Fourth Street ramp; and construction of the I-10 westbound auxiliary lane.

6.2.2.6 Structures Advance Planning Study

An APS report has been prepared for the project structures. All three alternatives require the existing bridge structures be removed and replaced with longer and shallower structures. The three alternatives will widen Fourth Street and Grove Avenue to different widths (as shown in Attachment 7 cross sections of this report), but result in a two span continuous concrete bridge at both interchanges in order to reduce the required structure depth, with a center bent and tall cantilever type abutments. An overview of the key findings from the APS is shown in section 6.2.1.6 of this report for existing and proposed structure will be the same for all three alternatives. A general plan for each structure is included in Attachment 8. The replacement bridge will meet the 15 feet minimum vertical clearance and the minimum of 2% cross slope requirements.

6.2.2.7 Utility Involvement

A utility agreement and a notice to Owner will be required for this project. A utility information request has been sent to all utility owners within the project limits. As a result of this coordination and field review, only the utility facilities expected to be involved during construction are identified below. The facilities shown will all require relocation expenses separate from the other utility impacts covered in the roadway items of the preliminary project total cost estimate in Attachment 10 of this report.

Involvement due to interchange improvements:

Southern California Gas Company	
Location	Utility Type
Fourth Street UC	6" Low Risk Gas Line
Grove Avenue UC	6" Low Risk Gas Line

Time Warner	
Location	Utility Type
Grove Avenue - 1,180 feet N. of WB Ramps to 1,000 feet S. of E. Princeton Street	Overhead Fiber Optic Cable Lines

Verizon	
Location	Utility Type
Grove Avenue - 1,180 feet N. of WB Ramps to 1,000 feet S. of E. Princeton Street	Overhead Fiber Optic Telephone Lines

Southern California Edison	
Location	Utility Type
Grove Avenue - 1,180 feet N. of WB Ramps to 1,000 feet S. of E. Princeton Street	Overhead Electrical Lines

Involvement due to local improvements:

Verizon	
Location	Utility Type
Grove Avenue - 1,000 feet S. of E. Princeton Street to Fourth Street Intersection, E. I Street to E. G Street, and E. D Street to E. Holt Boulevard	Overhead Fiber Optic Telephone Lines
Fourth Street - 500 feet W. of Grove Avenue to UC	

Time Warner	
Location	Utility Type
Grove Avenue - 1,000 feet S. of E. Princeton Street to Fourth Street Intersection	Overhead Fiber Optic Cable Lines
Fourth Street - 500 feet W. of Grove Avenue to UC	

Southern California Edison	
Location	Utility Type
Grove Avenue - 1,000 feet S. of E. Princeton Street to Fourth Street Intersection, E. I Street to E. G Street, and E. D Street to E. Holt Boulevard	Overhead Electrical Lines
Fourth Street - 500 feet W. of Grove Avenue to UC	

6.2.2.8 Railroad Involvement

No railroads within the vicinity of the project area will be impacted by the project. Therefore, there will not be any anticipated railroad involvement. However, should an impact develop throughout the course of the project, the respective transit agency will be involved.

6.2.2.9 Right of Way Impacts

For the interchange related improvements, the following property rights required consist of partial right of way impacts to one vacant land parcel, 21 single family homes, ten multifamily homes, and 17 commercial parcels. Full right of way impacts will result for the nine single family homes, two multifamily homes and six commercial parcels. Impacted land will be purchased by the City of Ontario, the implementing agency, and ownership of land purchased for the interchange improvement will be turned over to Caltrans. A right of entry permit will need to be obtained from the City of Ontario in order to work in their right of way during construction.

For the local improvements, the following property rights required consist of three vacant land parcels, 23 single family homes and 14 commercial parcels. Full right of way impacts will result for 28 single family homes and two commercial parcels. Impacted land will be purchased by the City of Ontario, the implementing agency, and is to remain as city property to be used for the local improvements. Right of way data sheets for local public agencies are provided in Attachment 9 of this report.

6.2.2.10 Cost Estimate Summary

Details of the following construction costs are provided in section 6.3 and Attachment 10 of this PSR for alternative 2.

Roadway Items	$69 million
Structure Items	$28 million
Right-of-way (R/W) Items	$59 million
Total Capital Construction and R/W Costs	**$156 million**

6.2.2.11 Non-Motorized Facilities

Along Fourth Street and Grove Avenue, the existing 5-foot sidewalk will be removed and upgraded to 6.5 feet within the proposed construction limits, except for between the beginning and end of bridge of the undercrossing where it will transition to 5-foot sidewalks. All existing curb ramps within the project area will be upgraded to comply with ADA standards.

Currently, there are no existing bicycle lanes or routes along either Fourth Street or Grove Avenue. The Ontario Bicycle Plan does not consider either Fourth Street or Grove Avenue as a bikeway facility. Further study during the PA/ED phase, will determine if a bike facility on Fourth Street or Grove Avenue should be added to the Bicycle Plan.

6.2.3 Alternative 3: Partial Cloverleaf Alternative

This alternative proposes removal of the existing Fourth Street interchange and addition of interchange configuration at I-10/Grove Avenue similar to those of alternative 2 (refer to Attachment 7), but with the following modifications:

- Addition of westbound loop on-ramp from Grove Avenue.
- Addition of eastbound loop on-ramp from Grove Avenue.

Grove Avenue
The existing Grove Avenue ("GE" line) will conform to existing at Virginia Avenue and be widened to accommodate three through and one right turn only lane in the northbound direction and two through and one through-right turn lane in the southbound direction at the undercrossing (see Attachment 7 cross section).

Grove Avenue Westbound Off-Ramp
The proposed off-ramp ("G2" line) will shift the local street connection north from I-10 freeway to accommodate the westbound loop on-ramp at the ramp terminus and result in additional advisory design exceptions not associated with alternative 2 as shown in section 6.2.3.3. The remainder of the off-ramp will result as shown for alternative 2 in section 6.2.2.

Grove Avenue Westbound Loop On-Ramp
The proposed loop on-ramp ("G3" line) will conform to I-10 at station 2+56 as a single lane ramp. At station 3+50 the remainder of the existing soundwall on retaining wall will be removed

and replaced along the proposed left edge of shoulder. After the Grove Avenue UC, the existing retaining wall along the I-10 edge of shoulder will be removed and replaced on the ramp left edge of shoulder until station 10+00. At the same quadrant, the existing retaining wall will be removed until station 260+00.

Grove Avenue Eastbound Off-Ramp
The new off-ramp ("G4" line) will conform to I-10 and diverge from the freeway in a similar fashion as shown in alternative 2. This off-ramp alignment will shift the local street connection south from I-10 freeway to accommodate the eastbound loop on-ramp at the ramp terminus and result in additional advisory design exceptions not associated with alternative 2 as shown in section 6.2.3.3.

Grove Avenue Eastbound Loop On-Ramp
The proposed loop on-ramp ("G5" line) will be a single lane on-ramp. At station 11+25, a type 1 retaining wall will begin on the left edge of traveled to support the elevation difference between the loop on-ramp and off-ramp and end at station 13+00. As the loop on-ramp approaches the existing I-10 the edge of shoulder, a proposed retaining wall will replace the existing wall and move it to the right edge of shoulder. East of the UC, the remainder of the existing retaining wall will be removed and regarded to 4:1 slope due to regarding necessary for the eastbound direct on-ramp at that location.

6.2.3.1 Freeway Operations

Year 2017 Alternative 3 AM and PM peak hour levels of service for the study area freeway mainline and weaving segments are identical to 2017 Alternative 2 conditions summarized in Table 19 and 24 of Attachment 5 of this report.

Year 2040 Alternative 3 AM and PM peak hour levels of service for the study area freeway mainline and weaving segments are identical to Alternative 2 conditions summarized in Table 34 and 36 of Attachment 5 of this report. 2040 Alternative 3 weaving segments are identical to the 2040 No-Build Alternative.

These segments are also projected to operate at unsatisfactory levels of service under No-Build conditions; these deficiencies are not caused by or aggravated by the proposed project.

6.2.3.1.1 Ramp Operations

Year 2017 Alternative 2 AM and PM peak hour levels of service for the freeway ramp influence areas are summarized in Table 22. Five out of the 13 ramps studied experience improved LOS in the PM peak hour. The ramp merge/diverge areas identified in Table 22 are projected to operate at unsatisfactory levels of service because the freeway mainline will be over capacity. These conditions are not caused or aggravated by the proposed project. The five ramps with improved peak hour PM. LOS include the following:

- Euclid Ave Off-Ramp (from LOS F to E)
- Euclid Ave On-Ramp (from LOS F to D)
- Grove Ave Off-Ramp (from LOS F to E)
- Grove Ave Loop On-Ramp (from LOS F to D)
- Euclid Ave Loop On-Ramp (from LOS F to C)

Year 2040 Alternative 2 AM and PM peak hour levels of service for the freeway ramp influence areas are identical to No-Build conditions summarized in Table 35. The ramp merge/diverge areas are projected to operate at unsatisfactory levels of service because the freeway mainline will be over capacity. These conditions are not caused or aggravated by the proposed project.

6.2.3.2 Intersection Operations

Level of Service Analysis

Table 13 in Attachment 5 shows the level of service, delay and volume-to-capacity ratio for the study intersections under the opening year 2017. Project Alternative 3 would improve one of the four intersections that would operate at LOS E or F under No-Build conditions to an acceptable LOS D or better, resulting in a total of 20 out of 23 study intersections that would operate at an acceptable LOS under Alternative 3. The intersection is as follows:

- Grove Avenue/Holt Boulevard (from LOS E to C in the PM only)

For 2017 conditions, Project Alternative 3 would improve the peak hour traffic operations at 17 out of 23 study intersections with less delay and/or better LOS compared to No-Build conditions, during one or both peak hours. Six of the 23 study intersections would expect a higher delay during both peak hours under Alternative 3, compared to No-Build conditions. One of the study intersections would degrade in LOS for only during the AM peak hour.

Under the 2040 design year, Table 28 of Attachment 5 show that Project Alternative 3 would improve two of the 12 intersections that would operate at LOS E or F under No-Build conditions to an acceptable LOS D or better, resulting in a total of 13 out of 23 study intersections that would operate at LOS E or F better Alternative 3. The two intersections are:

- Grove Avenue/Fourth Street
- Vineyard Avenue/Fourth Street

Overall, Alternative 3 would improve the peak hour traffic operations at 17 out of 23 study intersections with less delay and/or better LOS compared to No-Build conditions during both peak hours. Only five study intersections would expect a higher delay during both peak hours under Alternative 3 compared to No-Build conditions. No studying intersection would degrade a LOS E or F.

Queuing Analysis

Under Project Alternative 3 for the 2017 interim year, all of the storage lanes have sufficient space provided to accommodate the vehicle queue during the AM and PM peak hours, as seen in Table 17 of Attachment 5. Additionally, Alternative 2 would reduce the change in length for the 95th percentile queue at the Fourth Street/Grove Avenue southbound left and through lanes from the No-Build Alternative.

Under Project Alternative 3 for the 2040 interim year, the following locations have the 95th percentile queue longer than the provided space as seen in Table 32 of Attachment 5:

- I-10 Westbound Ramps/Grove Ave – westbound right turn lane (PM only)
- I-10 Eastbound Ramps/Grove Ave – eastbound through/right turn lane (AM and PM)
- Fourth St/Grove Ave – southbound left turn lane (PM only)
- Fourth St/Grove Ave – southbound right turn lane (PM only)

Additionally, the queue length of the southbound through lanes on Grove Avenue at Fourth Street as well as the northbound through lanes on Grove Avenue at the I-10 Eastbound Ramps are forecast to be longer than the adjacent turn pocket storage lengths during the AM and/or PM peak hours, resulting in potential blockage of the turn pockets.

6.2.3.3 Design Exceptions

Tables 10 through 15 below summarize the 16 proposed nonstandard advisory design exception features for Project Alternative 3. Not shown are the five existing mandatory design exceptions to remain along the I-10 freeway. For the six mandatory design exceptions see Table 2 in Section 6.2.1.3 of this report.

Table 10: Grove Street Westbound On-Ramp - "G1" Line

Exception	Index	Description	Standard	Proposed
Advisory	203.5	Compound Curves	230.95'	229.30'
Advisory	204.4	Vertical Curve Length	200'	150'

Table 11: Grove Street Westbound Off-Ramp - "G2" Line

Exception	Index	Description	Standard	Proposed
Advisory	202.5 (1)	Superelevation Transition	160'	130'
Advisory	202.5 (1)	Superelevation Transition	300'	170'
Advisory	202.5 (2)	Superelevation Runoff	2/3 - 1/3	1/2 - 1/2

Table 12: Grove Street Westbound Loop On-Ramp - "G3" Line				
Exception	Index	Description	Standard	Proposed
Advisory	202.5 (1)	Superelevation Transition	420'	300'
Advisory	202.5 (2)	Superelevation Runoff	2/3 - 1/3	1/2 - 1/2
Advisory	504.3 (9)	Dist. b/w successive on-ramps	1000'	742'

Table 13: Grove Street Eastbound Off-Ramp - "G4" Line				
Exception	Index	Description	Standard	Proposed
Advisory	202.5 (2)	Superelevation Runoff	2/3 - 1/3	1/2 - 1/2
Advisory	202.5 (1)	Superelevation Transition	160'	130'
Advisory	202.5 (1)	Superelevation Transition	300'	170'
Advisory	504.3 (3)	Location & Design of Ramp Intersection	500'	473'

Table 14: Grove Street Eastbound Loop On-Ramp - "G5" Line				
Exception	Index	Description	Standard	Proposed
Advisory	202.5 (1)	Superelevation Transition	420'	300'
Advisory	202.5 (2)	Superelevation Runoff	2/3 - 1/3	1/2 - 1/2

Table 15: Grove Street Eastbound On-Ramp - "G6" Line				
Exception	Index	Description	Standard	Proposed
Advisory	203.5	Compound Curves	231.21'	229.62'
Advisory	204.4	Vertical Curve Length	200'	135'

6.2.3.4 Storm Water Data Report

The project is located in an urbanized area of the Cucamonga Creek watershed and within the Chino (split) Hydrologic Sub-Area (HSA) 801.21. The segment of the Cucamonga Creek that will be affected is the Valley Reach and is included in the current impaired water body 303(d) list. There is no Target Design Constituent (TDC) for this project as the nearest 303(d) listed receiving water body is more than four miles downstream of the site. Since there are no TDCs, this project will consider some treatment best management practices (BMPs) for general purpose pollutant removal. The storm water runoff will be treated before it drains into the Cucamonga Creek. Additionally, no existing treatment BMPs were discovered within the project limits or associated with this project.

During construction, temporary BMPs will be implemented and maintained by the contractor over the estimated two-year construction period. This will ensure slope stabilization and

sediment control; minimize tracking; prevent wind erosion; and address construction site management–related pollutants from being introduced into the storm water runoff.

All construction activities within Caltrans' right-of-way must conform to the Department's Statewide NPDES storm water permit, Order No. 99-06-DWQ, NPDES No. CAS 000003 in addition to the responsibilities specified in the Department's Statewide Storm Water Management Plan (SWMP). The project must also conform to the requirements for the General NPDES Permit for Construction activities, Order No. 2009-0009-DWQ, NPDES No. CAS 000002, and subsequent permit General Permit in effect at the time of project activity.

6.2.3.5 Transportation Management Plan

The TMP for this project will provide options for minimizing potential construction impacts and traffic disruptions, and ensure the safety of workers and public in the construction area. A TMP will be prepared during the PS&E stage; a data sheet has been provided in Attachment 14 of this report. The report will include one or all of the following elements:

- Public awareness campaign
- Traffic system and signing package
- Incident and demand management
- Construction and alternative route strategies
- Advanced transportation management system (ATMS)

6.2.3.5.1 Staging

Construction of the project will be staged to minimize traffic through and around the project site. Generally, the interchange improvement staging will consist of five phase. The construction activity occurring within the five phases of construction will be identical to alternative 2 shown in section 6.2.2.5.1 of this report. In addition, the remaining portion of the Grove Avenue eastbound loop on-ramp must occur in stage 4 in order to avoid impacting the existing Fourth street ramps.

6.2.3.6 Structures Advance Planning Study

An APS report has been prepared for the project structures. All three alternatives require the existing bridge structures be removed and replaced with longer and shallower structures. The three alternatives will widen Fourth Street and Grove Avenue to different widths (as shown in Attachment 7 of this report), but result in a two span continuous concrete bridge at both interchanges in order to reduce the required structure depth, with a center bent and tall cantilever type abutments. An overview of the key findings from the APS is shown in section 6.2.1.6 of this report for existing and proposed structure will be the same for all three alternatives. A general plan for each structure is included in Attachment 8. The replacement bridge will meet the 15 feet minimum vertical clearance and the minimum of 2% cross slope requirements.

6.2.3.7 Utility Involvement

A utility agreement and a notice to Owner will be required for this project. A utility information request has been sent to all utility owners within the project limits. As a result of this coordination and field review, only the utility facilities expected to be involved during construction are identified below. The facilities shown will all require relocation expenses separate from the other utility impacts covered in the roadway items of the preliminary project total cost estimate in Attachment 10 of this report.

Involvement due to interchange improvements:

Southern California Gas Company	
Location	Utility Type
Fourth Street UC	6" Low Risk Gas Line
Grove Avenue UC	6" Low Risk Gas Line

Time Warner	
Location	Utility Type
Grove Avenue - 1,180 feet N. of WB Ramps to 1,000 feet S. of E. Princeton Street	Overhead Fiber Optic Cable Lines

Verizon	
Location	Utility Type
Grove Avenue - 1,180 feet N. of WB Ramps to 1,000 feet S. of E. Princeton Street	Overhead Fiber Optic Telephone Lines

Southern California Edison	
Location	Utility Type
Grove Avenue - 1,180 feet N. of WB Ramps to 1,000 feet S. of E. Princeton Street	Overhead Electrical Lines

Involvement due to local improvements:

Verizon	
Location	Utility Type
Grove Avenue - 1,000 feet S. of E. Princeton Street to Fourth Street Intersection, E. I Street to E. G Street, and E. D Street to E. Holt Boulevard	Overhead Fiber Optic Telephone Lines
Fourth Street - 500 feet W. of Grove Avenue to UC	

Time Warner	
Location	Utility Type
Grove Avenue - 1,000 feet S. of E. Princeton Street to Fourth Street Intersection	Overhead Fiber Optic Cable Lines
Fourth Street - 500 feet W. of Grove Avenue to UC	

Southern California Edison	
Location	Utility Type
Grove Avenue - 1,000 feet S. of E. Princeton St. to Fourth St. Intersection, E. I St. to E. G St., and E. D St. to E. Holt Boulevard	Overhead Electrical Lines
Fourth Street - 500 feet W. of Grove Avenue to UC	

6.2.3.8 Railroad Involvement

No railroads within the vicinity of the project area will be impacted by the project. Therefore, there will not be any anticipated railroad involvement.

6.2.3.9 Right of Way Impacts

For the interchange related improvements, the following property rights required consist of partial right of way impacts to one vacant land parcel, 23 single family home units, ten multifamily units, and 13 commercial parcels. Full right of way impacts will result for the nine single family homes, two multifamily homes and seven commercial parcels. Impacted land will be purchased by the City of Ontario, the implementing agency, and ownership of land purchased for the interchange improvement will be turned over to Caltrans. A right of entry permit will need to be obtained from the City of Ontario in order to work in their right of way during construction.

For the local improvements, the following property rights required consist of partial right of way impacts to three vacant parcels, 26 single family homes and 18 commercial parcels. Full right of way impacts will result for 28 single family homes and one commercial parcels. Impacted land will be purchased by the City of Ontario, the implementing agency, and is to remain as city property to be used for the local improvements. Right of way data sheets for local public agencies are provided in Attachment 9 of this report.

6.2.3.10 Cost Estimate Summary

Details of the following construction costs are provided in section 6.3 and Attachment 10 of this PSR for alternative 3.

Roadway Items	$71 million
Structure Items	$27 million
Right-of-way (R/W) Items	$58 million
Total Capital Construction and R/W Costs	**$156 million**

6.2.3.11 Non-Motorized Facilities

Along Fourth Street and Grove Avenue, the existing 5-foot sidewalk will be removed and upgraded to 6.5 feet within the proposed construction limits, except for between the beginning and end of bridge of the undercrossing where it will transition to 5-foot sidewalks. All existing curb ramps within the project area will be upgraded to comply with ADA standards.

Currently, there are no existing bicycle lanes or routes along either Fourth Street or Grove Avenue. The Ontario Bicycle Plan does not consider either Fourth Street or Grove Avenue as a bikeway facility. Further study during the PA/ED phase, will determine if a bike facility on Fourth Street or Grove Avenue should be added to the Bicycle Plan.

6.3 Alternatives Comparison

Table 16: Alternatives Comparison

Project Impacts	Alternatives			
	No-Build	**1: Minimum Build**	**2: Diamond**	**3: Partial Cloverleaf**
1. Right of Way Parcels (Partial Take/Full Take)	--	(64/50)	(89/47)	(94/47)
2. Total Disturbed Soil Area (Acres)	--	6.2	21.9	29.5
• Impervious Area (Acres)	--	1.5	5.0	17.7
• Pervious Area (Acres)	--	4.7	16.9	11.8
3. Standard Vertical Clearance Met	No	Yes	Yes	Yes
4. Total Non Standard Features (Mandatory/Advisory)	(21/23)	(14/20)	(5/5)	(5/16)
• Existing Mandatory Design Exceptions to Remain	21	8	5	5
• Existing Advisory Design Exceptions to Remain	23	11	--	--
• Proposed Mandatory Design Exceptions	--	6	--	--
• Proposed Advisory Design Exceptions	--	9	5	16
5. No. of Key Turn Pockets where $Q_{Length(95th\ \%)}$>S_{Length}-AM(PM)/Total	11(8)/15	2(3)/13	1(2)/13	3(3)/13
6. Build Out 2040 Level of Service (EB Ramp/Grove) -AM(PM)	--	--	B(B)	A(B)
Build Out 2040 Level of Service (WB Ramp/Grove) -AM(PM)	--	--	B(B)	B(B)
Build Out 2040 Level of Service (EB Ramp/Fourth) -AM(PM)	F(F)	A(B)	--	--
Build Out 2040 Level of Service (WB Ramp/Fourth) -AM(PM)	C(F)	B(B)	--	--
7. Subtotal Capital Construction Costs for Interchange Improvements	--	**$102 million**	**$128 million**	**$128 million**
Roadway Cost	--	$32 million	$52 million	$54 million
Structural Cost	--	$30 million	$28 million	$27 million
Right of Way Cost	--	$40 million	$48 million	$47 million
8. Subtotal Capital Construction Costs for Local Improvements	--	**$28 million**	**$28 million**	**$28 million**
Roadway Cost	--	$17 million	$17 million	$17 million
Right of Way Cost	--	$11 million	$11 million	$11 million
9. Total Capital Construction and Right of Way Cost	--	**$130 million**	**$156 million**	**$156 million**

6.4 Withdrawn from Consideration

No alternatives have been withdrawn from consideration at this time.

6.5 Value Analysis

Value Analysis (VA) is a function-oriented systematic team approach, used to analyze and improve value in a product, facility design, system or service. It is a powerful methodology for solving problems and/or reducing costs while improving performance/quality requirements. The capital and support costs combined for each alternative are greater than $25 million. A VA study for this project will be required during the PA/ED phase of this project.

7.0 COMMUNITY INVOLVEMENT

Currently this project is in the Project Initiation Document (PID) phase and is yet to be presented to the general public for comment. Purpose and Need statements were developed through a series of PDT meetings occurring since May 2007. In these meetings various stakeholders including, but not limited to, Caltrans and its various divisions, SANBAG, City of Rancho Cucamonga, and City of Upland provided input on the challenges and opportunities the existing interchange presents. These challenges and opportunities were then turned into the alternative solutions illustrated earlier for consensus, feedback and pertinent modifications before arriving at their current configuration.

As part of the public outreach effort, notices will be sent to the surrounding neighborhoods, government agencies, and public officials, informing them of the proposed project. A community meeting will occur during the PA/ED phase prior to selecting a preferred alternative. A newspaper announcement, mailers and a link on the City of Ontario website will be created to inform the general public and publicize an opportunity for a public hearing and feedback. By this time, a beautification team consisting of the consultants and Caltrans Landscape Architecture unit would be able to identify if the structural treatments and landscaping satisfy the theme requirements for the corridor or will be acceptable using standard available designs. After full public disclosure has been achieved on all matters, a preferred alternative will be selected and refined.

8.0 ENVIRONMENTAL DETERMINATION/DOCUMENT

8.1 Anticipated Environmental Approval

CEQA

☐ Categorical/Statutory Exemption
☐ Negative Declaration / focused ND
☒ Initial Study

NEPA

☐ Categorical Exclusion
☐ Finding of No Significant Impact
☒ Environmental Assessment

8.2 Project Study Report (PSR) Summary Statement

It is expected that the Environmental Document (ED) for the project will be an Environmental Assessment (EA) for National Environmental Policy Act (NEPA) compliance and an Initial Study (IS) for California Environmental Quality Act (CEQA) compliance, culminating in preparation of a Mitigated Negative Declaration/Finding of No Significant Impact. Based on the Preliminary Environmental Analysis Report (PEAR) (May 2010), all build alternatives have the potential for adverse environmental impacts related to Section 4(f), water quality and erosion, air quality, noise, cultural resources, paleontological resources, hazardous materials, and biological resources. Impacts to other environmental resources may become apparent through more detailed environmental analysis. For a signed copy of the PEAR, see Attachment 13 of this report. The IS/EA is anticipated to be completed within 18 to 30 months of initiation. The IS/EA would be prepared subsequent to completion of the requisite technical studies, and the completion of the document availability period. The IS/EA is currently scheduled to be distributed for public review by 2011. If the IS/EA reveals that immitigable impacts will occur an Environmental Impact Report/Environmental Impact Study (EIR/EIS) will be required. Caltrans District 8 will be the lead agency for CEQA and NEPA approval.

8.3 Special Considerations/Required Agency Permits

Under any of the project alternatives there is the potential for direct impacts on parks (John Galvin Park, Grove Memorial Park, and Veterans Memorial Park) and historic resources. These would be considered resources under Section 4(f) of the Department of Transportation Act. Any use of these resources, as defined under Section 4(f), would require that they be addressed in compliance with adopted regulations. In terms of the parks that are present, it is not anticipated that the proposed improvements would adversely affect the activities, features, and/or attributes of these 4(f) resources as they would result in sliver takes along the edge of an existing roadway and are not expected to encroach into any highly used areas within the parks. However, this would need to be coordinated, confirmed, and documented through coordination with the City's Parks Department, which has jurisdiction over these parks. If the Parks Department agrees, a *de minimus* finding with regard to Section 4(f) as it relates to publicly owned parks would likely be appropriate.

Furthermore, if any historic resources (or archaeological resources, if identified) within the area of potential effect (APE) are determined to be listed on or eligible for listing on the National Register of Historic Places, then these would also be considered resources under Section 4(f). In compliance with Section 106 of the National Historic Preservation Act, a Finding of Effect would need to be prepared to evaluate the effect of the proposed project on the eligible resource. If the proposed project results in a Finding of No Effect, then a *de minimus* finding would likely be appropriate with regard to Section 4(f).

Based on the alternative layouts presented it is anticipated that the proposed project would result in a *de minimus* impact on Section 4(f) resources; however, this will need to be further evaluated during the Project Approval/Environmental Document (PA/ED) phase of the proposed project.

If the use of or impact on these resources was not determined to be a *de minimus* impact, then this would require the preparation of a formal Section 4(f) evaluation. The need for a Section 4(f) evaluation could adversely affect the project schedule depending on the particulars related to the use of the identified resource.

Cultural resources that may be eligible for listing on the National Register of Historic Places are present in the immediate project area. If it is determined that impacts on these properties could occur, then a Finding of Effect under Section 106 would be required. Depending on the level of impact on the resource and the complexity of developing measures to address the impact, this documentation and evaluation could adversely affect the project schedule.

Colonial nesting swallows and several other native birds that lack special status but are protected by the federal Migratory Bird Treaty Act and similar provisions under California Department of Fish and Game (DFG) code, could nest underneath the I-10 undercrossing. Native birds, including non-special-status raptors, could nest in the mature non-native trees in the project area. To address potential impacts on roosting bats and nesting native birds, a single field visit to the project area should be conducted by a qualified biologist to determine the use of the project area by nesting birds and roosting bats. If no nesting native birds and/or roosting bats are found, no further action would be necessary. If nesting or roosting activities are identified, avoidance and/or minimization measures would be required. The discovery of nesting birds could affect the construction schedule depending on the nest location.

It is anticipated that the proposed project would require a Section 401 Water Quality Certification, Section 404 Permit, and Section 1602 Streambed Alteration Agreement. It is not anticipated that any special circumstances would be identified that would require any more than standard processing times for these permitting activities.

8.4 Anticipated Project Mitigation

8.4.1 Community Impacts

Property acquisition as part of the proposed project would be conducted in accordance with Caltrans and FHWA policies and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. Properties would be purchased at fair market value, and relocation assistance for displaced businesses and residents would be provided.

8.4.2 Hazardous Waste/Materials

An Initial Site Assessment (April 24, 2009) addressed the potential for hazardous waste in the project area. Related studies, such as analysis of aerially deposited lead in unpaved areas along the roadway, and analysis of structures and roadway targeted for demolition that could potentially contain lead-based paint and/or asbestos-containing materials may also be required. The use, transport, and disposal of hazardous and potentially hazardous materials used during construction would be conducted in accordance with applicable federal, state, and local

requirements. The following potential recognized environmental concerns directly related to the proposed project have been identified.

- Valero Service Station, 1155 North Grove Avenue, is located 1 block south of I-10 on the southwest corner of Grove Avenue and Princeton Street, and in the footprint of a proposed construction ramp for Alternative 1. This parcel contains underground storage tanks (USTs). It is assumed this parcel would need to be acquired and the USTs removed. If Alternative 1 is selected, Phase II soil sampling is recommended to investigate possible soil contamination on the site for the USTs and appurtenances. Review of the UST file for this site should be completed as part of the Phase II investigation.

- A vacant lot at 1305 4th Street, formerly a Chevron Station is located on the northeastern corner of Grove Avenue and 4th Street. This former UST site is not listed as a leaking underground storage tanks (LUST) case. However, the exact UST location and closure status is unknown. This site could affect the proposed Grove Avenue improvements. Review of the UST file for this site should be completed.

- A vacated service station at 1315 4th Street is located on the north side of 4th Street and adjacent to the east side of the vacant lot/former Chevron station described above. The site has USTs remaining in the ground, approximately 40 feet north of 4th Street. The LUST status is given as "soil only, pollution characterization." A site assessment performed in 2006, with no report provided. This site could affect improvements along Grove Avenue and 4th Street. Review of the UST file for this site should be completed as part of the Phase II investigation.

- Three additional service stations are located on 4th Street (Unocal 1425, 7/11 1544, and ARCO 1565) and within the project corridor. These sites have existing USTs, all with closed LUST cases. Detailed final design surveys for street improvements may encroach on the existing USTs, piping, and dispensers that are within 20 to 30 feet of existing street easements. This could result in an environmental impact if these UST facilities require relocation. Phase II file review and soil sampling would be recommended. These UST and dispenser locations in relation to street improvements should be taken into consideration during project design.

- Soils adjacent to paved areas in the project corridor may contain aerially deposited lead from vehicle exhaust. Areas within the project corridor where soil may be disturbed during construction should be tested for aerially deposited lead according to Caltrans testing guidelines.

- Potential lead-based paint was not observed. If the final construction alternative involves the acquisition of land with structures, the structures should be evaluated for suspect lead-based paint. Lead and other heavy metals such as chromium may be present in yellow

thermoplastic paint markings on the pavement. These surfacing materials should be tested for lead-based paint prior to removal.

- Asbestos-containing materials were not directly observed within the existing project right-of-way. If the project alternative involves the acquisition of land with structures or modification to the existing bridges, the structures or bridges should be evaluated for suspect asbestos-containing materials prior to demolition.

8.4.3 Noise

The proposed project alternatives would require removal and replacement of existing soundwalls in the project area. Determination of the need for and the placement of new sound walls would be made during the PA/ED phase of the project based on the Noise Study Report.

8.4.4 Biological Resources

To address potential impacts to roosting bats and nesting native birds a single field visit should be conducted within the project alignment by a qualified biologist to determine the existing use of the project area by nesting birds and roosting bats. If no nesting native birds and/or roosting bats are found, no further action would be necessary. If nesting/roosting activities are identified, avoidance and/or minimization measures would be required. The potential for the introduction or spread of invasive plant species is limited, as the project is occurring within a developed setting. Standard construction best management practices (BMPs) would be implemented during construction to limit the potential for the introduction or spread of invasive species. This will be further addressed in the Natural Environment Study (Minimal Impacts) (NES/MI) to be prepared in the PA/ED phase of the project.

Water permitting for this project is anticipated to include the following: (1) a Water Quality Certification under Clean Water Act (CWA) Section 401 through the Regional Water Quality Control Board, (2) a Nationwide Permit 14 or Individual Permit under CWA Section 404 through Army Corps of Engineers (ACOE), depending on the extent of impact to Waters of the U.S., and (3) a Streambed Alteration Agreement under California Department of Fish and Game (DFG) 1602 code through California DFG (CDFG).

8.4.5 Water Quality and Erosion

Best management practices (BMPs) would be implemented to minimize the erosion of exposed soils and resultant sediment and surface contaminant loading into the storm drain system and downstream water bodies. The project would require a Storm Water Pollution Prevention Plan (SWPPP) since the disturbed soil area would be more than one acre. It is anticipated that the proposed project would need to obtain an U.S. Army Corps 404 Permit/Regional Water Quality Control Board 401 Water Quality Certification. Coordination between the Project Engineer and the National Pollutant Discharge Elimination System (NPDES) unit would be needed to identify

potential sites for permanent treatment BMPs. This project is required to consider treatment BMPs identified in the Department's Statewide Storm Water Management Plan (SWMP).

All construction activities within Caltran's right-of-way must conform to the Department's Statewide NPDES storm water permit, Order No. 99-06-DWQ, NPDES No. CAS 000003 in addition to the responsibilities specified in the Department's Statewide SWMP. The project must also conform to the requirements for the General NPDES Permit for Construction activities, Order No. 2009-0009-DWQ, NPDES No. CAS 000002, and subsequent permit General Permit in effect at the time of project activity.

8.4.6 Air Quality

The proposed project would need to incorporate the control measures identified in the South Coast Air Quality Management District (SCAQMD) amended Rule 403 during construction to control fugitive dust.

8.4.7 Traffic

The proposed project is anticipated to result in improved traffic flow through the project corridor; however, changes in traffic patterns and flow could result in potential impacts to local arterials that could require mitigation. Potential street, lane, and ramp closures may result in adverse temporary impacts to traffic during construction. Implementation of a Traffic Management Plan (TMP) during construction would be required and would include measures to address construction period traffic impacts.

8.4.8 Cultural Resources

The proposed alternatives may afffect archaeological sites and historic resources. It is anticipated that a Historic Properties Survey Report (HPSR) and Archeological Survey Report (ASR), along with a Historic Resources Evaluation Report (HRER) will be required for the proposed project. A Finding of Effect (FOE) report would also be required if properties that are directly impacted include resources that are found eligible for the National Register of Historic Places.

8.4.9 Visual Resources

The proposed project will involve the construction of new structures and other activities that could result in a visual impact. Where feasible, treatments on the new interchange structures and walls, along with measures to address vegetation removal and impacts to sensitive viewer groups will need to be addressed.

8.4.10 Paleontology

A project level Paleontological Identification Report/ Paleontological Evaluation Report (PIR/PER) will be required. Based on the findings of the PIR/PER a Paleontological Mitigation

Plan (PMP) may also be required. Any measures arising from the PMP would need to be incorporated into the proposed project commitments.

8.4.11 Section 4(f)

Under any of the project alternatives there is the potential for direct impacts on parks (John Galvin Park, Grove Memorial Park, and Veterans Memorial Park) and historic resources. These would be considered resources under Section 4(f) of the Department of Transportation Act. Any use of these resources, as defined under Section 4(f), would require that they be addressed in compliance with adopted regulations. In terms of the parks that are present, it is not anticipated that the proposed improvements would adversely affect the activities, features, and/or attributes of these 4(f) resources as they would result in sliver takes along the edge of an existing roadway and are not expected to encroach into any highly used areas within the parks. However, this would need to be coordinated, confirmed, and documented through coordination with the City's Parks Department, which has jurisdiction over these parks. If the Parks Department agrees, a *de minimus* finding with regard to Section 4(f) as it relates to publicly owned parks would likely be appropriate. Furthermore, if any historic resources (or archaeological resources, if identified) within the area of potential effect (APE) are determined to be listed on or eligible for listing on the National Register of Historic Places, then these would also be considered resources under Section 4(f). In compliance with Section 106 of the National Historic Preservation Act, a Finding of Effect would need to be prepared to evaluate the effect of the proposed project on the eligible resource. If the proposed project results in a Finding of No Effect, then a *de minimus* finding would likely be appropriate with regard to Section 4(f). Based on the alternative layouts presented it is anticipated that the proposed project would result in a *de minimus* impact on Section 4(f) resources; however, this will need to be further evaluated during the Project Approval/Environmental Document (PA/ED) phase of the proposed project. If the use of or impact on these resources was not determined to be a *de minimus* impact, then this would require the preparation of a formal Section 4(f) evaluation.

8.5 Environmental Technical Reports or Studies Required

	Study	Document	N/A
Community Impacts	☒	☐	☐
Farmland/Timberlands	☐	☐	☒
Section 4(f) Evaluation	☒	☐	☐
Visual/ Aesthetics	☒	☐	☐
Water Quality and Stormwater Runoff	☒	☐	☐
Hydrology and Floodplain Evaluation	☒	☐	☐
Air Quality	☒	☐	☐
Noise and Vibration	☒	☐	☐
Wild and Scenic River Consistency	☐	☐	☒
Paleontology (PER, PMP)	☒	☐	☐
Cumulative Impacts/ CSS	☐	☒ x	☐

Land Use	☐	☐	☐
Growth	☐	☒	☐
Community Character and Cohesion	☐	☒	☐
Relocations	☒	☐	☐
Environmental Justice	☐	☒	☐
Utilities/Emergency Services	☐	☒	☐
Geology, Soils, Seismic and Topography	☐	☐	☒
Energy and Climate Change	☐	☒	☐

Cultural Resources			
ASR	☒	☐	☐
HRCR	☐	☐	☒
HRER	☒	☐	☐
HPSR	☒	☐	☐
Section 106 / PRC 5024 & 5024.5	☐	☒	☐
Native American Coordination	☐	☒	☐
Other	☐	☐	☒
Finding of Effect _____	☒	☐	☐
Data Recovery Plan _____	☐	☐	☒
Memorandum of Agreement	☐	☐	☒
Hazardous Waste			
ISA (Additional)	☒	☐	☐
PSI	☐	☐	☒
Other_____	☐	☐	☒
Biological			
Coastal Management Plan	☐	☐	☒
DFG Consistency Determination	☐	☐	☒
Species of Concern (CNPS, USFS, BLM, S, F)	☐	☐	☒
Biological Assessment (USFWS, MMFS)	☐	☐	☒
Wetlands & Other Waters/Delineation	☐	☒	☐
Invasive Species	☐	☒	☐
Natural Environment Study	☒	☐	☐
404(b) (1) Alternatives Analysis	☐	☐	☒
Other _____	☐	☐	☒
Section 7	☐	☐	☒
Formal	☐	☐	☒
Informal	☐	☐	☒
No effect	☐	☐	☒
Section 10	☐	☐	☒
HMMP	☐	☐	☒
2081	☐	☐	☒

Permits			
401 Permit Coordination	☒	☐	☐
404 Permit Coordination, IP, NWP, or LOP	☒	☐	☐
1602 Agreement Coordination	☒	☐	☐
City/County Coastal Permit Coordination	☐	☐	☒
State Coastal Permit Coordination	☐	☐	☒
NPDES Coordination	☒	☐	☐
US Coast Guard (Section 10)	☐	☐	☒
TRPA	☐	☐	☒
BCDC	☐	☐	☒

9.0 GEOTECHNICAL

The preliminary geotechnical report (PGR) outlines the existing physical setting, seismicity, subsurface soil and underground conditions, material sources, material disposal, and the conclusions and recommendations for supplemental geotechnical investigations. The report provides conclusions and recommendations with regard to: overexcavation and excavation criteria; fill placement; a discussion on soil expansion and erosion potential; and potential for liquefiable materials. In addition, criteria are provided for embankments and earth retaining structures to use for cost estimating and seismic and foundation recommendations for design purposes.

In addition, a full memorandum and corresponding exhibits are included in the preliminary materials memorandum to determine the R-values and pavement structural sections shown in Attachment 7 of this report using Log-of-Test-Borings (LOTB) that were drilled in 2008 within the project limits. Also, soil samples taken provide test results on soil corrosiveness and culvert material recommendations.

The recommendations provided in the reports are based on subsurface information contained on LOTB sheets of a nearby structure. An additional site-specific geotechnical investigation will be performed for this structure during the PS&E phase; therefore, the recommendations may change when additional site-specific information becomes available.

10.0 FUNDING

PA/ED expenses of this project are being locally funded by the City of Ontario who is the project sponsor. The City of Ontario has submitted their funding letter to Caltrans and has resulted in a cooperative agreement with Caltrans. The cooperative agreement includes funding and agreement arrangements, points of contact, required permits, indirect cost rate proposal, project delivery work plan, and support and capital costs. A copy of the executed cooperative agreement is included as an attachment to this report. Caltrans is the lead for the environmental process; otherwise will provide quality assurance from the planning through construction phase with project support funds set aside as shown in the project support components table below. In

addition, acquisition of an encroachment permit for construction will be required. The Right of Way Data Sheets will be reviewed and approved by Caltrans. The City of Ontario will act as the implementing agency for the Right of Way Data Sheets.

Fiscal Year	Right of Way Capital	Construction Capital
FY 09-10 - RTIP	$5,645,000	$0
FY 09-10 - Source 2	$0	$0
FY 10-13 - RTIP	$0	$0
FY 10-13 - Source 2	$0	$0
FY 13-14 - RTIP	$51,355,000	$99,000,000
FY 13-14 - Source 2	$0	$0
Total	$57,000,000	$99,000,000

	PROJECT SUPPORT COMPONENTS								
	PA&ED 0 Phase		Design 1 Phase		Right of Way 2 Phase		Construction 3 Phase		Total
	Dist	DES	Dist	DES	Dist	DES	Dist	DES	
Estimated PY's	1.67	0.35	4.17	0.35	0.6		13	0.35	20.49
Estimated PS $'s	300,000	60,000	750,000	60,000	108,000		2,340,000	60,000	$3,678,000
Estimated PYE $'s ($1000's)									0
Total $'s	300,000	60,000	750,000	60,000	108,000	0	2,340,000	60,000	3,678,000

11.0 SCHEDULE

A tentative schedule has been established, with the following milestones:

HQ Milestones	Delivery Date (Month, Day, Year)
Approve PID (PSR)	October 21, 2010
Begin PA&ED Phase	February 28, 2011
Notice of Intent (NOI)	May 1, 2011
Circulate DED	December 1, 2011
Approve PA/ED	February 1, 2013

12.0 FHWA COORDINATION

This Report has been reviewed by Tay Dam, FHWA Senior Transportation Engineer. Per SAFETEA-LU this project is eligible for federal-aid funding and is considered to be full-

oversight under current FHWA-Caltrans Stewardship Agreement. Tay Dam's comments have been incorporated into this report. FHWA's engineering and operational acceptability will be deferred to the PA/ED phase.

13.0 PROJECT CONTACTS

The following individuals may be contacted for information pertaining to this project:

Nassim Elias, PE	Caltrans PM	909-383-6713
Matthew Maestas, PE	Caltrans Pre-Engineering/Pre-Programming Studies	909-383-6463
Russell Williams	Caltrans Oversight Sr. in Environmental Division	909-383-6936
Gita Tokhmafshan	Caltrans Environmental Specialist	909-383-4283
Mauricio Diaz	City of Ontario – Project Manager	909-395-2107
Mario Montes, PE	AECOM – Project Manager	909-933-5225
Brian Balderrama, PE	AECOM – Project Engineer	213-330-7295

14.0 PROJECT REVIEWS

The following individuals have reviewed the draft submittal of this report and concur with the concept. This is the final submittal for all to review.

Nassim Elias	Caltrans, District 8 Project Manager
Albert Vergel de Dios	Caltrans, District 8 Pre-Engineering/Pre-Programming Studies
Gita Tokhmafshan	Caltrans, District 8 Environmental Planning
Kurt Heidelberg	Caltrans, District 8 Environmental Studies, "D"
Anthony Ng	Caltrans, District 8 FHWA Liason
Uwemeno Apabio Sr.	Caltrans, District 8 Operations/DTM/TMP
Luis Betancourt	Caltrans Headquarters Design Coordinator
Brian Frazer	Caltrans Headquarters Design Reviewer

15.0 ATTACHMENTS

Attachment 1: Regional Location Map

Attachment 2: Project Location Map

Attachment 3: Existing Lane Geometry

Attachment 4: Existing Condition Analysis

Attachment 5: Interim Year (2017) and Design Year (2040) Condition Analysis

Attachment 6: TASAS Table B

Attachment 7: Proposed Improvements

Attachment 8: Advance Planning Study

Attachment 9: Right of Way Data Sheets

Attachment 10: Cost Estimates

Attachment 11: Storm Water Data Report Approval

Attachment 12: Initial Site Assessment (ISA) Checklist

Attachment 13: PEAR Approval

Attachment 14: Transportation Management Plan Data Sheets

Attachment 15: Life Cycle Cost Analysis Forms

Attachment 16: Executed Cooperation Agreement

16.0 ACRONYMS

AASHTO = Association of State Highway and Transportation Officials

ACHP = Advisory Council on Historic Preservation

ACM = Asbestos-containing Material

ADL = Aerially-deposited Lead

ADT = Average Daily Traffic

APN= Access Point Name

APS= Advanced Planning Study

AQMP = Air Quality Management Plan

ASR= Archaeological Survey Report

ATMS= Advanced Transportation Management System

BLM = Bureau of Land Management

BMPs = Best Management Practices

CAA = Clean Air Act

Caltrans= California Department of Transportation

CARB = California Air Resources Board

CCTV= Closed Circuit Television

CDFG = California Department of Fish and Game

CEQA = California Environmental Quality Act

CIA = Community Impact Assessment

CNDDB = California Natural Diversity Database

CNPS = California Native Plant Society

CO = Carbon Monoxide

CSS = Context Sensitive Solutions

CWA = Clean Water Act

DFG = Department of Fish and Game

DIF = Developer Impact Fee

DL = Deceleration Length

DTSC = Department of Toxic Substances Control

E = Superelevation

EA= Environmental Assessment

ED = Environmental Document

ESA = Endangered Species Act

FHWA = Federal Highway Administration

FTA = Federal Transit Administration

HMA= Hot Mix Asphalt

HOV= High Occupancy Vehicle

HPSR= Historic Properties Survey Report

HRCR = Historic Resource Compliance Report

HRER = Historic Resource Evaluation Report

HSA= Hyrologic Sub-Area

IMD = Interstate Maintenance Discretionary

IS = Initial Study

ISA = Initial Site Assessment

IS/EA= Initial Study/Environmental Assessment

LACMTA = Los Angeles County Metropolitan Transportation Authority

LACMVP = Los Angeles County Vertebra Paleontology Department

LADOT = Los Angeles Department of Transportation

LADWP= Los Angeles Department of Public Works

LARFCC = Los Angeles River Flood Control Channel

LCP = Lead-containing Paint

LOTB= Log-of-Test-Borings

LOS= Level of Service

MBTA = Migratory Bird Treaty Act

Metro= Metropolitan Transportation Authority

MPO = Metropolitan Planning Organization

MSE= Mechanically Stabilized Embankment

MTBe = Methyl Tertiary Butyl Ether

NAAQS = National Ambient Air Quality Standards

NAC = Noise Abatement Criteria

NADR = Noise Abatement Decision Report

NAHC = Native American Heritage Commission

NEPA = National Environmental Policy Act

NO_2 - Nitrogen Dioxide

NPDES = National Pollution Discharge Elimination System

NPL = National Priorities List

O_3 - Ozone

PA/ED = Project Approval/Environmental Document

PCE = Perchloroethylene

PDT = Project Development Team

PEAR = Preliminary Environmental Analysis Report

PER = Paleontological Evaluation Report

PGR= Preliminary Geotechnical Report

PM = Particulate Matter, Post Mile

PMP = Paleontological Mitigation Plan

POC = Points of Concern

PR = Project Report

PRIMP = Paleontological Resources Impact Mitigation Program

PSI = Preliminary Sight Investigation (for Hazardous Waste Studies)

PS&E= Project, Specifications, and Estimate

PSR = Project Study Report

RCR = Route Concept Report

RTIP = Regional Transportation Improvement Program

RTP = Regional Transportation Plan

R/W = Right of Way

RWQCB = Regional Water Quality Control Board

SANBAG = San Bernardino Associated Governments

SB = Southbound

SCAB = South Coast Air Basin

SCAG = Southern California Association of Governments

SCAQMD = South Coast Air Quality Management District

SHPO = State Historic Preservation Officer

SIP = State Implementation Plan

SPGR = Structures Preliminary Geotechnical Reports

SPUI = Single Point Urban Interchange

SR = State Route

SSC = Species of Special Concern

STIP = State Transportation Improvement Plan

SWMP = Storm Water Management Plan

SWRCB = State Water Resources Control Board

SWPPP = Storm Water Pollution Prevention Plans

TASAS = Traffic Accident Surveillance and Analysis System

TCE = Trichloroethylene

TDC = Target Design Pollutants

TeNS = Technical Noise Supplement

TMDLs = Total Maximum Daily Loads

TMP = Transportation Management Plan

TNAP = Traffic Noise Analysis Protocol

TPH = Total Petroleum Hydrocarbons

TSN = Transportation Systems Network

UC = Undercrossing

UT = Universal Terrace

US = United States, United State Route

USDOT = U.S. Department of Transportation

USEPA = U.S. Environmental Protection Agency

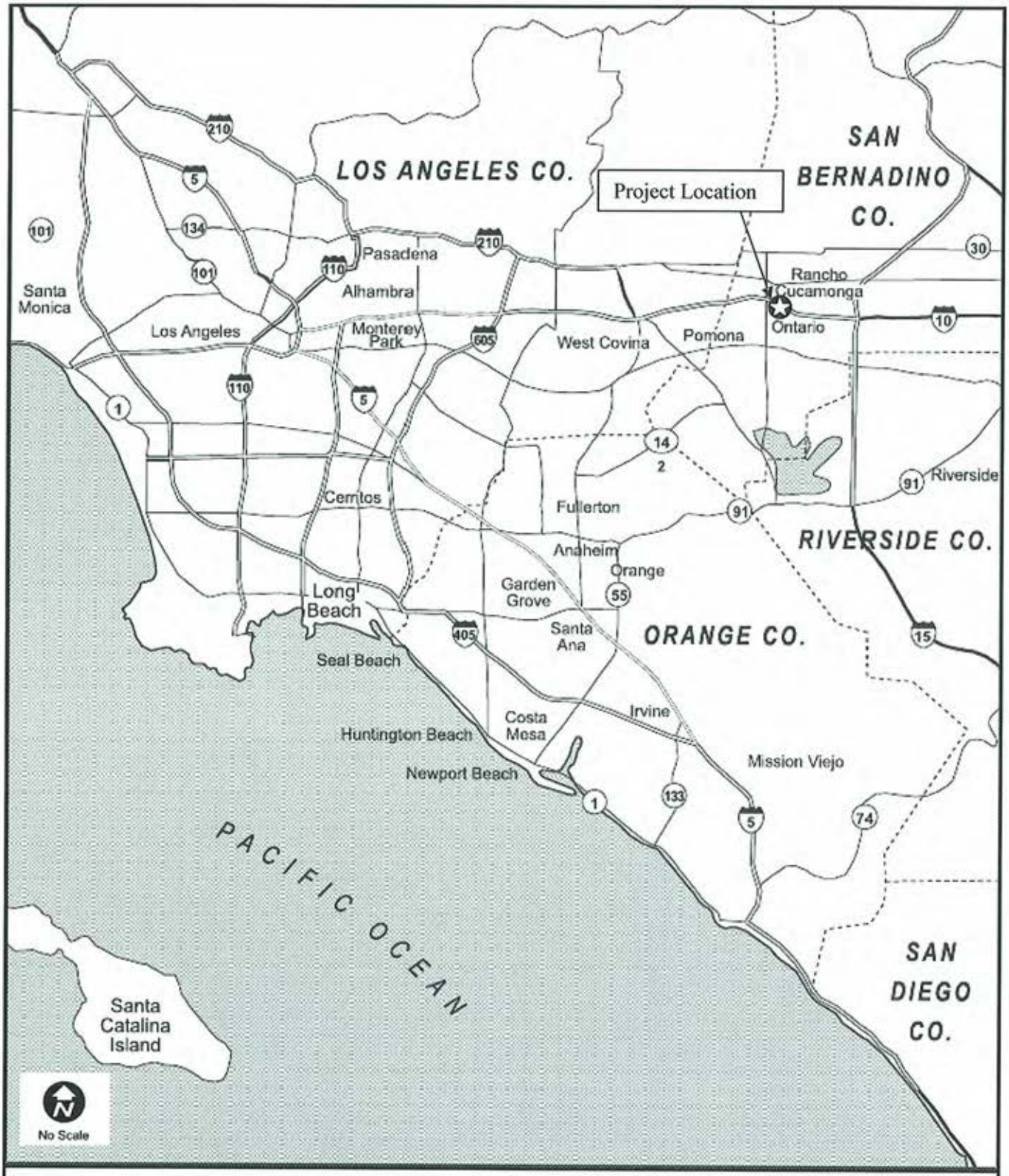
USFS = U.S. Forest Service

USFWS = U.S. Fish and Wildlife Service

VA = Value Analysis

ATTACHMENT 1

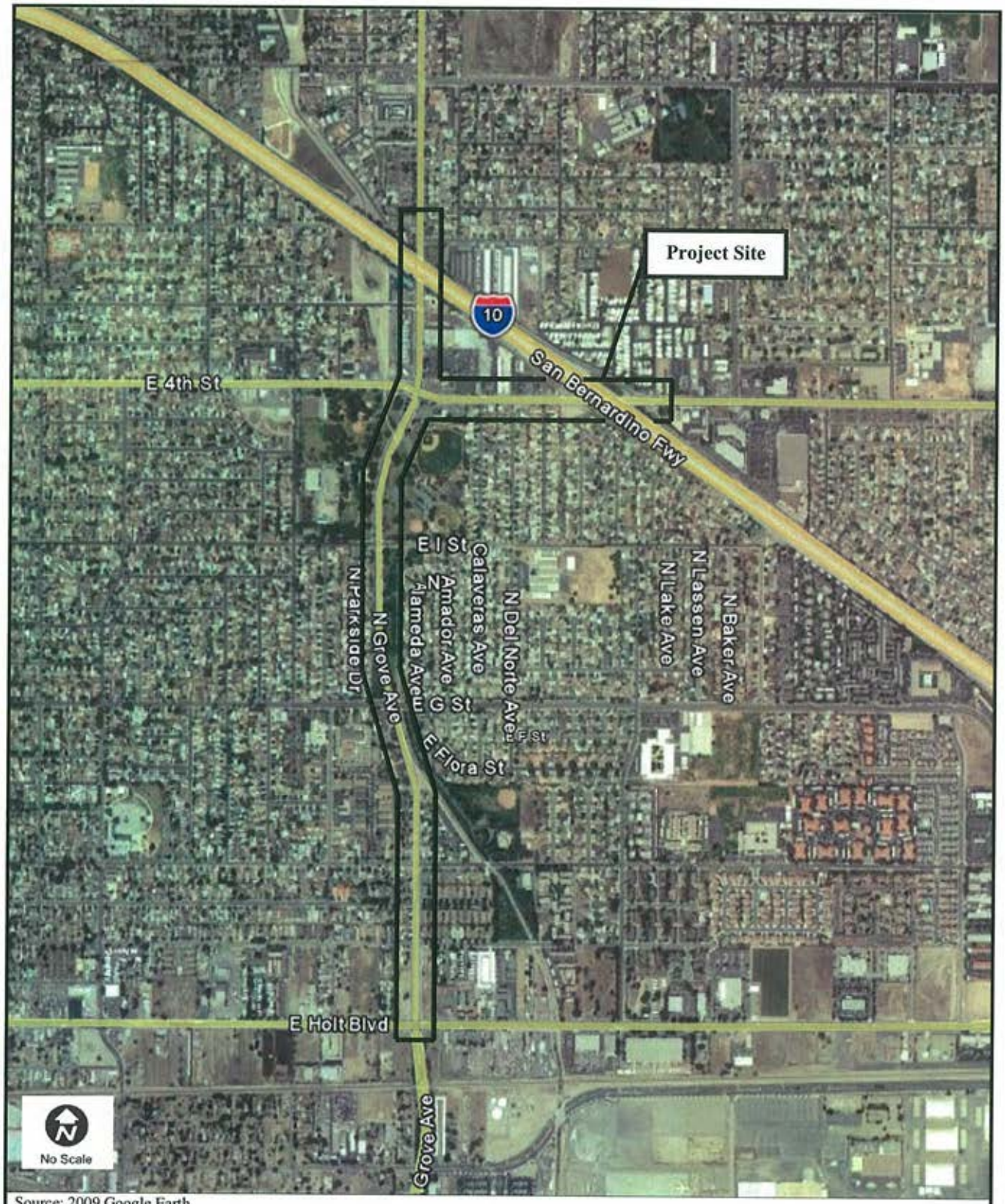
REGIONAL LOCATION MAP



Attachment 1
Regional Location Map

ATTACHMENT 2

PROJECT LOCATION MAP



Source: 2009 Google Earth

Attachment 2
Project Location Map

ATTACHMENT 3

EXISTING LANE GEOMETRY

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

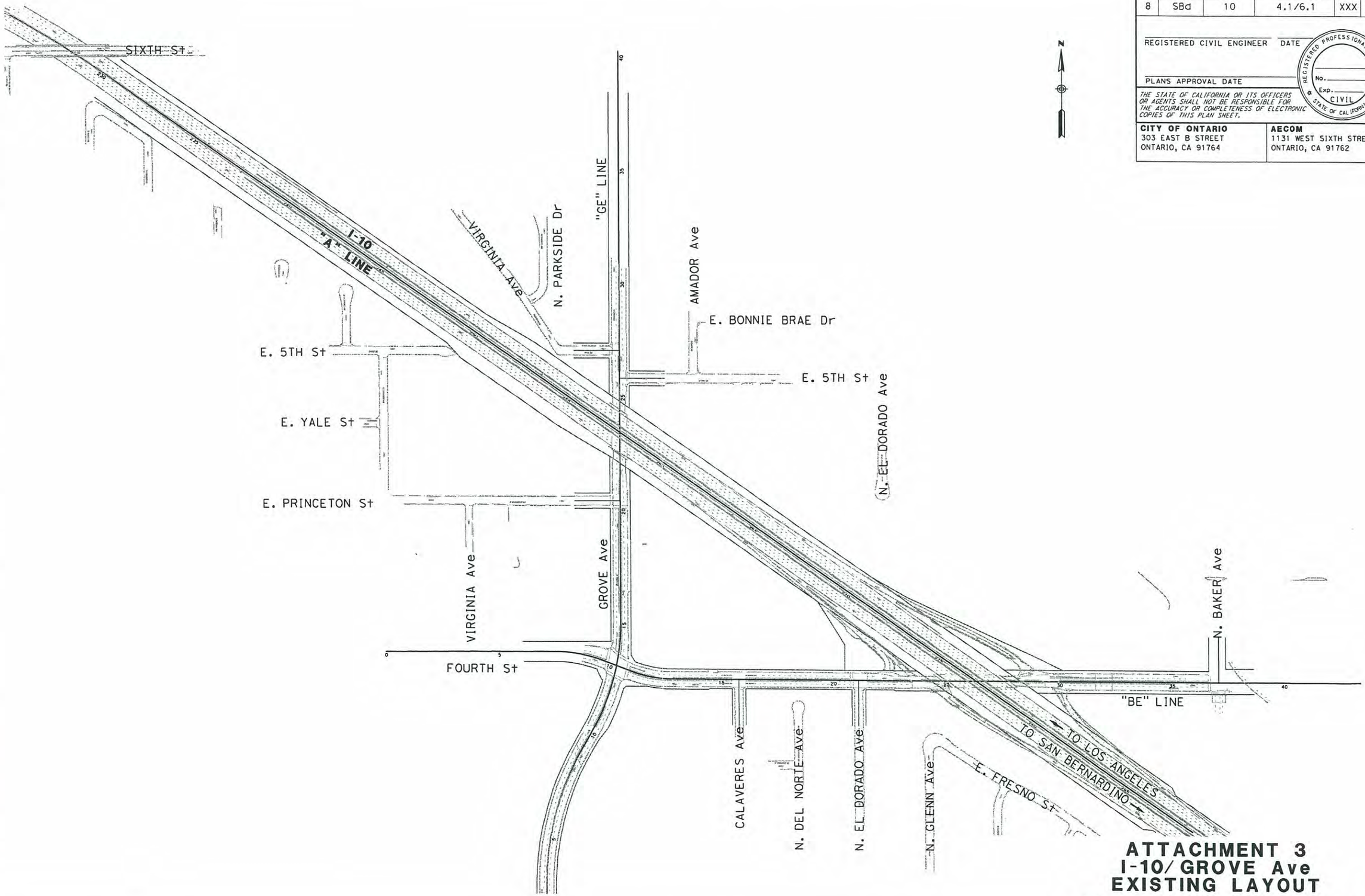
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



ATTACHMENT 3
I-10/ GROVE Ave
EXISTING LAYOUT

SCALE 1" = 200'

200 0 200 400

L-1

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

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

DESIGN OVERSIGHT
NASSIM ELIAS

BORDER LAST REVISED 11/1/2006 | RELATIVE BORDER SCALE 0 1 2 3 | USERNAME => $USER | DGN FILE => $REQUEST | CU 00000 | EA 0J400K

LAST REVISION | DATE PLOTTED => $DATE | TIME PLOTTED => $TIME

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

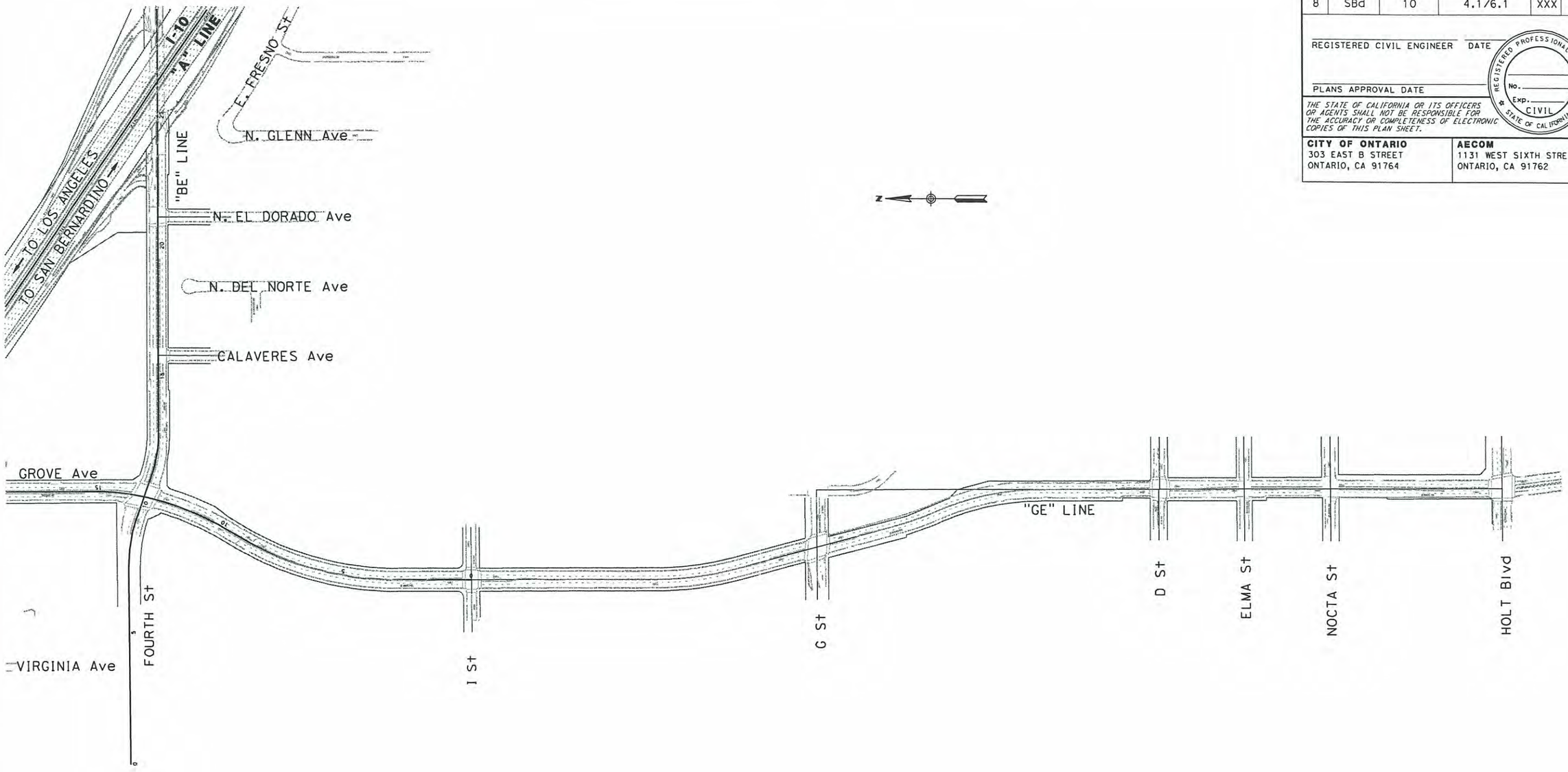
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



ATTACHMENT 3
I-10/GROVE Ave
EXISTING LAYOUT

SCALE 1" = 200'

200 0 200 400

L-2

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

DESIGN OVERSIGHT: NASSIM ELIAS
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION DATE PLOTTED => $DATE
00-00-00 TIME PLOTTED => $TIME

BORDER LAST REVISED 11/1/2006

RELATIVE BORDER SCALE 0 1 2 3

USERNAME => $USER
DGN FILE => $REQUEST

CU 00000

EA 0J400K

ATTACHMENT 4

EXISTING CONDITION ANALYSIS

Table 5: Existing Intersection Levels of Service

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Delay (Sec)	V/C	LOS	Delay (Sec)	V/C
1. Euclid Avenue/7th Street	B	12.5	0.67	B	11.9	0.65
2. Euclid Avenue/I-10 Eastbound Ramps	C	26.3	0.95	B	15.7	0.77
3. Euclid Avenue/4th Street	C	25.1	0.73	C	23.8	0.73
4. Euclid Avenue/Holt Boulevard	B	17.7	0.50	**E**	**55.5**	**0.90**
5. I-10 Westbound Off Ramp/7th Street*	C	21.5	-	**E**	**38.8**	-
6. Grove Avenue/6th Street	B	14.6	0.45	B	14.9	0.40
7. Grove Avenue/5th Street*	**F**	**185.0**	-	**F**	**68.8**	-
8 Grove Avenue/Princeton Street*	**F**	**86.7**	-	**E**	**37.4**	-
9. Grove Avenue/4th Street	C	27.8	0.81	C	25.8	0.79
10. Grove Avenue/G Street	B	12.5	0.46	A	9.8	0.40
11. Grove Avenue/D Street	A	7.8	0.40	A	7.4	0.39
12. Grove Avenue/Holt Boulevard	C	25.9	0.77	C	32.5	0.82
13. Grove Avenue/Airport Drive	B	18.8	0.73	B	16.7	0.67
14. El Dorado Avenue/4th Street	B	13.3	0.48	B	15.5	0.36
15. I-10 Eastbound Ramps/4th Street	A	8.1	0.56	B	15.8	0.76
16. I-10 Westbound Ramps/4th Street	B	18.5	0.76	B	13.6	0.67
17. Baker Ave/4th Street	B	18.8	0.27	B	15.5	0.40
18. Vineyard Avenue//4th Street	B	19.4	0.68	C	26.8	0.78
19. Vineyard Avenue/Inland Empire Boulevard	A	4.5	0.51	A	6.6	0.58
20. Vineyard Avenue/I-10 Westbound Ramps	A	6.0	0.60	A	9.3	0.85
21. Vineyard Avenue/I-10 Eastbound Ramps	B	13.4	0.75	B	15.5	0.81
22. Vineyard Avenue/G Street	B	12.5	0.60	A	7.6	0.45
23. Vineyard Avenue/D Street	B	11.1	0.40	B	14.1	0.48
24. Vineyard Avenue/Holt Boulevard	C	22.3	0.53	C	26.0	0.54
25. Vineyard Avenue/Airport Drive	C	21.1	0.43	C	24.4	0.55

Notes:
HCM 2000 Operations Methodology. **BOLD** indicates unsatisfactory level of service.
LOS = Level of Service, Delay = Average Vehicle Delay (Seconds), V/C = Volume-to-Capacity Ratio
*Unsignalized intersection delay for stop-controlled approach; V/C not applicable

Table 6: Existing Intersection Queue Lengths

Intersection	AM Peak Hour		PM Peak Hour	
	Space Provided (Ft)	Queue Length 95th %ile (Ft)	Space Provided (Ft)	Queue Length 95th %ile (Ft)
4th St/Grove Ave				
Westbound Left turn lane[1]	115	**231**	115	**242**
Westbound Through lane	974	115	974	230
Southbound Left turn lane	120	**321**	120	**269**
Southbound Through lane	633	96	633	164
4th St/El Dorado Ave				
Westbound Left turn lane	55	**109**	55	**80**
Westbound Through lane	198	79	198	132
Eastbound Left turn lane[2]	75	7	75	3
Eastbound Through lane	974	180	974	179
4th St/I-10 EB Ramps				
Westbound Left turn lane	150	72	150	**188**
Westbound Through lane	490	160	490	161
Eastbound Through lane	198	113	198	178
Southbound Left turn lane	290	128	290	268
Southbound Right turn lane	290	43	290	73
4th St/I-10 WB Ramps				
Northbound Left turn lane	300	246	300	205
Eastbound Left turn lane	150	**203**	150	128
Eastbound Through lane	490	107	490	160
4th St/Baker Ave				
Westbound Through lane	750	98	750	78
Eastbound Left turn lane[3]	100	**110**	100	**181**
Eastbound Through lane	694	101	694	148

Notes: **BOLD** indicates inadequate queuing distance.
[1] An additional 260' of queuing space is available in the two-way left-turn lane.
[2] An additional 340' of queuing space is available in the two-way left-turn lane.
[3] An additional 390' of queuing space is available in the two-way left-turn lane.

Table 7: Existing Freeway Mainline Levels of Service

Freeway Segment	AM Peak Hour				PM Peak Hour			
	Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS	Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS
Eastbound								
Euclid Avenue to 4th Street	7,524	58.2	34.0	D	7,376	58.6	33.1	D
4th Street to Vineyard Avenue	7,818	57.1	36.0	E	7,241	59.0	32.3	D
Westbound								
Vineyard Avenue to 4th Street	6,542	59.9	28.7	D	7,428	58.5	33.4	D
4th Street to Euclid Avenue	6,939	59.5	30.7	D	7,609	57.9	34.6	D

Notes:

[1] Average passenger-car speed.

Level of Service (LOS) criteria are provided in the *Highway Capacity Manual*, and are based on density.

Table 8: Existing Freeway Ramp Levels of Service

Ramp	AM Peak Hour				PM Peak Hour			
	Ramp Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS	Ramp Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS
Eastbound								
Euclid Ave Off Ramp	882	50.8	36.3	E	1,201	50.2	37.3	E
Euclid Ave On Ramp	1,108	51.7	30.9	D	552	52.9	27.9	C
4th St Off Ramp	318	51.8	33.2	D	655	51.2	34.4	D
4th St On Ramp	612	52.3	29.5	D	520	53.0	27.2	C
Vineyard Ave Off Ramp	639	51.2	37.0	E	839	50.9	35.8	E
Vineyard Ave On Ramp[2]	-	-	-	-	-	-	-	-
Westbound								
Vineyard Ave Off Ramp[2]	-	-	-	-	-	-	-	-
Vineyard Ave Loop On Ramp	252	53.8	23.4	C	496	54.0	22.7	C
Vineyard Ave Direct On Ramp	492	52.3	28.1	D	407	50.0	32.3	D
4th St Off Ramp	399	51.6	30.6	D	495	51.5	34.6	D
4th St On Ramp	796	52.8	28.1	D	676	54.0	25.0	C
7th St Off Ramp	796	50.9	33.5	D	1,011	50.6	37.2	E
Euclid Ave Loop On Ramp	368	51.6	30.1	D	410	51.0	31.4	D
Euclid Ave Direct On Ramp	718	52.7	27.5	C	581	52.0	29.2	D

Notes:

[1] Speed in ramp influence area. All ramps are a single lane at the gore point.

[2] Part of weaving segment.

Level of Service (LOS) criteria are provided in the *Highway Capacity Manual*, and are based on density.

Table 9: Existing Freeway Weaving Levels of Service

Weave Segment	AM Peak Hour				PM Peak Hour			
	Non-weaving Volume	Weaving Volume	Density (pc/mi/ln)	LOS	Non-weaving Volume	Weaving Volume	Density (pc/mi/ln)	LOS
Eastbound								
Vineyard Ave to Archibald Ave	6,697	1,274	30.63	C	5,927	1,105	26.54	C
Westbound								
Archibald Ave to Vineyard Ave	5,245	1,124	25.41	C	5,895	1,421	30.51	C

Notes:
Level of Service (LOS) criteria are provided in the *Highway Capacity Manual*, and are based on density.

ATTACHMENT 5

OPENING YEAR 2017 AND DESIGN YEAR (2040) CONDITION ANALYSIS

Table 10: Year 2017 No Build Intersection Levels of Service

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Delay (Sec)	V/C	LOS	Delay (Sec)	V/C
1. Euclid Avenue/7th Street	B	10.5	0.67	B	10.1	0.69
2. Euclid Avenue/I-10 Eastbound Ramps	**F**	**42.6**	**1.06**	C	27.4	0.88
3. Euclid Avenue/4th Street	C	28.2	0.82	D	41.5	0.87
4. Euclid Avenue/Holt Boulevard	C	20.1	0.64	**F**	**91.5**	**1.12**
5. I-10 Westbound Off Ramp/7th Street*	**E**	**41.6**	-	**F**	**87.4**	-
6. Grove Avenue/6th Street	B	12.7	0.45	B	19.5	0.49
7. Grove Avenue/5th Street*	**F**	**>500**	-	**F**	**290.5**	-
8 Grove Avenue/Princeton Street*	**F**	**113.7**	-	**F**	**85.1**	-
9. Grove Avenue/4th Street	C	28.4	0.83	D	39.7	0.89
10. Grove Avenue/G Street	B	11.1	0.47	B	14.4	0.51
11. Grove Avenue/D Street	A	9.4	0.47	B	14.9	0.55
12. Grove Avenue/Holt Boulevard	D	42.9	0.94	**E**	**56.7**	**0.98**
13. Grove Avenue/Airport Drive	B	14.5	0.60	B	16.9	0.64
14. El Dorado Avenue/4th Street	B	10.9	0.45	B	17.6	0.40
15. I-10 Eastbound Ramps/4th Street	B	10.9	0.69	C	26.6	0.92
16. I-10 Westbound Ramps/4th Street	B	15.1	0.67	C	21.9	0.79
17. Baker Ave/4th Street	B	14.5	0.27	B	11.9	0.46
18. Vineyard Avenue//4th Street	C	21.2	0.77	D	48.6	0.95
19. Vineyard Avenue/Inland Empire Boulevard	A	5.9	0.57	B	15.7	0.80
20. Vineyard Avenue/I-10 Westbound Ramps	A	6.1	0.67	B	13.2	0.95
21. Vineyard Avenue/I-10 Eastbound Ramps	B	19.0	0.83	B	15.4	0.85
22. Vineyard Avenue/G Street	A	10.0	0.63	A	8.5	0.53
23. Vineyard Avenue/D Street	A	7.9	0.45	B	12.5	0.55
24. Vineyard Avenue/Holt Boulevard	C	22.3	0.59	C	23.6	0.71
25. Vineyard Avenue/Airport Drive	C	22.5	0.57	C	29.9	0.77

Notes:
HCM 2000 Operations Methodology. **BOLD** indicates unsatisfactory level of service.
LOS = Level of Service, Delay = Average Vehicle Delay (Seconds), V/C = Volume-to-Capacity Ratio
Per the CMP, LOS is F if V/C > 1
*Unsignalized intersection delay for stop-controlled approach; V/C not applicable

Table 11: Year 2017 Alternative 1 Intersection Levels of Service

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Delay (Sec)	V/C	LOS	Delay (Sec)	V/C
1. Euclid Avenue/7th Street	A	9.2	0.67	B	10.1	0.69
2. Euclid Avenue/I-10 Eastbound Ramps	**F**	**44.2**	**1.07**	C	27.4	0.88
3. Euclid Avenue/4th Street	C	25.2	0.82	D	41.6	0.86
4. Euclid Avenue/Holt Boulevard	B	17.6	0.65	**F**	**91.7**	**1.12**
5. I-10 Westbound Off Ramp/7th Street*	**E**	**41.6**	-	**F**	**87.4**	-
6. Grove Avenue/6th Street	B	11.1	0.45	C	21.8	0.50
7. Grove Avenue/5th Street*	A	4.7	0.40	A	6.7	0.33
8 Grove Avenue/Princeton Street*	A	2.9	0.27	A	2.9	0.27
9. Grove Avenue/4th Street	B	15.7	0.54	B	15.3	0.58
10. Grove Avenue/G Street	B	16.8	0.40	B	17.2	0.40
11. Grove Avenue/D Street	B	10.9	0.36	B	14.2	0.45
12. Grove Avenue/Holt Boulevard	C	25.8	0.69	C	29.6	0.79
13. Grove Avenue/Airport Drive	B	12.6	0.64	B	13.8	0.64
14. El Dorado Avenue/4th Street*	B	14.2	-	B	12.2	-
15. I-10 Eastbound Ramps/4th Street	A	8.4	0.35	B	16.5	0.46
16. I-10 Westbound Ramps/4th Street	A	8.7	0.44	A	8.7	0.48
17. Baker Ave/4th Street	B	11.6	0.23	B	11.7	0.37
18. Vineyard Avenue//4th Street	D	37.7	0.71	B	18.8	0.65
19. Vineyard Avenue/Inland Empire Boulevard	A	8.2	0.58	B	13.6	0.80
20. Vineyard Avenue/I-10 Westbound Ramps	A	5.6	0.68	B	13.0	0.95
21. Vineyard Avenue/I-10 Eastbound Ramps	B	16.0	0.83	B	17.4	0.85
22. Vineyard Avenue/G Street	A	8.8	0.64	A	6.7	0.53
23. Vineyard Avenue/D Street	A	7.4	0.44	B	11.8	0.55
24. Vineyard Avenue/Holt Boulevard	C	21.5	0.61	C	23.2	0.71
25. Vineyard Avenue/Airport Drive	C	23.5	0.57	C	27.6	0.77

Notes:
HCM 2000 Operations Methodology. **BOLD** indicates unsatisfactory level of service.
LOS = Level of Service, Delay = Average Vehicle Delay (Seconds), V/C = Volume-to-Capacity Ratio
Per the CMP, LOS is F if V/C > 1
*Unsignalized intersection delay for stop-controlled approach; V/C not applicable

Table 12: Year 2017 Alternative 2 Intersection Levels of Service

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Delay (Sec)	V/C	LOS	Delay (Sec)	V/C
1. Euclid Avenue/7th Street	A	9.4	0.68	A	9.0	0.69
2. Euclid Avenue/I-10 Eastbound Ramps	**F**	**45.2**	**1.05**	C	25.4	0.89
3. Euclid Avenue/4th Street	C	28.9	0.83	D	41.7	0.87
4. Euclid Avenue/Holt Boulevard	B	17.6	0.66	**F**	**92.6**	**1.12**
5. I-10 Westbound Off Ramp/7th Street*	**E**	**43.0**	-	**F**	**85.1**	-
6. Grove Avenue/6th Street	B	11.1	0.45	B	12.2	0.50
9. Grove Avenue/4th Street	B	17.0	0.52	B	14.0	0.62
10. Grove Avenue/G Street	B	14.6	0.39	B	17.2	0.40
11. Grove Avenue/D Street	B	10.6	0.35	B	12.9	0.44
12. Grove Avenue/Holt Boulevard	C	28.6	0.74	C	35.9	0.77
13. Grove Avenue/Airport Drive	B	13.7	0.62	B	12.6	0.4
14. El Dorado Avenue/4th Street	B	13.1	0.33	B	12.0	0.30
17. Baker Ave/4th Street	B	10.3	0.22	A	9.7	0.36
18. Vineyard Avenue//4th Street	B	15.0	0.55	B	17.5	0.71
19. Vineyard Avenue/Inland Empire Boulevard	A	9.6	0.60	B	13.2	0.79
20. Vineyard Avenue/I-10 Westbound Ramps	A	5.0	0.66	B	10.3	0.93
21. Vineyard Avenue/I-10 Eastbound Ramps	B	16.8	0.85	B	16.3	0.86
22. Vineyard Avenue/G Street	B	11.1	0.63	A	7.2	0.54
23. Vineyard Avenue/D Street	A	8.8	0.46	A	9.8	0.56
24. Vineyard Avenue/Holt Boulevard	C	20.1	0.62	C	21.4	0.70
25. Vineyard Avenue/Airport Drive	C	22.0	0.58	C	32.6	0.77
26. Grove Avenue/I-10 Eastbound Ramps	B	11.2	0.54	B	10.4	0.53
27. Grove Avenue/I-10 Westbound Ramps	B	10.9	0.58	A	9.9	0.52

Notes:
HCM 2000 Operations Methodology. **BOLD** indicates unsatisfactory level of service.
LOS = Level of Service, Delay = Average Vehicle Delay (Seconds), V/C = Volume-to-Capacity Ratio
Per the CMP, LOS is F if V/C > 1
*Unsignalized intersection delay for stop-controlled approach; V/C not applicable

Table 13: Year 2017 Alternative 3 Intersection Levels of Service

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	**Delay (Sec)**	**V/C**	**LOS**	**Delay (Sec)**	**V/C**
1. Euclid Avenue/7th Street	A	9.4	0.68	B	12.5	0.68
2. Euclid Avenue/I-10 Eastbound Ramps	**F**	**45.2**	**1.05**	C	23.0	0.87
3. Euclid Avenue/4th Street	C	28.9	0.83	D	35.7	0.89
4. Euclid Avenue/Holt Boulevard	B	17.6	0.66	**F**	**101.1**	**1.13**
5. I-10 Westbound Off Ramp/7th Street*	**E**	**43.0**	-	**F**	**85.1**	-
6. Grove Avenue/6th Street	B	11.5	0.44	B	13.3	0.50
9. Grove Avenue/4th Street	B	14.3	0.54	B	19.6	0.63
10. Grove Avenue/G Street	B	16.7	0.40	B	15.7	0.40
11. Grove Avenue/D Street	B	10.6	0.35	B	14.1	0.44
12. Grove Avenue/Holt Boulevard	C	24.5	0.69	C	32.4	0.78
13. Grove Avenue/Airport Drive	B	12.5	0.63	B	16.3	0.67
14. El Dorado Avenue/4th Street	B	12.5	0.33	A	8.3	0.30
17. Baker Ave/4th Street	A	8.5	0.22	A	5.4	0.36
18. Vineyard Avenue//4th Street	B	16.3	0.56	C	20.0	0.95
19. Vineyard Avenue/Inland Empire Boulevard	A	9.0	0.60	B	15.9	0.77
20. Vineyard Avenue/I-10 Westbound Ramps	A	5.0	0.66	B	12.0	0.91
21. Vineyard Avenue/I-10 Eastbound Ramps	B	17.2	0.85	B	19.8	0.84
22. Vineyard Avenue/G Street	B	11.0	0.63	A	9.0	0.52
23. Vineyard Avenue/D Street	A	8.2	0.46	B	13.0	0.55
24. Vineyard Avenue/Holt Boulevard	B	19.0	0.66	C	27.8	0.70
25. Vineyard Avenue/Airport Drive	C	21.0	0.58	C	33.4	0.76
26. Grove Avenue/I-10 Eastbound Ramps	A	4.5	0.43	A	5.3	0.48
27. Grove Avenue/I-10 Westbound Ramps	A	6.2	0.38	A	7.0	0.35

Notes:
HCM 2000 Operations Methodology. **BOLD** indicates unsatisfactory level of service.
LOS = Level of Service, Delay = Average Vehicle Delay (Seconds), V/C = Volume-to-Capacity Ratio
Per the CMP, LOS is F if V/C > 1
*Unsignalized intersection delay for stop-controlled approach; V/C not applicable

Table 14: Year 2017 No Build Intersection Queue Lengths

Intersection	AM Peak Hour		PM Peak Hour	
	Space Provided (Ft)	Queue Length 95th %ile (Ft)	Space Provided (Ft)	Queue Length 95th %ile (Ft)
4th St/Grove Ave				
Westbound Left turn lane[1]	115	**222**	115	**292**
Westbound Through lane	974	186	974	345
Southbound Left turn lane	120	**318**	120	**355**
Southbound Through lane	633	84	633	259
4th St/El Dorado Ave				
Westbound Left turn lane	55	**82**	55	**83**
Westbound Through lane	198	74	198	174
Eastbound Left turn lane[2]	75	6	75	3
Eastbound Through lane	974	52	974	339
4th St/I-10 EB Ramps				
Westbound Left turn lane	150	59	150	**301**
Westbound Through lane	490	107	490	200
Eastbound Through lane	198	129	198	**763**
Southbound Left turn lane	290	205	290	**511**
Southbound Right turn lane	290	55	290	94
4th St/I-10 WB Ramps				
Northbound Left turn lane	300	209	300	**316**
Northbound Right turn lane	300	95	300	210
Eastbound Left turn lane	150	130	150	144
Eastbound Through lane	490	293	490	335
4th St/Baker Ave				
Eastbound Left turn lane[3]	100	89	100	**162**
Eastbound Through lane	694	118	694	132

Notes: **BOLD** indicates inadequate queuing distance.
[1] An additional 260' of queuing space is available in the two-way left-turn lane.
[2] An additional 340' of queuing space is available in the two-way left-turn lane.
[3] An additional 390' of queuing space is available in the two-way left-turn lane.

Table 15: Year 2017 Alternative 1 Intersection Queue Lengths

Intersection	Space Provided (Ft)	AM Peak Hour Queue Length 95th %ile (Ft)	PM Peak Hour Queue Length 95th %ile (Ft)
4th St/Grove Ave			
Westbound Left Turn lane	150	81	52
Westbound Through lane	1,168	0	41
Southbound Left Turn lane	160	127	102
Southbound Through lane	604	41	99
4th St/I-10 EB Ramps			
Westbound Left Turn lane	188	32	101
Westbound Through lane	392	41	57
Eastbound Through lane	413	90	136
Southbound Left Turn lane	160	68	121
Southbound Right Turn lane	320	57	79
4th St/I-10 WB Ramps			
Northbound Left Turn lane	200	148	179
Northbound Right turn lane	200	69	128
Westbound Through lane	666	65	67
Eastbound Left Turn lane	172	49	49
Eastbound Through lane	412	22	14
4th St/Baker Ave			
Eastbound Left Turn lane	184	74	146
Eastbound Through lane	588	65	86

As can be seen in the table, adequate queuing space is provided.

Table 16: Year 2017 Alternative 2 Intersection Queue Lengths

Intersection	Space Provided (Ft)	AM Peak Hour Queue Length 95th %ile (Ft)	PM Peak Hour Queue Length 95th %ile (Ft)
I-10 Westbound Ramps/Grove Ave			
Northbound Left turn lane	367	144	141
Northbound Through lane	524	6	4
Westbound Left turn lane	800	161	141
Westbound Through/Left turn lane	800	158	139
Westbound Right turn lane	183	38	58
I-10 Eastbound Ramps/Grove Ave			
Northbound Through lane	590	167	79
Northbound Right turn lane	186	54	22
Southbound Left turn lane	279	101	60
Southbound Through lane	505	0	0
Eastbound Left turn lane	1,000	54	38
Eastbound Through/Right turn lane	400	63	73
4th St/Grove Ave			
Southbound Left turn lane	160	89	94
Southbound Through lane	568	104	90
Southbound Right turn lane	140	32	43

Table 17: Year 2017 Alternative 3 Intersection Queue Lengths

Intersection	Space Provided (Ft)	AM Peak Hour	PM Peak Hour
		Queue Length 95th %ile (Ft)	Queue Length 95th %ile (Ft)
I-10 Westbound Ramps/Grove Ave			
Northbound Through lane	531	14	31
Northbound Right turn lane	531	0	37
Westbound Left turn lane	1,130	133	123
Westbound Through/Left turn lane	1,130	133	123
Westbound Right turn lane	128	37	42
I-10 Eastbound Ramps/Grove Ave			
Northbound Through lane	633	54	28
Northbound Right turn lane	190	2	0
Southbound Through lane	456	6	23
Eastbound Left turn lane	1,136	49	33
Eastbound Through/Right turn lane	163	69	81
4th St/Grove Ave			
Southbound Left turn lane	160	82	91
Southbound Through lane	567	120	95
Southbound Right turn lane	140	29	16

Table 18: Year 2017 No Build Freeway Mainline Levels of Service

Freeway Segment	AM Peak Hour				PM Peak Hour			
	Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS	Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS
Eastbound								
Freeway Mainline between Euclid Ave & 4th St	**9,284**	-	**> 45.0**	**F**	**9,215**	-	**> 45.0**	**F**
Freeway Mainline between 4th St & Vineyard Ave	**9,467**	-	**> 45.0**	**F**	**9,106**	-	**> 45.0**	**F**
Westbound								
Freeway Mainline between 4th St & Vineyard Ave	7,780	57.2	35.8	E	**9,349**	-	**> 45.0**	**F**
Freeway Mainline between Euclid Ave & 4th St	8,162	55.3	38.8	E	**9,542**	-	**> 45.0**	**F**

Notes:

[1] Average passenger-car speed. **BOLD** indicates unsatisfactory level of service.

Level of Service (LOS) criteria are provided in the *Highway Capacity Manual*, and are based on density.

Table 19: Year 2017 Alternative 2 Freeway Mainline Levels of Service

Freeway Segment	AM Peak Hour				PM Peak Hour			
	Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS	Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS
Eastbound								
Freeway Mainline between Euclid Ave & Grove Ave	**9,243**	-	**> 45.0**	**F**	8,608	52.2	43.4	E
Freeway Mainline between Grove Ave & Vineyard Ave	**9,600**	-	**> 45.0**	**F**	**8,781**	-	**> 45.0**	**F**
Westbound								
Freeway Mainline between Grove Ave & Vineyard Ave	7,936	56.5	36.9	E	**9,144**	-	**> 45.0**	**F**
Freeway Mainline between Euclid Ave & Grove Ave	7,767	57.3	35.7	E	**8,983**	-	**> 45.0**	**F**

Notes:
[1] Average passenger-car speed. **BOLD** indicates unsatisfactory level of service.
Level of Service (LOS) criteria are provided in the *Highway Capacity Manual*, and are based on density.

Table 20: Year 2017 No Build Freeway Ramp Levels of Service

Ramp	AM Peak Hour				PM Peak Hour			
	Ramp Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS	Ramp Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS
Eastbound								
Euclid Ave Off Ramp	**1,113**	-	-	**F***	**1,225**	-	-	**F***
Euclid Ave On Ramp	**1,108**	-	-	**F***	**806**	-	-	**F***
4th St Off Ramp	**546**	-	-	**F***	**757**	-	-	**F***
4th St On Ramp	**730**	-	-	**F***	**649**	-	-	**F***
Vineyard Ave Off Ramp	**1,026**	-	-	**F***	**998**	-	-	**F***
Vineyard Ave On Ramp[2]	-	-	-	-	-	-	-	-
Westbound								
Vineyard Ave Off Ramp[2]	-	-	-	-	-	-	-	-
Vineyard Ave Loop On Ramp	252	53.3	26.4	C	493	51.4	32.2	D
Vineyard Ave Direct On Ramp	617	52.5	28.5	D	**749**	-	-	**F***
4th St Off Ramp	436	51.6	35.2	E	**536**	-	-	**F***
4th St On Ramp	818	51.3	32.2	D	**728**	-	-	**F***
7th St Off Ramp	936	50.7	39.0	E	**1,180**	-	-	**F***
Euclid Ave Loop On Ramp	368	53.5	25.0	C	**410**	-	-	**F***
Euclid Ave Direct On Ramp	718	51.9	29.4	D	**581**	-	-	**F***

Notes:

[1] Speed in ramp influence area. All ramps are a single lane at the gore point.

[2] Part of weaving segment.

Level of Service (LOS) criteria are provided in the *Highway Capacity Manual*, and are based on density. **BOLD** indicates unsatisfactory level of service.

* Freeway is over capacity. Speed and Density are not predicted when freeway is over capacity, per *HCM*.

Table 21: Year 2017 Alternative 2 Freeway Ramp Levels of Service

Ramp	AM Peak Hour				PM Peak Hour			
	Ramp Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS	Ramp Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS
Eastbound								
Euclid Ave Off Ramp	**1,140**	-	-	**F***	1,263	50.1	42.5	E
Euclid Ave On Ramp	**1,301**	-	-	**F***	788	50.7	33.0	D
Grove Ave Off Ramp	**555**	-	-	**F***	641	51.2	40.2	E
Grove Ave On Ramp	**912**	-	-	**F***	**814**	-	-	**F***
Vineyard Ave Off Ramp	**1106**	-	-	**F***	**1006**	-	-	**F***
Vineyard Ave On Ramp[2]	-	-	-	-	-	-	-	-
Westbound								
Vineyard Ave Off Ramp[2]	-	-	-	-	-	-	-	-
Vineyard Ave Loop On Ramp	252	53.2	26.7	C	493	51.7	31.4	D
Vineyard Ave Direct On Ramp	694	52.2	29.3	D	**778**	-	-	**F***
Grove Ave Off Ramp	759	51.0	26.0	C	**728**	-	-	**F***
Grove Ave On Ramp	590	52.3	29.8	D	**567**	-	-	**F***
7th St Off Ramp	945	50.7	37.5	E	**1,152**	-	-	**F***
Euclid Ave Loop On Ramp	368	53.8	23.7	C	410	52.7	27.3	C
Euclid Ave Direct On Ramp	718	52.5	28.1	D	**581**	-	-	**F***

Notes:

[1] Speed in ramp influence area. All ramps are a single lane at the gore point.

[2] Part of weaving segment.

Level of Service (LOS) criteria are provided in the *Highway Capacity Manual*, and are based on density. **BOLD** indicates unsatisfactory level of service.

* Freeway is over capacity. Speed and Density are not predicted when freeway is over capacity, per *HCM*.

Table 22: Year 2017 Alternative 3 Freeway Ramp Levels of Service

Ramp	AM Peak Hour				PM Peak Hour			
	Ramp Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS	Ramp Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS
Eastbound								
Euclid Ave Off Ramp	**1,140**	-	-	**F***	1,263	50.1	42.5	E
Euclid Ave On Ramp	**1,301**	-	-	**F***	788	50.7	33.0	D
Grove Ave Off Ramp	**555**	-	-	**F***	641	51.2	40.2	E
Grove Ave Loop On Ramp	**321**	-	-	**F***	182	52.5	29.3	D
Grove Ave Direct On Ramp	**591**	-	-	**F***	**632**	-	-	**F***
Vineyard Ave Off Ramp	**1,106**	-	-	**F***	**1,006**	-	-	**F***
Vineyard Ave On Ramp[2]	-	-	-	-	-	-	-	-
Westbound								
Vineyard Ave Off Ramp[2]	-	-	-	-	-	-	-	-
Vineyard Ave Loop On Ramp	252	53.2	26.7	C	493	50.5	33.8	D
Vineyard Ave Direct On Ramp	694	52.2	29.3	D	**778**	-	-	**F***
Grove Ave Off Ramp	759	51.0	26.0	C	**728**	-	-	**F***
Grove Ave Loop On Ramp	549	52.4	29.5	D	**508**	-	-	**F***
Grove Ave Direct On Ramp	41	53.1	27.4	C	**59**	-	-	**F***
7th St Off Ramp	945	50.7	37.5	E	**1,152**	-	-	**F***
Euclid Ave Loop On Ramp	368	53.8	23.7	C	410	52.7	27.3	C
Euclid Ave Direct On Ramp	718	52.5	28.1	D	**581**	-	-	**F***

Notes:

[1] Speed in ramp influence area. All ramps are a single lane at the gore point.

[2] Part of weaving segment.

Level of Service (LOS) criteria are provided in the *Highway Capacity Manual*, and are based on density. **BOLD** indicates unsatisfactory level of service.

* Freeway is over capacity. Speed and Density are not predicted when freeway is over capacity, per *HCM*.

Table 23: Year 2017 No Build Freeway Weaving Levels of Service

Weave Segment	AM Peak Hour				PM Peak Hour			
	Non-weaving Volume	Weaving Volume	Density (pc/mi/ln)	LOS	Non-weaving Volume	Weaving Volume	Density (pc/mi/ln)	LOS
Eastbound								
Vineyard Ave to Archibald Ave	7,394	1,930	38.2	E	7,197	1,607	35.0	D
Westbound								
Archibald Ave to Vineyard Ave	6,079	1,513	32.1	D	**6,889**	**2,152**	**41.6**	**F**

Notes:
Level of Service (LOS) criteria are provided in the *Highway Capacity Manual*, and are based on density.

Table 24: Year 2017 Alternative 2 Freeway Weaving Levels of Service

Weave Segment	AM Peak Hour				PM Peak Hour			
	Non-weaving Volume	Weaving Volume	Density (pc/mi/ln)	LOS	Non-weaving Volume	Weaving Volume	Density (pc/mi/ln)	LOS
Eastbound								
Vineyard Ave to Archibald Ave	7,416	1,967	38.6	E	6,846	1,627	33.7	D
Westbound								
Archibald Ave to Vineyard Ave	6,100	1,539	32.4	D	**6,631**	**2,132**	**40.3**	**F**

Notes:
Level of Service (LOS) criteria are provided in the *Highway Capacity Manual*, and are based on density.

Table 25: Year 2040 No Build Intersection Levels of Service

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Delay (Sec)	V/C	LOS	Delay (Sec)	V/C
1. Euclid Avenue/7th Street	B	18.2	0.77	C	21.6	0.87
2. Euclid Avenue/I-10 Eastbound Ramps	**F**	**165.7**	**1.52**	**F**	**101.0**	**1.29**
3. Euclid Avenue/4th Street	**F**	**121.9**	**1.25**	**F**	**203.9**	**1.47**
4. Euclid Avenue/Holt Boulevard	**F**	**75.0**	**1.09**	**F**	**313.2**	**1.79**
5. I-10 Westbound Off Ramp/7th Street*	**F**	**216.4**	-	**F**	**297.6**	-
6. Grove Avenue/6th Street	B	16.6	0.65	C	23.4	0.80
7. Grove Avenue/5th Street*	**F**	**>500**	-	**F**	**>500**	-
8 Grove Avenue/Princeton Street*	**F**	**>500**	-	**F**	**>500**	-
9. Grove Avenue/4th Street	**F**	**101.1**	**1.14**	**F**	**119.9**	**1.25**
10. Grove Avenue/G Street	B	19.0	0.67	B	17.4	0.79
11. Grove Avenue/D Street	B	14.1	0.67	C	26.2	0.94
12. Grove Avenue/Holt Boulevard	**F**	**209.7**	**1.51**	**F**	**282.1**	**1.57**
13. Grove Avenue/Airport Drive	C	23.4	0.85	D	35.4	0.95
14. El Dorado Avenue/4th Street	B	18.7	0.61	B	10.7	0.53
15. I-10 Eastbound Ramps/4th Street	**F**	**42.2**	**1.03**	**F**	**142.7**	**1.43**
16. I-10 Westbound Ramps/4th Street	C	20.7	0.94	**F**	**66.7**	**1.17**
17. Baker Ave/4th Street	C	22.5	0.40	B	17.2	0.58
18. Vineyard Avenue//4th Street	**F**	**91.1**	**1.20**	**F**	**227.6**	**1.53**
19. Vineyard Avenue/Inland Empire Boulevard	**F**	**75.9**	**1.11**	**F**	**199.1**	**1.43**
20. Vineyard Avenue/I-10 Westbound Ramps	**F**	**43.2**	**1.13**	**F**	**84.9**	**1.35**
21. Vineyard Avenue/I-10 Eastbound Ramps	**F**	**114.9**	**1.29**	**F**	**77.8**	**1.17**
22. Vineyard Avenue/G Street	C	29.7	0.93	B	15.7	0.89
23. Vineyard Avenue/D Street	B	11.5	0.69	C	25.6	0.92
24. Vineyard Avenue/Holt Boulevard	**F**	**58.1**	**1.04**	**F**	**149.7**	**1.30**
25. Vineyard Avenue/Airport Drive	**F**	**90.3**	**1.13**	**F**	**164.2**	**1.38**

Notes:
HCM 2000 Operations Methodology. **BOLD** indicates unsatisfactory level of service.
LOS = Level of Service, Delay = Average Vehicle Delay (Seconds), V/C = Volume-to-Capacity Ratio
Per the CMP, LOS is F if V/C > 1
*Unsignalized intersection delay for stop-controlled approach; V/C not applicable

Table 26: Year 2040 Alternative 1 Intersection Levels of Service

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Delay (Sec)	V/C	LOS	Delay (Sec)	V/C
1. Euclid Avenue/7th Street	B	19.1	0.77	B	17.4	0.87
2. Euclid Avenue/I-10 Eastbound Ramps	**F**	**165.7**	**1.52**	**F**	**112.5**	**1.30**
3. Euclid Ãvenue/4th Street	**F**	**119.0**	**1.25**	**F**	**204.2**	**1.47**
4. Euclid Avenue/Holt Boulevard	**F**	**75.0**	**1.09**	**F**	**313.2**	**1.79**
5. I-10 Westbound Off Ramp/7th Street*	**F**	**216.4**	-	**F**	**297.6**	-
6. Grove Avenue/6th Street	C	20.2	0.65	C	29.8	0.80
7. Grove Avenue/5th Street*	B	13.8	0.58	A	8.9	0.59
8 Grove Avenue/Princeton Street*	A	3.0	0.35	A	2.8	0.40
9. Grove Avenue/4th Street	C	28.9	0.81	C	24.5	1.76
10. Grove Avenue/G Street	B	17.7	0.55	B	13.1	0.65
11. Grove Avenue/D Street	B	14.6	0.56	C	22.3	0.78
12. Grove Avenue/Holt Boulevard	**F**	**72.1**	**1.08**	**F**	**157.5**	**1.21**
13. Grove Avenue/Airport Drive	D	48.5	0.96	D	43.6	0.99
14. El Dorado Avenue/4th Street	C	19.6	-	B	14.4	-
15. I-10 Eastbound Ramps/4th Street	B	10.3	0.58	B	16.0	0.72
16. I-10 Westbound Ramps/4th Street	B	10.9	0.52	B	13.9	0.63
17. Baker Ave/4th Street	A	8.6	0.34	B	11.9	0.50
18. Vineyard Avenue//4th Street	**E**	**57.8**	**0.97**	D	44.4	0.92
19. Vineyard Avenue/Inland Empire Boulevard	**F**	**79.0**	**1.11**	**F**	**213.5**	**1.43**
20. Vineyard Avenue/I-10 Westbound Ramps	**F**	**43.7**	**1.13**	**F**	**85.3**	**1.35**
21. Vineyard Avenue/I-10 Eastbound Ramps	**F**	**115.0**	**1.29**	**F**	**80.8**	**1.18**
22. Vineyard Avenue/G Street	C	29.9	0.93	B	14.9	0.89
23. Vineyard Avenue/D Street	B	11.5	0.69	C	23.7	0.92
24. Vineyard Avenue/Holt Boulevard	**F**	**58.1**	**1.04**	**F**	**147.8**	**1.29**
25. Vineyard Avenue/Airport Drive	**F**	**90.3**	**1.13**	**F**	**164.7**	**1.38**

Notes:
HCM 2000 Operations Methodology. **BOLD** indicates unsatisfactory level of service.
LOS = Level of Service, Delay = Average Vehicle Delay (Seconds), V/C = Volume-to-Capacity Ratio
Per the CMP, LOS is F if V/C > 1
*Unsignalized intersection delay for stop-controlled approach; V/C not applicable

Table 27: Year 2040 Alternative 2 Intersection Levels of Service

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Delay (Sec)	V/C	LOS	Delay (Sec)	V/C
1. Euclid Avenue/7th Street	B	14.0	0.82	B	17.3	0.86
2. Euclid Avenue/I-10 Eastbound Ramps	**F**	**152.1**	**1.48**	**F**	**98.0**	**1.28**
3. Euclid Avenue/4th Street	**F**	**122.1**	**1.28**	**F**	**206.5**	**1.48**
4. Euclid Avenue/Holt Boulevard	**F**	**74.6**	**1.10**	**F**	**326.1**	**1.80**
5. I-10 Westbound Off Ramp/7th Street*	**F**	**211.7**	-	**F**	**279.9**	-
6. Grove Avenue/6th Street	B	16.0	0.61	C	23.7	0.82
9. Grove Avenue/4th Street	C	24.3	0.78	D	54.1	0.91
10. Grove Avenue/G Street	B	11.2	0.55	B	15.1	0.64
11. Grove Avenue/D Street	A	9.9	0.52	C	22.7	0.75
12. Grove Avenue/Holt Boulevard	**F**	**80.6**	**1.11**	**F**	**164.9**	**1.24**
13. Grove Avenue/Airport Drive	C	24.5	0.87	D	41.7	0.98
14. El Dorado Avenue/4th Street	B	14.8	0.37	B	12.6	0.41
17. Baker Ave/4th Street	B	11.9	0.32	B	12.6	0.47
18. Vineyard Avenue//4th Street	C	21.1	0.75	D	39.2	0.94
19. Vineyard Avenue/Inland Empire Boulevard	**F**	**111.9**	**1.18**	**F**	**192.0**	**1.37**
20. Vineyard Avenue/I-10 Westbound Ramps	**F**	**36.2**	**1.11**	**F**	**63.6**	**1.25**
21. Vineyard Avenue/I-10 Eastbound Ramps	**F**	**148.7**	**1.37**	**F**	**78.6**	**1.18**
22. Vineyard Avenue/G Street	C	32.3	0.95	B	16.0	0.89
23. Vineyard Avenue/D Street	B	11.1	0.69	C	24.3	0.93
24. Vineyard Avenue/Holt Boulevard	**F**	**61.3**	**1.06**	**F**	**144.0**	**1.29**
25. Vineyard Avenue/Airport Drive	**F**	**102.9**	**1.15**	**F**	**155.8**	**1.37**
26. Grove Avenue/I-10 Eastbound Ramps	B	14.4	0.85	B	18.8	0.86
27. Grove Avenue/I-10 Westbound Ramps	B	18.1	0.82	B	15.5	0.74

Notes:
HCM 2000 Operations Methodology. **BOLD** indicates unsatisfactory level of service.
LOS = Level of Service, Delay = Average Vehicle Delay (Seconds), V/C = Volume-to-Capacity Ratio
Per the CMP, LOS is F if V/C > 1
*Unsignalized intersection delay for stop-controlled approach; V/C not applicable

Table 28: Year 2040 Alternative 3 Intersection Levels of Service

Intersection	AM Peak Hour			PM Peak Hour		
	LOS	Delay (Sec)	V/C	LOS	Delay (Sec)	V/C
1. Euclid Avenue/7th Street	B	14.0	0.82	B	19.8	0.85
2. Euclid Avenue/I-10 Eastbound Ramps	**F**	**152.1**	**1.48**	**F**	**104.7**	**1.27**
3. Euclid Avenue/4th Street	**F**	**122.1**	**1.28**	**F**	**198.6**	**1.45**
4. Euclid Avenue/Holt Boulevard	**F**	**74.6**	**1.10**	**F**	**316.7**	**1.78**
5. I-10 Westbound Off Ramp/7th Street*	**F**	**211.7**	-	**F**	**279.9**	-
6. Grove Avenue/6th Street	B	16.1	0.60	C	23.7	0.82
9. Grove Avenue/4th Street	C	24.6	0.77	D	54.5	0.91
10. Grove Avenue/G Street	B	11.1	0.55	B	13.0	0.64
11. Grove Avenue/D Street	B	10.6	0.52	C	22.7	0.75
12. Grove Avenue/Holt Boulevard	**F**	**139.1**	**1.14**	**F**	**143.9**	**1.31**
13. Grove Avenue/Airport Drive	C	25.2	0.87	D	42.0	0.96
14. El Dorado Avenue/4th Street	C	21.4	0.37	B	14.5	0.41
17. Baker Ave/4th Street	B	11.5	0.32	A	8.6	0.47
18. Vineyard Avenue//4th Street	C	22.4	0.75	D	39.6	0.95
19. Vineyard Avenue/Inland Empire Boulevard	**F**	**111.9**	**1.18**	**F**	**176.0**	**1.36**
20. Vineyard Avenue/I-10 Westbound Ramps	**F**	**36.3**	**1.11**	**F**	**63.8**	**1.25**
21. Vineyard Avenue/I-10 Eastbound Ramps	**F**	**148.7**	**1.37**	**F**	**81.2**	**1.17**
22. Vineyard Avenue/G Street	C	32.3	0.95	B	15.7	0.88
23. Vineyard Avenue/D Street	B	11.1	0.69	C	27.3	0.93
24. Vineyard Avenue/Holt Boulevard	**F**	**61.3**	**1.06**	**F**	**140.1**	**1.30**
25. Vineyard Avenue/Airport Drive	**F**	**102.9**	**1.15**	**F**	**154.7**	**1.36**
26. Grove Avenue/I-10 Eastbound Ramps	A	7.9	0.72	B	8.5	0.81
27. Grove Avenue/I-10 Westbound Ramps	B	10.6	0.55	B	13.1	0.49

Notes:
HCM 2000 Operations Methodology. **BOLD** indicates unsatisfactory level of service.
LOS = Level of Service, Delay = Average Vehicle Delay (Seconds), V/C = Volume-to-Capacity Ratio
Per the CMP, LOS is F if V/C > 1
*Unsignalized intersection delay for stop-controlled approach; V/C not applicable

Table 29: Year 2040 No Build Intersection Queue Lengths

Intersection	AM Peak Hour		PM Peak Hour	
	Space Provided (Ft)	Queue Length 95th %ile (Ft)	Space Provided (Ft)	Queue Length 95th %ile (Ft)
4th St/Grove Ave				
Westbound Left turn lane[1]	115	**385**	115	**302**
Westbound Through lane	974	477	974	485
Southbound Left turn lane	120	**692**	120	**477**
Southbound Through lane	633	204	633	541
4th St/El Dorado Ave				
Westbound Left turn lane	55	**117**	55	**82**
Westbound Through lane	198	152	198	27
Eastbound Left turn lane[2]	75	6	75	3
Eastbound Through lane	974	335	974	159
4th St/I-10 EB Ramps				
Westbound Left turn lane	150	107	150	**397**
Westbound Through lane	490	349	490	301
Eastbound Through lane	198	**934**	198	**1,292**
Southbound Left turn lane	290	**711**	290	**977**
Southbound Right turn lane	290	280	290	92
4th St/I-10 WB Ramps				
Northbound Left turn lane	300	**415**	300	**511**
Northbound Right turn lane	300	166	300	276
Eastbound Left turn lane	150	**177**	150	128
Eastbound Through lane	490	189	490	334
4th St/Baker Ave				
Eastbound Left turn lane[3]	100	73	100	**150**
Eastbound Through lane	694	130	694	293

Notes: **BOLD** indicates inadequate queuing distance.
[1] An additional 260' of queuing space is available in the two-way left-turn lane.
[2] An additional 340' of queuing space is available in the two-way left-turn lane.
[3] An additional 390' of queuing space is available in the two-way left-turn lane.

Table 30: Year 2040 Alternative 1 Intersection Queue Lengths

Intersection	Space Provided (Ft)	AM Peak Hour Queue Length 95th %ile (Ft)	PM Peak Hour Queue Length 95th %ile (Ft)
4th St/Grove Ave			
Westbound Left Turn lane	150	90	77
Westbound Through lane	1,168	151[1]	166[1]
Southbound Left Turn lane	160	**201**	158
Southbound Through lane	604	165	207
4th St/I-10 EB Ramps			
Westbound Left Turn lane	188	47	136
Westbound Through lane	392	54	55
Eastbound Through lane	413	100	228
Southbound Left Turn lane	160	143	**249**
Southbound Right Turn lane	320	186	81
4th St/I-10 WB Ramps			
Northbound Left Turn lane	200	175	**258**
Northbound Right turn lane	200	82	157
Westbound Through lane	666	112	243
Eastbound Left Turn lane	172	67	91
Eastbound Through lane	412	71	89
4th St/Baker Ave			
Eastbound Left Turn lane	184	92	**213**
Eastbound Through lane	588	111	175

Notes: **BOLD** indicates inadequate queuing distance.
[1] Queue length exceeds adjacent left-turn pocket storage length.

Table 31: Year 2040 Alternative 2 Intersection Queue Lengths

Intersection	Space Provided (Ft)	AM Peak Hour Queue Length 95th %ile (Ft)	PM Peak Hour Queue Length 95th %ile (Ft)
I-10 Westbound Ramps/Grove Ave			
Northbound Left turn lane	367	194	194
Northbound Through lane	524	7	7
Westbound Left turn lane	800	352	276
Westbound Through/Left turn lane	800	337	266
Westbound Right turn lane	183	132	182
I-10 Eastbound Ramps/Grove Ave			
Northbound Through lane	590	116	137
Northbound Right turn lane	186	3	47
Southbound Left turn lane	279	174	111
Southbound Through lane	505	18	0
Eastbound Left turn lane	1,000	92	62
Eastbound Through/Right turn lane	400	277	342
4th St/Grove Ave			
Southbound Left turn lane	160	110	158
Southbound Through lane	568	229[1]	189[1]
Southbound Right turn lane	140	72	**181**

[1] Queue length exceeds adjacent turn pocket storage lengths.

Table 32: Year 2040 Alternative 3 Intersection Queue Lengths

Intersection	Space Provided (Ft)	AM Peak Hour Queue Length 95th %ile (Ft)	PM Peak Hour Queue Length 95th %ile (Ft)
I-10 Westbound Ramps/Grove Ave			
Northbound Through lane	531	75	40
Northbound Right turn lane	531	61	0
Westbound Left turn lane	1,130	252	197
Westbound Through/Left turn lane	1,130	246	193
Westbound Right turn lane	128	123	**145**
I-10 Eastbound Ramps/Grove Ave			
Northbound Through lane	633	153	314[1]
Northbound Right turn lane	190	65	79
Southbound Through lane	456	118	147
Eastbound Left turn lane	1,136	67	34
Eastbound Through/Right turn lane	163	**196**	**192**
4th St/Grove Ave			
Southbound Left turn lane	160	130	**178**
Southbound Through lane	567	187[1]	243[1]
Southbound Right turn lane	140	90	**194**

[1] Queue length exceeds adjacent turn pocket storage lengths.

Table 33: Year 2040 No Build Freeway Mainline Levels of Service

Freeway Segment	AM Peak Hour				PM Peak Hour			
	Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS	Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS
Eastbound								
Freeway Mainline between Euclid Ave & 4th St	**13,781**	-	**> 45.0**	**F**	**13,916**	-	**> 45.0**	**F**
Freeway Mainline between 4th St & Vineyard Ave	**13,682**	-	**> 45.0**	**F**	**13,871**	-	**> 45.0**	**F**
Westbound								
Freeway Mainline between 4th St & Vineyard Ave	**10,943**	-	**> 45.0**	**F**	**14,259**	-	**> 45.0**	**F**
Freeway Mainline between Euclid Ave & 4th St	**11,288**	-	**> 45.0**	**F**	**14,481**	-	**> 45.0**	**F**

Notes:

[1] Average passenger-car speed. **BOLD** indicates unsatisfactory level of service.

Level of Service (LOS) criteria are provided in the *Highway Capacity Manual*, and are based on density.

Table 34: Year 2040 Alternative 2 Freeway Mainline Levels of Service

Freeway Segment	AM Peak Hour				PM Peak Hour			
	Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS	Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS
Eastbound								
Freeway Mainline between Euclid Ave & Grove Ave	**13,637**	-	**> 45.0**	**F**	**12,464**	-	**> 45.0**	**F**
Freeway Mainline between Grove Ave & Vineyard Ave	**14,153**	-	**> 45.0**	**F**	**12,715**	-	**> 45.0**	**F**
Westbound								
Freeway Mainline between Grove Ave & Vineyard Ave	**11,499**	-	**> 45.0**	**F**	**13,529**	-	**> 45.0**	**F**
Freeway Mainline between Euclid Ave & Grove Ave	**11,255**	-	**> 45.0**	**F**	**13,296**	-	**> 45.0**	**F**

Notes:
[1] Average passenger-car speed. **BOLD** indicates unsatisfactory level of service.
Level of Service (LOS) criteria are provided in the *Highway Capacity Manual*, and are based on density.

Table 35: Year 2040 No Build Freeway Ramp Levels of Service

Ramp	AM Peak Hour				PM Peak Hour			
	Ramp Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS	Ramp Volume	Speed[1] (mph)	Density (pc/mi/ln)	LOS
Eastbound								
Euclid Ave Off Ramp	**1,705**	-	-	**F***	**1,286**	-	-	**F***
Euclid Ave On Ramp	**1,108**	-	-	**F***	**1,453**	-	-	**F***
4th St Off Ramp	**1,130**	-	-	**F***	**1,031**	-	-	**F***
4th St On Ramp	**1,031**	-	-	**F***	**986**	-	-	**F***
Vineyard Ave Off Ramp	**2,015**	-	-	**F***	**1,423**	-	-	**F***
Vineyard Ave On Ramp[2]	-	-	-	-	-	-	-	-
Westbound								
Vineyard Ave Off Ramp[2]	-	-	-	-	-	-	-	-
Vineyard Ave Loop On Ramp	**252**	-	-	**F***	**484**	-	-	**F***
Vineyard Ave Direct On Ramp	**937**	-	-	**F***	**1,622**	-	-	**F***
4th St Off Ramp	**529**	-	-	**F***	**649**	-	-	**F***
4th St On Ramp	**874**	-	-	**F***	**871**	-	-	**F***
7th St Off Ramp	**1,292**	-	-	**F***	**1,612**	-	-	**F***
Euclid Ave Loop On Ramp	**368**	-	-	**F***	**410**	-	-	**F***
Euclid Ave Direct On Ramp	**718**	-	-	**F***	**581**	-	-	**F***

Notes:

[1] Speed in ramp influence area. All ramps are a single lane at the gore point.

[2] Part of weaving segment.

Level of Service (LOS) criteria are provided in the *Highway Capacity Manual*, and are based on density. **BOLD** indicates unsatisfactory level of service.

* Freeway is over capacity. Speed and Density are not predicted when freeway is over capacity, per *HCM*.

Table 36: Year 2040 No Build Freeway Weaving Levels of Service

Weave Segment	AM Peak Hour				PM Peak Hour			
	Non-weaving Volume	Weaving Volume	Density (pc/mi/ln)	LOS	Non-weaving Volume	Weaving Volume	Density (pc/mi/ln)	LOS
Eastbound								
Vineyard Ave to Archibald Ave	**10,245**	**2,537**	**61.6**	**F**	**10,545**	**2,788**	**58.7**	**F**
Westbound								
Archibald Ave to Vineyard Ave	**8,288**	**2,429**	**50.9**	**F**	**9,536**	**3,914**	**74.4**	**F**

Notes:
Level of Service (LOS) criteria are provided in the *Highway Capacity Manual*, and are based on density.

ATTACHMENT 6

TASAS TABLE B

California Department of Transportation
Table B - Selective Accident Rate Calculation

Location Description	Rate Group (RUS)	No. of Accidents / Significance: Tot	Fat	Inj	F+I	Multi Veh	Wet	Dark	Pers Kld Inj	ADT Main X-St	Total MV+ or MVM	Accident Rates Actual: Fat	F+I	Average: Tot	Fat	F+I	Tot
08 SBD 010 003.000 - 08 SBD 010 006.300 0001-0001 2006-10-01 2009-09-30 *36 mo.*	3.301 MI H U	679	4	222	226	582	42	204	8 316	245.1	886.67	0.005	.25	.77	0.012	.37	1.19
08 SBD 010 003.000 - 08 SBD 010 006.300 0001-0002 2006-10-01 2009-09-30 *36 mo.*	3.301 MI H EAST U	381	3	128	131	322	21	137	7 184	122.5	443.33	0.007	.30	.86	0.012	.36	1.18
08 SBD 010 003.000 - 08 SBD 010 006.300 0001-0003 2006-10-01 2009-09-30 *36 mo.*	3.301 MI H WEST U	298	1	94	95	260	21	67	1 132	122.5	443.33	0.002	.21	.67	0.012	.36	1.18
08 SBD 010 003.326 010/WB ON FR SB 83-EUCLID 0001-0004 2006-10-01 2009-09-30 *36 mo.*	R 64 U	4	0	2	2	3	0	0	0 6	9.0 .0	9.86 +	0.000	.20	.41	0.003	.11	.35
08 SBD 010 003.352 010/EBOFF TO 83-EUCLID 0001-0004 2006-10-01 2009-09-30 *36 mo.*	R 54 U	20	0	7	7	18	1	8	0 8	14.0 .0	15.34 +	0.000	.46	1.30	0.002	.31	1.00
08 SBD 010 003.535 010/WB ON FR NB 83-EUCLID 0001-0004 2006-10-01 2009-09-30 *36 mo.*	R 72 U	5	0	2	2	5	2 H95	0	0 3	5.1 .0	5.64 +	0.000	.35	.89	0.003	.19	.65
08 SBD 010 003.607 010/EB ON FR 83-EUCLID 0001-0004 2006-10-01 2009-09-30 *36 mo.*	R 56 U	4	0	0	0	4	0	1	0 0	10.9 .0	11.93 +	0.000	.00	.34	0.001	.19	.60
08 SBD 010 003.685 010/WBOFF TO 83-EUCLID 0001-0004 2006-10-01 2009-09-30 *36 mo.*	R 26 U	13	0	3	3	8	0	2	0 4	10.6 .0	11.62 +	0.000	.26	1.12	0.004	.28	.95
08 SBD 010 005.082 010/EB OFF TO FOURTH ST 0001-0004 2006-10-01 2009-09-30 *36 mo.*	R 10 U	26 H99	0	9 H97	9 H97	23	1	10 H97	0 15	8.7 .0	9.54 +	0.000	.94	2.73	0.004	.42	1.20
08 SBD 010 005.166 010/WB ON FM FOURTH ST 0001-0004 2006-10-01 2009-09-30 *36 mo.*	R 12 U	18 H99	0	8 H99	8 H99	14	2	8 H97	0 10	8.5 .0	9.32 +	0.000	.86	1.93	0.002	.26	.75
08 SBD 010 005.342 010/EB ON FR FOURTH ST 0001-0004 2006-10-01 2009-09-30 *36 mo.*	R 12 U	10 H92	0	5 H92	5 H92	9	4 H99	4	0 6	6.8 .0	7.41 +	0.000	.68	1.35	0.002	.26	.75
08 SBD 010 005.391 010/WB OFF TO FOURTH ST 0001-0004 2006-10-01 2009-09-30 *36 mo.*	R 10 U	18 H97	1	10 H99	11 H99	17	0	10 H99	1 19	6.9 .0	7.54 +	0.133	1.46	2.39	0.004	.42	1.20

Accident Rates expressed as: **# of accidents / Million vehicle miles**

+ denotes that **Million Vehicles** (MV) used in accident rates instead (for intersections and ramps).

For Ramps RUS only considers R(Rural) U(Urban)

California Department of Transportation
Table B - Selective Accident Rate Calculation

Location Description				Rate Group (RUS)	No. of Accidents / Significance							Pers Kld Inj	ADT Main X-St	Total MV+ or MVM	Accident Rates Actual		Accident Rates Average			
					Tot	Fat	Inj	F+I	Multi Veh	Wet	Dark				Fat	F+I	Tot	Fat	F+I	Tot
08 SBD 010 005.978 010/EB OFF TO VINEYARD AVE 0001-0004	2006-10-01	2009-09-30	*36 mo.*	R 10 U	13	0	3	3	11	2	7	0 3	12.1 .0	13.22 +	0.000	.23	.98	0.004	.42	1.20
08 SBD 010 006.024 010/WB ON FR SB VINEYARD 0001-0004	2006-10-01	2009-09-30	*36 mo.*	R 20 U	3	0	1	1	3	0	1	0 1	5.6 .0	6.14 +	0.000	.16	.49	0.003	.20	.65
08 SBD 010 006.126 010/WB ON FR NB VINEYARD 0001-0004	2006-10-01	2009-09-30	*36 mo.*	R 40 U	3	0	1	1	3	0	0	0 1	3.1 .0	3.42 +	0.000	.29	.88	0.004	.20	.70
08 SBD 010 006.286 010/WB OFF TO VINEYARD AVE 0001-0004	2006-10-01	2009-09-30	*36 mo.*	R 10 U	16	0	7	7	12	2	9	0 9	56.2 .0	61.62 +	0.000	.11	.26	0.004	.42	1.20
08 SBD 010 006.299 010/EB ON FROM VINEYARD AVE 0001-0004	2006-10-01	2009-09-30	*36 mo.*	R 12 U	15 **H97**	0	5	5	14	3 **H95**	5	0 9	10.0 .0	10.96 +	0.000	.46	1.37	0.002	.26	.75

Accident Rates expressed as: **# of accidents / Million vehicle miles**

+ denotes that **Million Vehicles** (MV) used in accident rates instead (for intersections and ramps).

For Ramps RUS only considers R(Rural) U(Urban)

ATTACHMENT 7

PROPOSED IMPROVEMENTS

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

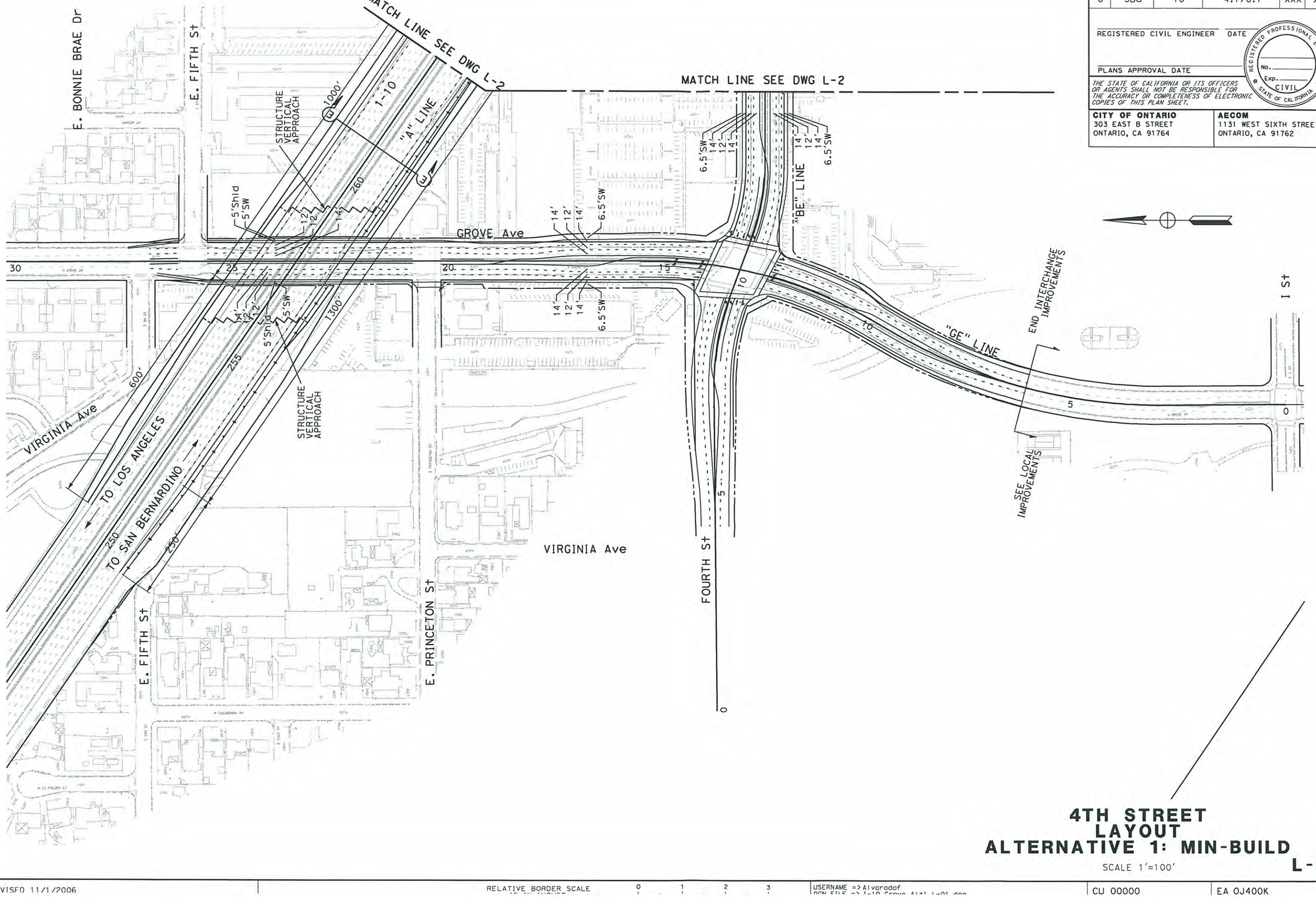
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



4TH STREET LAYOUT ALTERNATIVE 1: MIN-BUILD

SCALE 1'=100'

L-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

DESIGN OVERSIGHT: NASSIM ELIAS

CALCULATED-DESIGNED BY

CHECKED BY

REVISED BY | DATE REVISED

LAST REVISION | DATE PLOTTED =>

BORDER LAST REVISED 11/1/2006

RELATIVE BORDER SCALE 0 1 2 3

USERNAME =>Alvaradof

CU 00000

EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

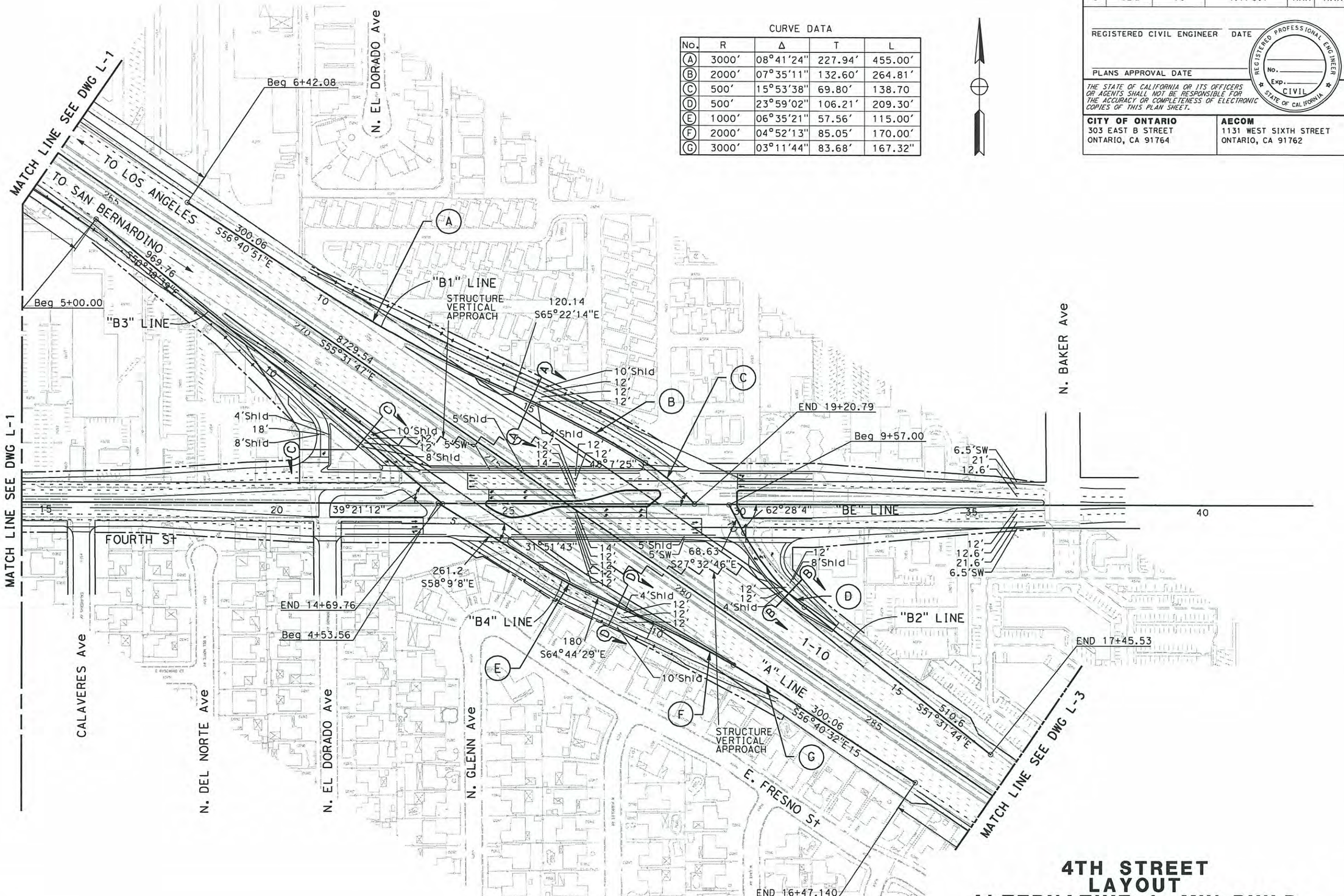
REGISTERED PROFESSIONAL ENGINEER — No. Exp. CIVIL — STATE OF CALIFORNIA

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762

CURVE DATA

No.	R	Δ	T	L
A	3000′	08°41′24"	227.94′	455.00′
B	2000′	07°35′11"	132.60′	264.81′
C	500′	15°53′38"	69.80′	138.70
D	500′	23°59′02"	106.21′	209.30′
E	1000′	06°35′21"	57.56′	115.00′
F	2000′	04°52′13"	85.05′	170.00′
G	3000′	03°11′44"	83.68′	167.32"



4TH STREET LAYOUT ALTERNATIVE 1: MIN-BUILD

SCALE 1′=100′

L-2

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

DESIGN OVERSIGHT: NASSIM ELIAS

CALCULATED-DESIGNED BY | CHECKED BY

REVISED BY | DATE REVISED

LAST REVISION | DATE PLOTTED => 9/16/2010

BORDER LAST REVISED 11/1/2006

RELATIVE BORDER SCALE 0 1 2 3

USERNAME => Alvaradof

CU 00000

EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

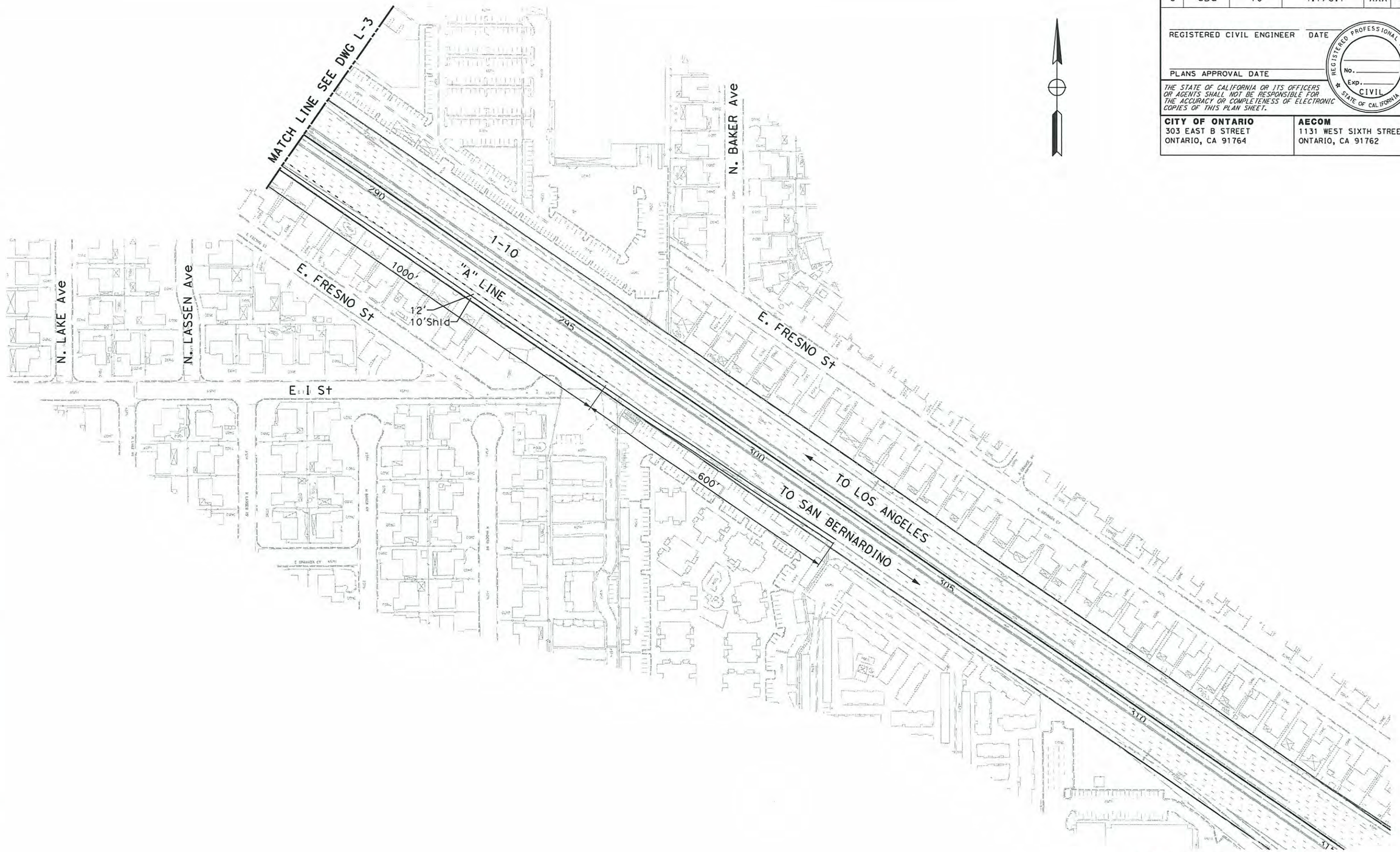
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



4TH STREET LAYOUT ALTERNATIVE 1: MIN-BUILD

SCALE 1'=100'

L-3

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

DESIGN OVERSIGHT
NASSIM ELIAS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

LAST REVISION | DATE PLOTTED => 9/15/2010

BORDER LAST REVISED 11/1/2006

RELATIVE BORDER SCALE 0 1 2 3

USERNAME => Alvaradof

CU 00000

EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

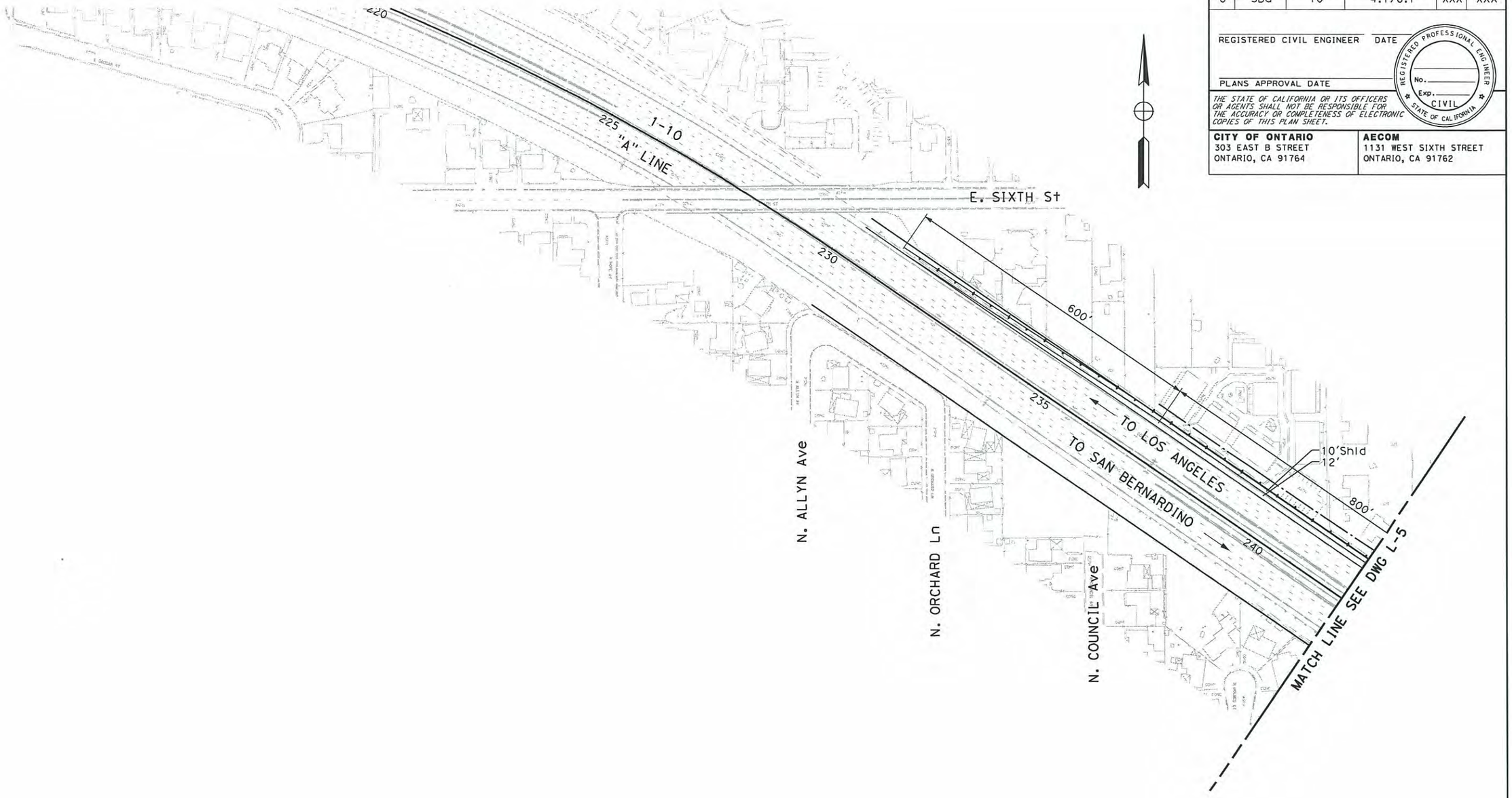
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



GROVE Ave
LAYOUT
ALTERNATIVE 2: DIAMOND

SCALE 1'=100'

L-4

REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY

CHECKED BY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

DESIGN OVERSIGHT

NASSIM ELIAS

LAST REVISION | DATE PLOTTED => 9/15/2010

BORDER LAST REVISED 11/1/2006 | RELATIVE BORDER SCALE 0 1 2 3 | USERNAME => Alvaradof | CU 00000 | EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

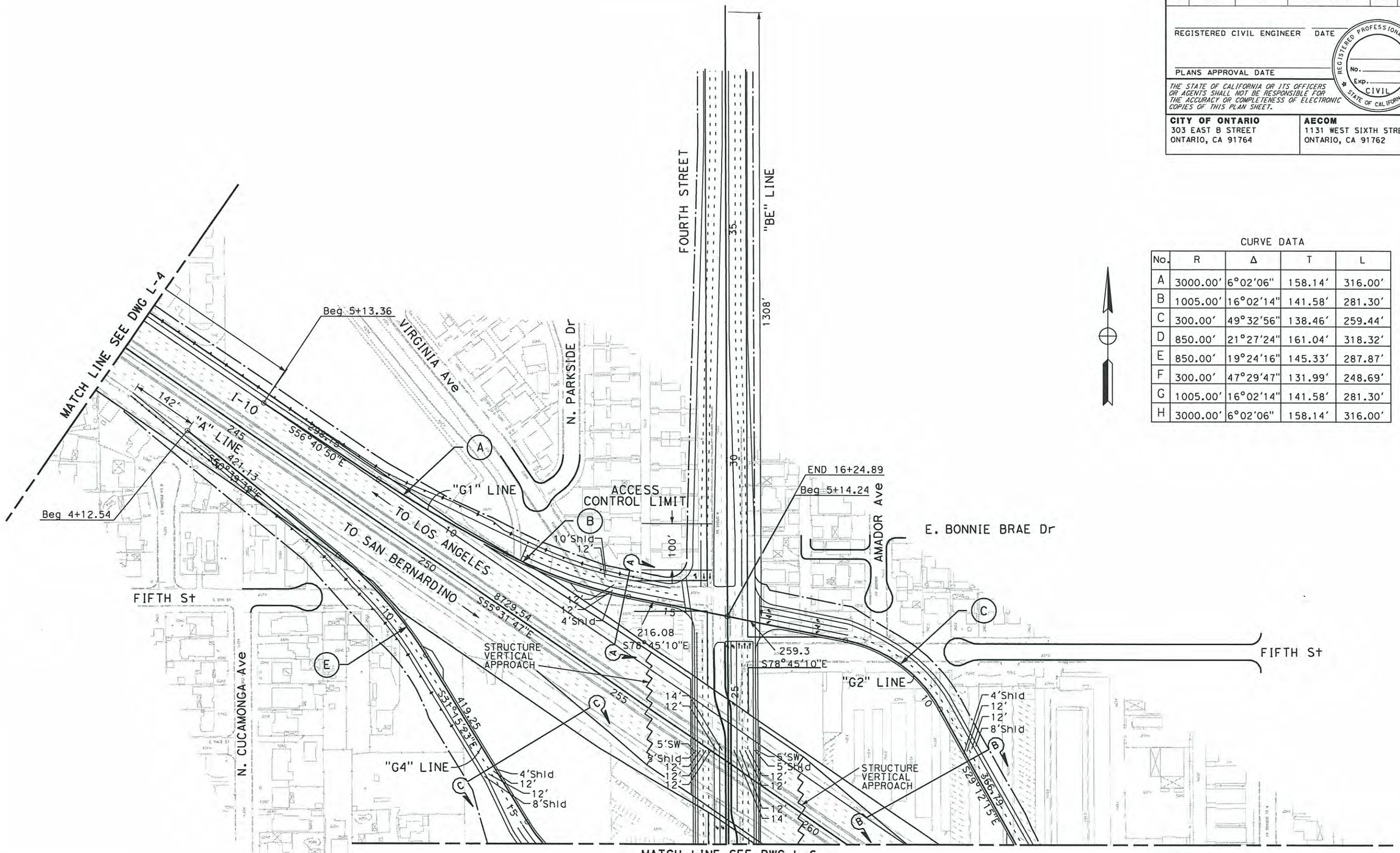
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762

CURVE DATA

No.	R	Δ	T	L
A	3000.00'	6°02'06"	158.14'	316.00'
B	1005.00'	16°02'14"	141.58'	281.30'
C	300.00'	49°32'56"	138.46'	259.44'
D	850.00'	21°27'24"	161.04'	318.32'
E	850.00'	19°24'16"	145.33'	287.87'
F	300.00'	47°29'47"	131.99'	248.69'
G	1005.00'	16°02'14"	141.58'	281.30'
H	3000.00'	6°02'06"	158.14'	316.00'



GROVE Ave
LAYOUT
ALTERNATIVE 2: DIAMOND

SCALE 1'=100'

L-5

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

DESIGN OVERSIGHT: NASSIM ELIAS

CALCULATED-DESIGNED BY

CHECKED BY

DATE REVISED	REVISED BY

LAST REVISION | DATE PLOTTED => 9/16/2010

BORDER LAST REVISED 11/1/2006

RELATIVE BORDER SCALE 0 1 2 3

USERNAME => Alvaradof

CU 00000

EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

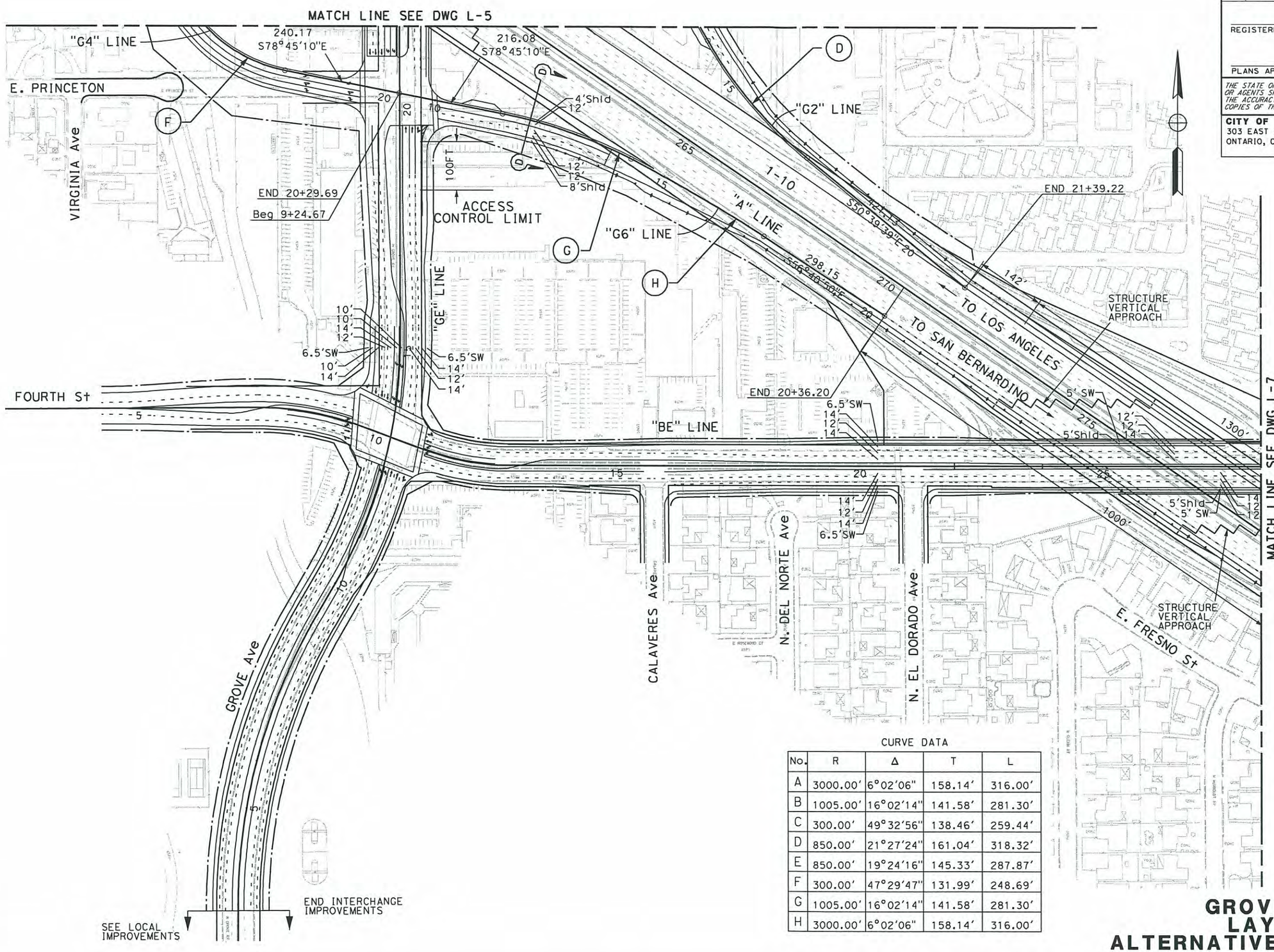
PLANS APPROVAL DATE

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

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

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



CURVE DATA

No.	R	Δ	T	L
A	3000.00′	6°02′06"	158.14′	316.00′
B	1005.00′	16°02′14"	141.58′	281.30′
C	300.00′	49°32′56"	138.46′	259.44′
D	850.00′	21°27′24"	161.04′	318.32′
E	850.00′	19°24′16"	145.33′	287.87′
F	300.00′	47°29′47"	131.99′	248.69′
G	1005.00′	16°02′14"	141.58′	281.30′
H	3000.00′	6°02′06"	158.14′	316.00′

GROVE Ave LAYOUT ALTERNATIVE 2: DIAMOND

SCALE 1′=100′

L-6

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

DESIGN OVERSIGHT: NASSIM ELIAS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION | DATE PLOTTED => 9/16/2010

BORDER LAST REVISED 11/1/2006 | RELATIVE BORDER SCALE 0 1 2 3 | USERNAME => Alvaradof | CU 00000 | EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

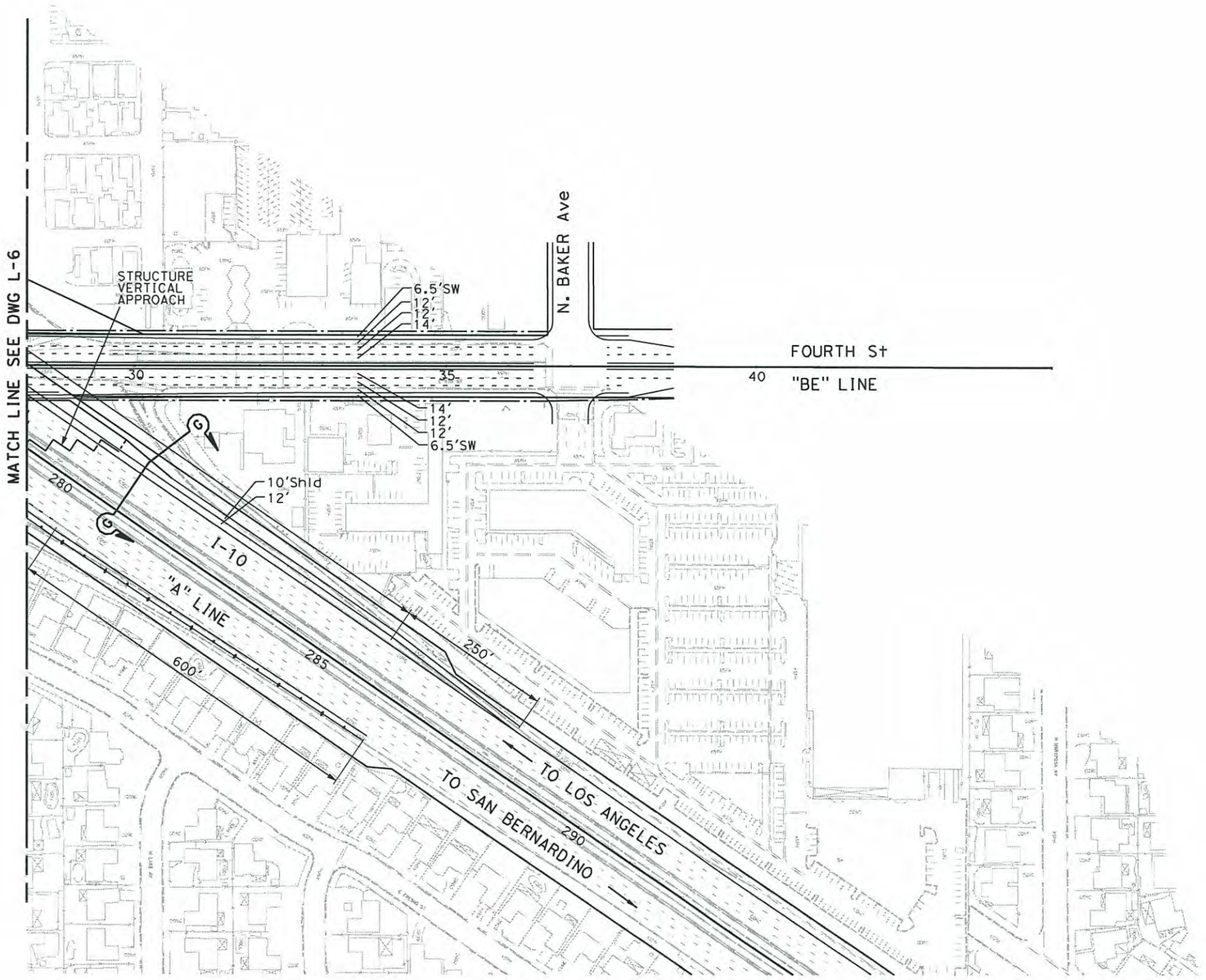
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



GROVE Ave
LAYOUT
ALTERNATIVE 2: DIAMOND

SCALE 1'=100'

L-7

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

DESIGN OVERSIGHT
NASSIM ELIAS

CALCULATED-DESIGNED BY

CHECKED BY

REVISED BY	DATE REVISED

LAST REVISION DATE PLOTTED => 9/16/2010

BORDER LAST REVISED 11/1/2006

RELATIVE BORDER SCALE 0 1 2 3

USERNAME => Alvaradof

CU 00000

EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

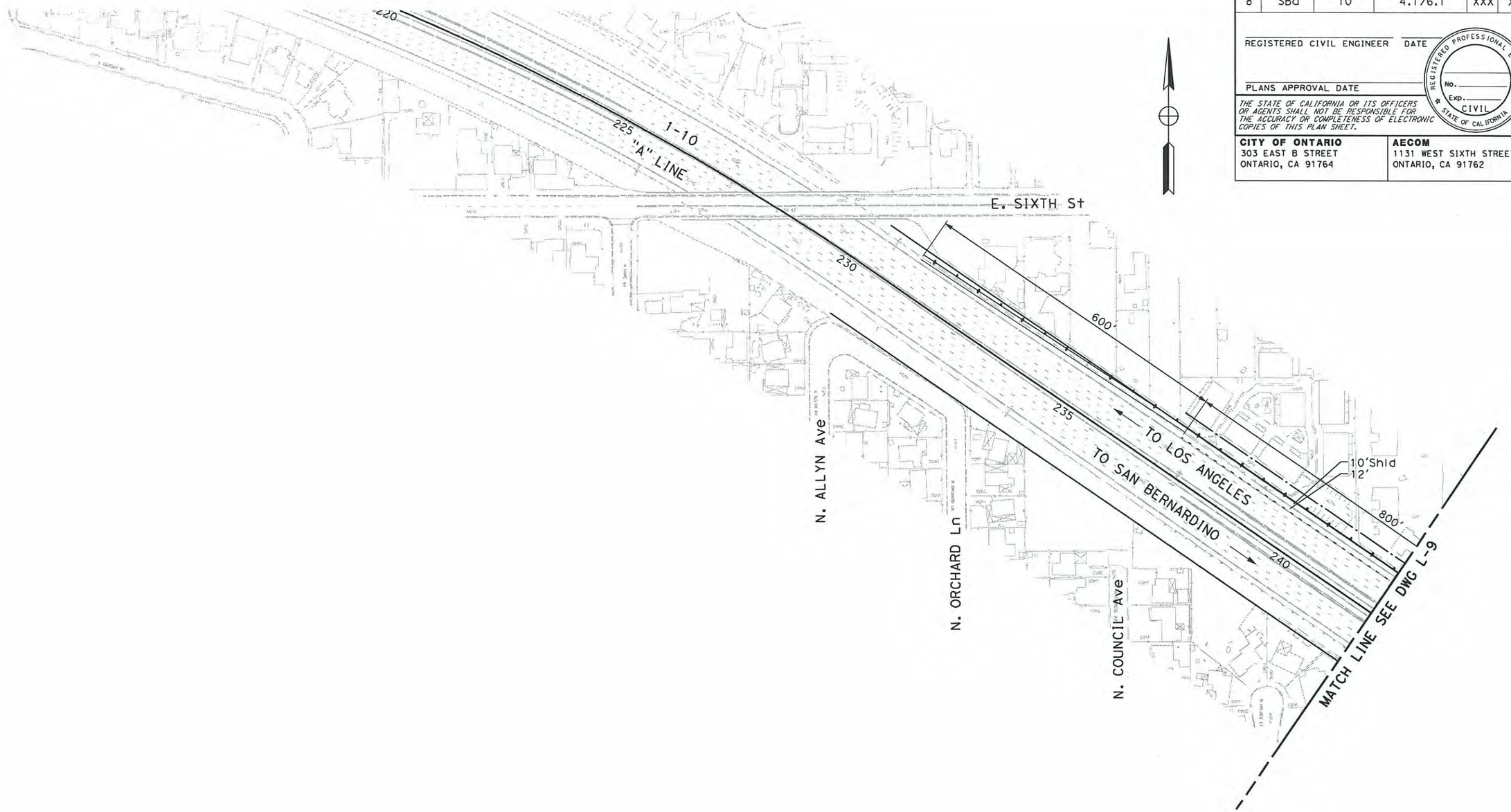
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



GROVE Ave
LAYOUT
ALTERNATIVE 3: PARCLO (L-9)

SCALE 1'=100'

L-8

REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY

CHECKED BY

DESIGN OVERSIGHT
NASSIM ELIAS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

LAST REVISION | DATE PLOTTED => 9/15/2010

BORDER LAST REVISED 11/1/2006 | RELATIVE BORDER SCALE 0 1 2 3 | USERNAME => Alvaradof | CU 00000 | EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

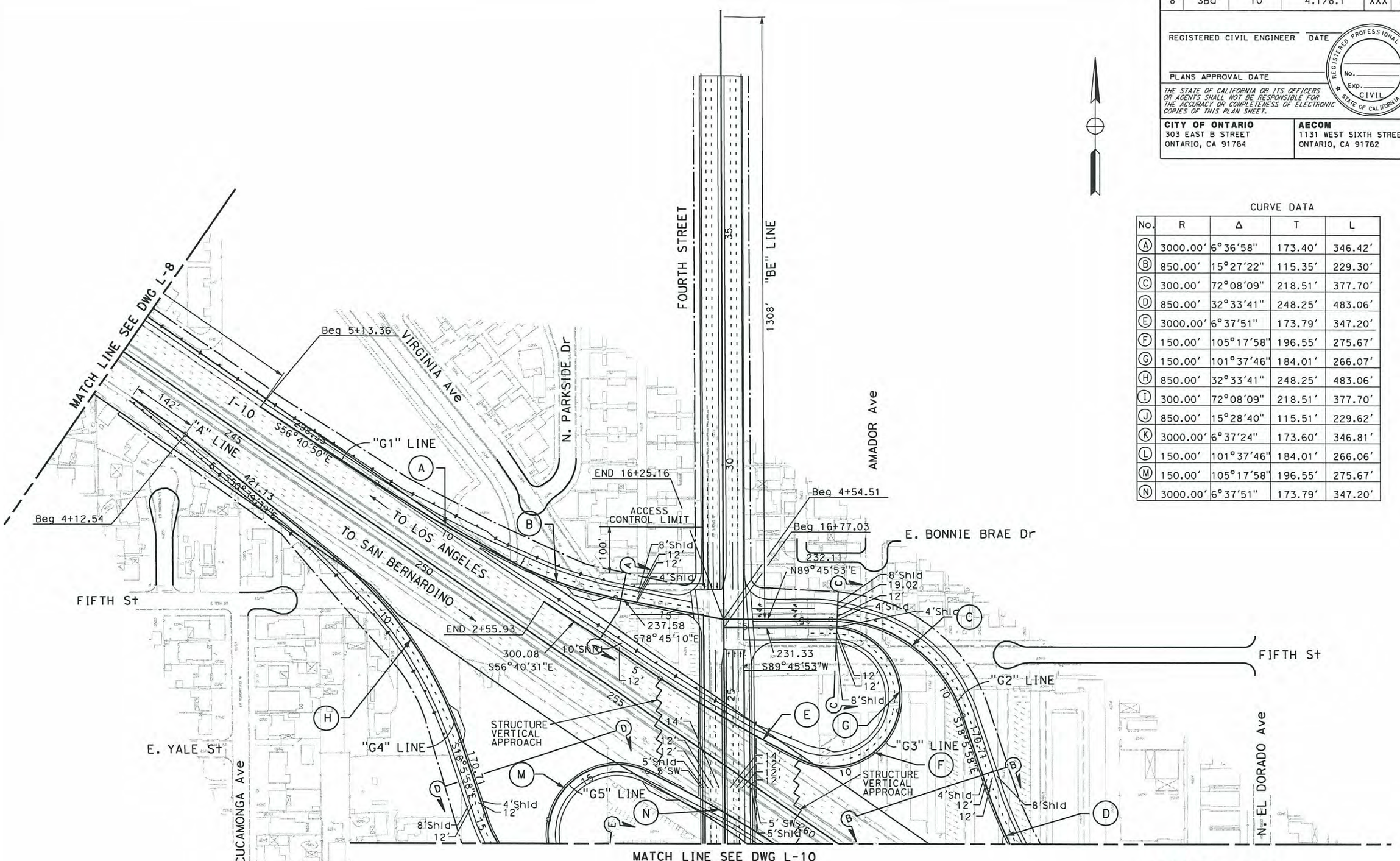
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762

CURVE DATA

No.	R	Δ	T	L
Ⓐ	3000.00′	6°36′58"	173.40′	346.42′
Ⓑ	850.00′	15°27′22"	115.35′	229.30′
Ⓒ	300.00′	72°08′09"	218.51′	377.70′
Ⓓ	850.00′	32°33′41"	248.25′	483.06′
Ⓔ	3000.00′	6°37′51"	173.79′	347.20′
Ⓕ	150.00′	105°17′58"	196.55′	275.67′
Ⓖ	150.00′	101°37′46"	184.01′	266.07′
Ⓗ	850.00′	32°33′41"	248.25′	483.06′
Ⓘ	300.00′	72°08′09"	218.51′	377.70′
Ⓙ	850.00′	15°28′40"	115.51′	229.62′
Ⓚ	3000.00′	6°37′24"	173.60′	346.81′
Ⓛ	150.00′	101°37′46"	184.01′	266.06′
Ⓜ	150.00′	105°17′58"	196.55′	275.67′
Ⓝ	3000.00′	6°37′51"	173.79′	347.20′



GROVE Ave
LAYOUT
ALTERNATIVE 3: PARCLO (L-9)

SCALE 1′=100′

L-9

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

DESIGN OVERSIGHT: NASSIM ELIAS

CALCULATED-DESIGNED BY

CHECKED BY

DATE REVISED	REVISED BY

LAST REVISION | DATE PLOTTED => 9/16/2010

BORDER LAST REVISED 11/1/2006

RELATIVE BORDER SCALE 0 1 2 3

USERNAME => Alvaradof
DGN FILE => I-10 Grove Alt3 L-09.dgn

CU 00000

EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762

MATCH LINE SEE DWG L-9

MATCH LINE SEE DWG L-11

"G4" LINE

"G5" LINE

"G2" LINE

"G6" LINE

"A" LINE

"GE" LINE

"BE" LINE

VIRGINIA Ave

FOURTH St

GROVE Ave

CALAVERES Ave

N. DEL NORTE Ave

N. EL DORADO Ave

I-10

TO LOS ANGELES

TO SAN BERNARDINO

ACCESS CONTROL LIMIT

Beg 9+25.76

Beg 8+74.72

END 20+96.35

END 21+39.22

END 20+39.40

231.21 N89°45'53"E

237.65 S78°46'55"E

300.08 S56°40'51"E

298.15 S56°40'56"E

550°39'39"E

STRUCTURE VERTICAL APPROACH

SEE LOCAL IMPROVEMENTS

END INTERCHANGE IMPROVEMENTS

CURVE DATA

No.	R	Δ	T	L
(A)	3000.00'	6°36'58"	173.40'	346.42'
(B)	850.00'	15°27'22"	115.35'	229.30'
(C)	300.00'	72°08'09"	218.51'	377.70'
(D)	850.00'	32°33'41"	248.25'	483.06'
(E)	3000.00'	6°37'51"	173.79'	347.20'
(F)	150.00'	105°17'58"	196.55'	275.67'
(G)	150.00'	101°37'46"	184.01'	266.07'
(H)	850.00'	32°33'41"	248.25'	483.06'
(I)	300.00'	72°08'09"	218.51'	377.70'
(J)	850.00'	15°28'40"	115.51'	229.62'
(K)	3000.00'	6°37'24"	173.60'	346.81'
(L)	150.00'	101°37'46"	184.01'	266.06'
(M)	150.00'	105°17'58"	196.55'	275.67'
(N)	3000.00'	6°37'51"	173.79'	347.20'

GROVE Ave
LAYOUT
ALTERNATIVE 3: PARCLO (L-9)

SCALE 1'=100'

L-10

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION | DESIGN OVERSIGHT

Caltrans | NASSIM ELIAS

LAST REVISION | DATE PLOTTED => 9/16/2010

BORDER LAST REVISED 11/1/2006 | RELATIVE BORDER SCALE 0 1 2 3 | USERNAME => Alvaradof | CU 00000 | EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

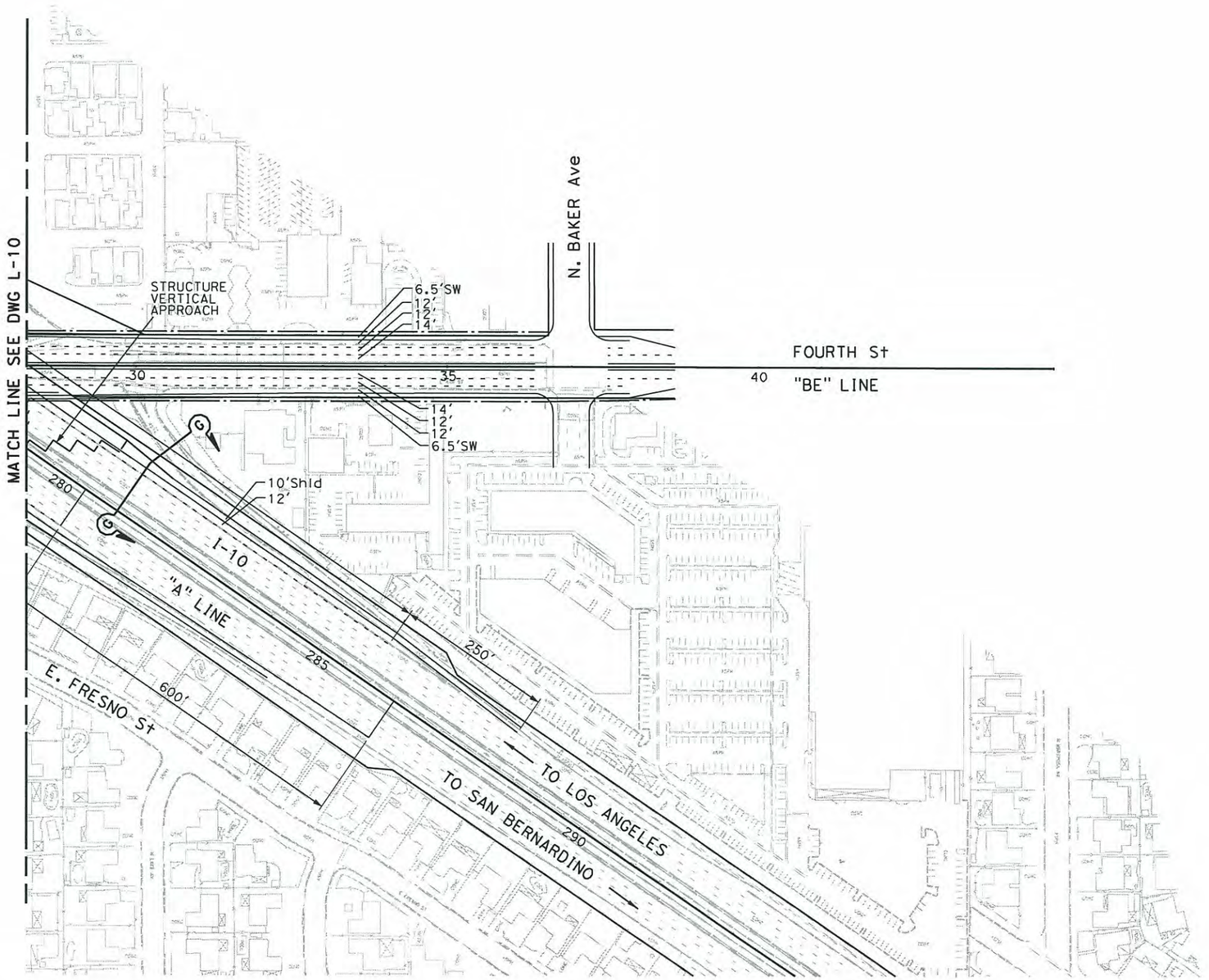
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



GROVE Ave
LAYOUT
ALTERNATIVE 3: PARCLO (L-9)

SCALE 1'=100'

L-11

REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY

CHECKED BY

DESIGN OVERSIGHT
NASSIM ELIAS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

LAST REVISION | DATE PLOTTED => 9/16/2010

BORDER LAST REVISED 11/1/2006

RELATIVE BORDER SCALE 0 1 2 3

USERNAME => Alvaradof

CU 00000

EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

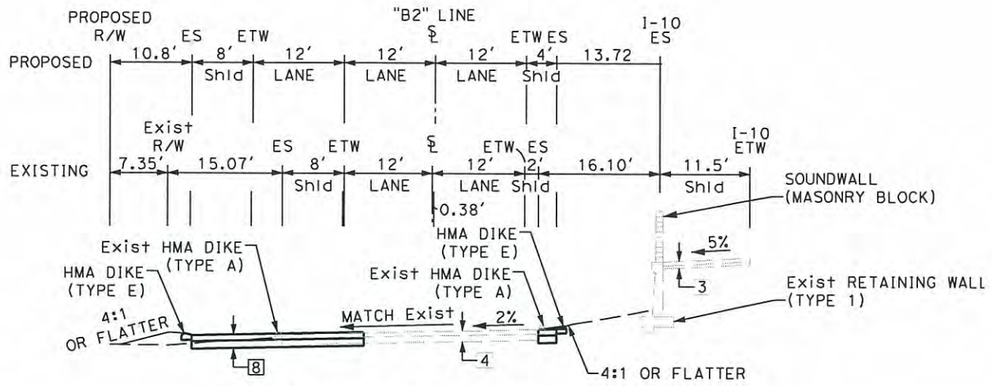
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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

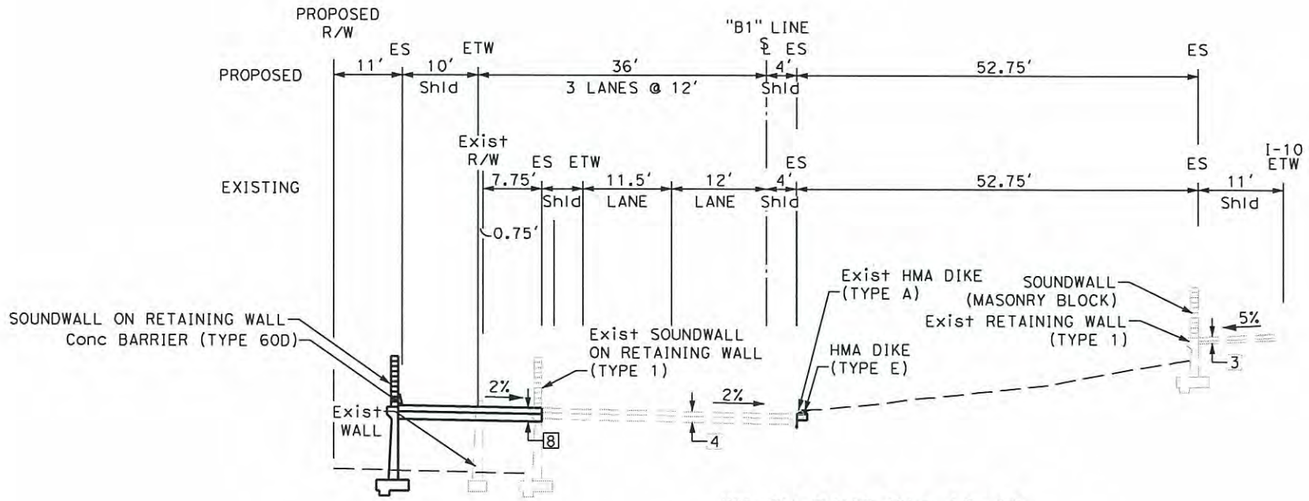
CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



WB OFF-RAMP Sta 11+90

"B2" LINE
SECTION B-B



WB ON-RAMP Sta 15+00

"B1" LINE
SECTION A-A

ABBREVIATIONS

C&G CURB AND GUTTER
ARHM ASPHALT RUBBER HOT MIX
CAB CRUSHED AGGREGATE BASE

EXISTING STRUCTURAL SECTIONS:

[1] 0.85' PCC / 0.50' LCB

[2] 0.75' PCC / 0.45' CTB

[3] 0.50' PCC / 0.35' LCB

[4] 0.60' AC / 0.80' AB

[5] 0.15' ARHM / 0.45' BASE AC / 0.50' CAB

PROPOSED STRUCTURAL SECTIONS:

[6] 0.10' ARHM / 0.80' HMA (TYPE A) / 0.55' CLASS II AB

[7] 1.10' JPCP / 0.50' LCB

[8] 0.50' HMA (TYPE A) / 0.70' CLASS II AB / 1.00' BASEMENT SOIL

[9] 0.85' JPCP / 0.40' LCB

ALTERNATIVE 1: MIN-BUILD

SCALE 1"=10'

X-1

REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY

CHECKED BY

DESIGN OVERSIGHT
NASSIM ELIAS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

LAST REVISION DATE PLOTTED => 9/15/2010

BORDER LAST REVISED 11/1/2006

RELATIVE BORDER SCALE 0 1 2 3

USERNAME => Alvarddof

CU 00000

EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

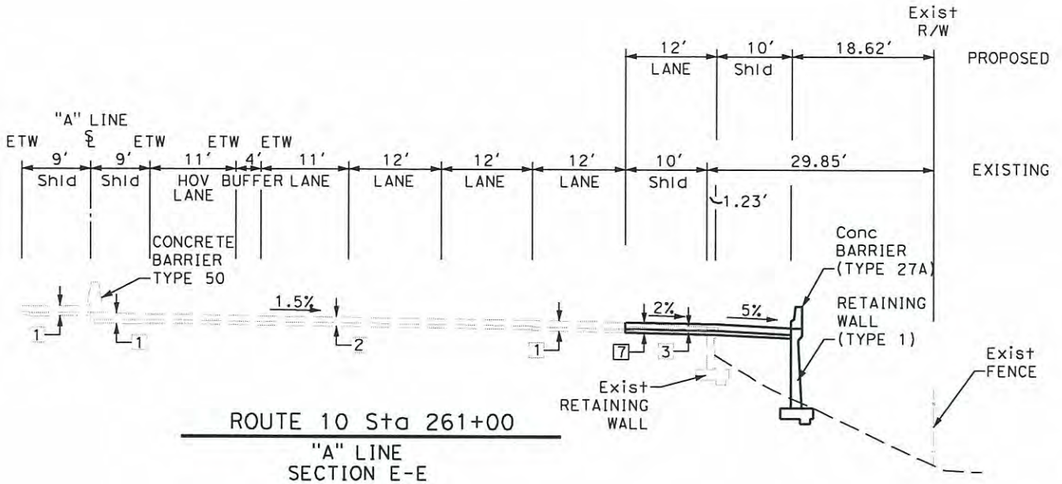
PLANS APPROVAL DATE

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

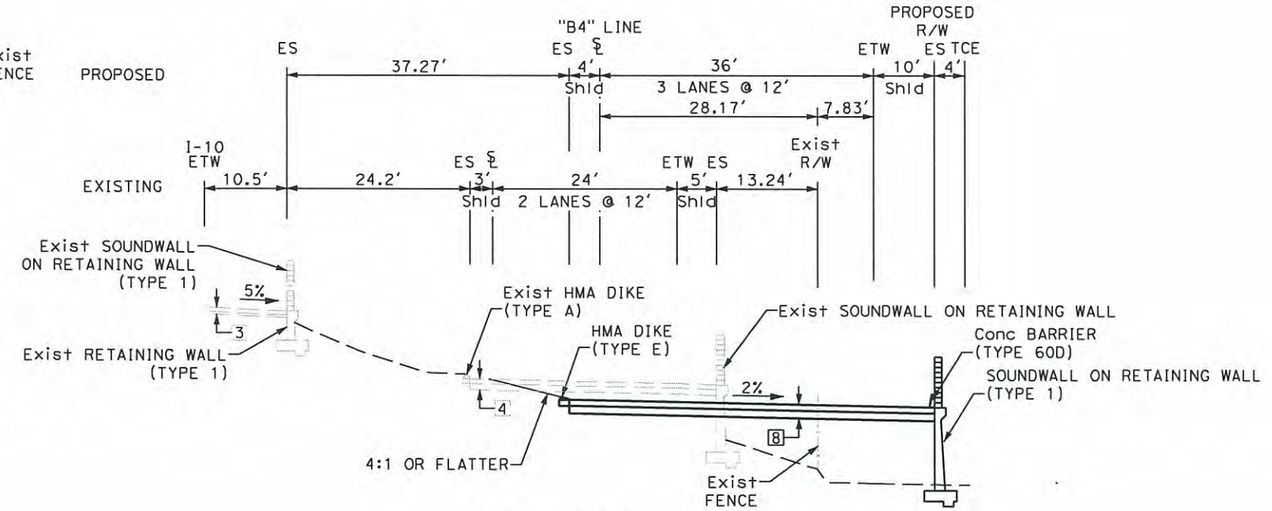
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

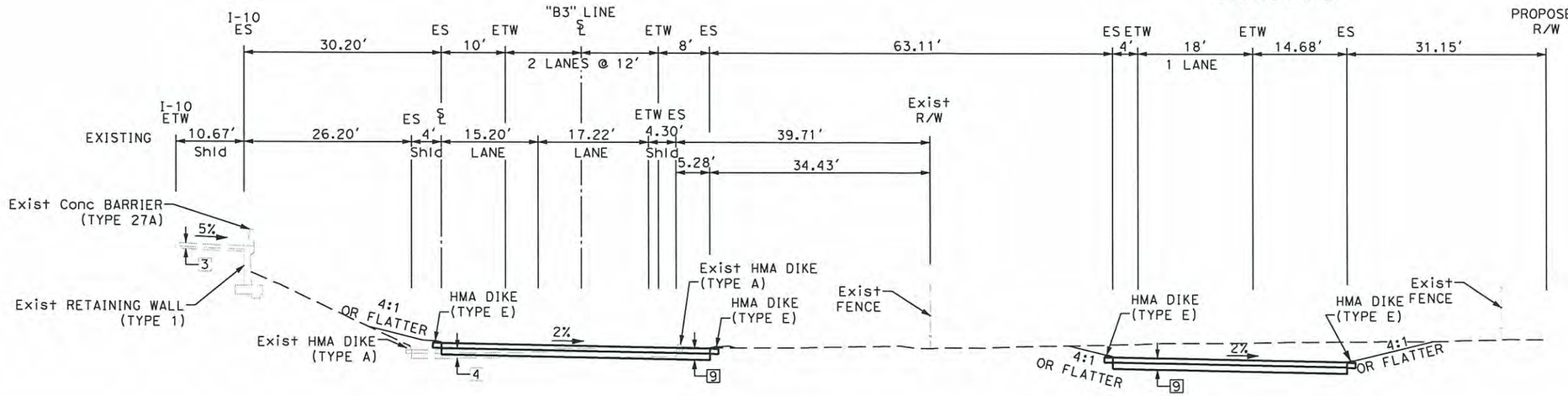
AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



ROUTE 10 Sta 261+00
"A" LINE
SECTION E-E



EB ON-RAMP Sta 9+00
"B4" LINE
SECTION D-D



EB OFF-RAMP Sta 12+50
"B3" LINE
SECTION C-C

ALTERNATIVE 1: MIN-BUILD

SCALE 1"=10'

X-2

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

DESIGN OVERSIGHT: NASSIM ELIAS

CALCULATED-DESIGNED BY | CHECKED BY

REVISED BY | DATE REVISED

LAST REVISION | DATE PLOTTED => 9/15/2010

BORDER LAST REVISED 11/1/2006 | RELATIVE BORDER SCALE 0 1 2 3 | USERNAME => Alvaradof | CU 00000 | EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

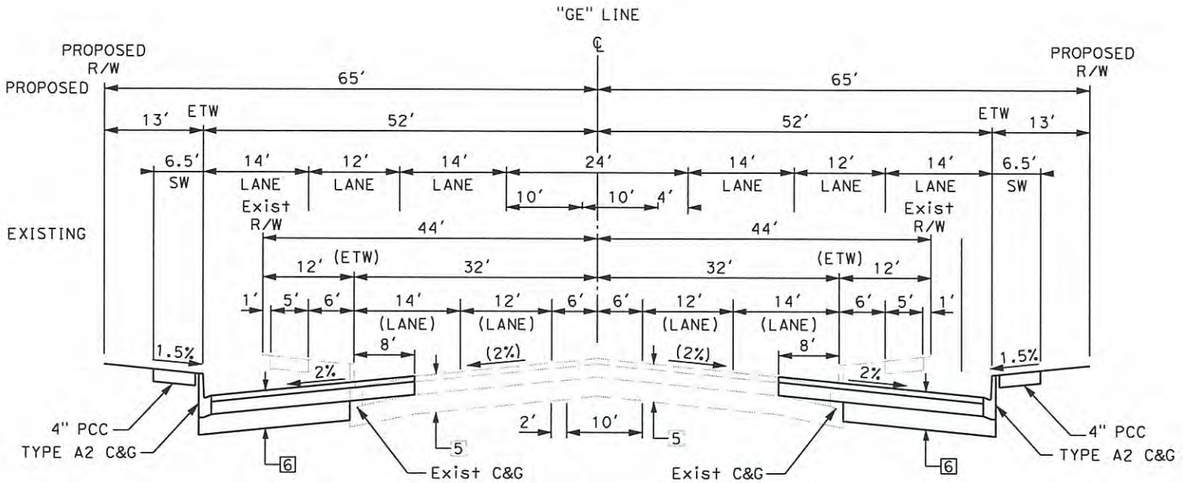
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

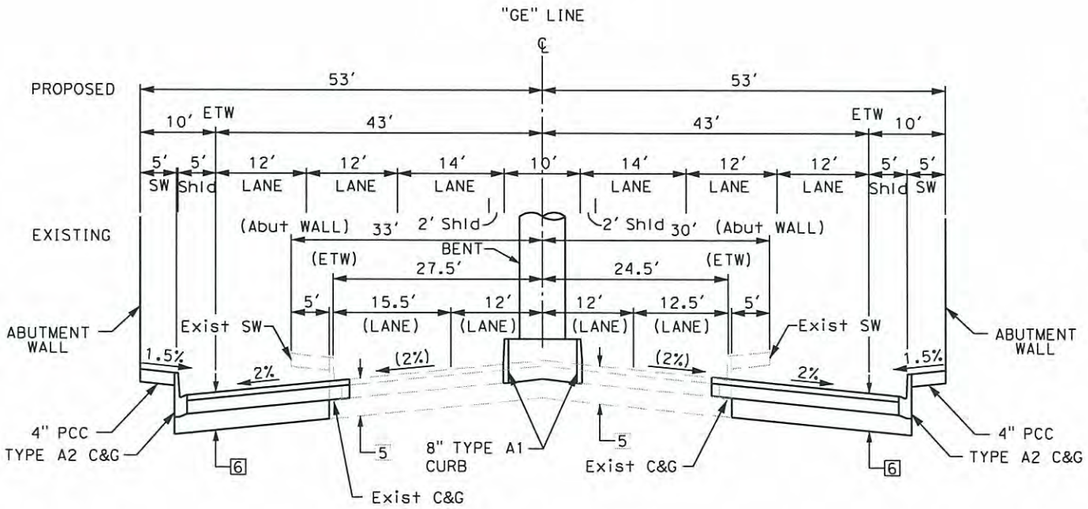
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

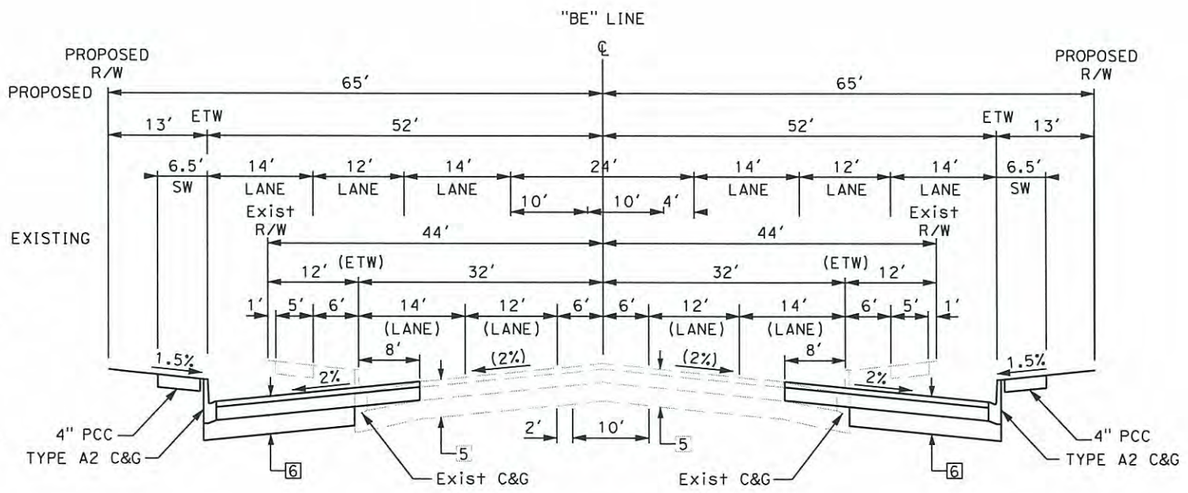
AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



GROVE AVENUE
SOUTH OF I-10 TO 4th STREET



GROVE AVENUE
AT I-10 UC



4th STREET
WEST OF I-10 TO GROVE AVE

ALTERNATIVE 1: MIN-BUILD

NO SCALE

X-3

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

DESIGN OVERSIGHT: NASSIM ELIAS

CALCULATED-DESIGNED BY

CHECKED BY

REVISED BY | DATE REVISED

LAST REVISION | DATE PLOTTED => 9/15/2010

BORDER LAST REVISED 11/1/2006

RELATIVE BORDER SCALE 0 1 2 3

USERNAME => Alvaradof

CU 00000

EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

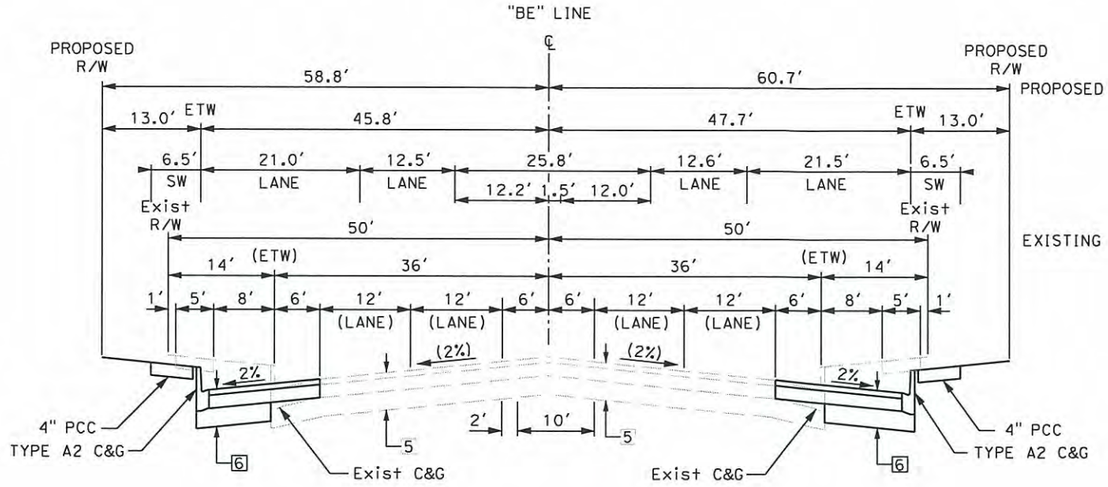
PLANS APPROVAL DATE

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

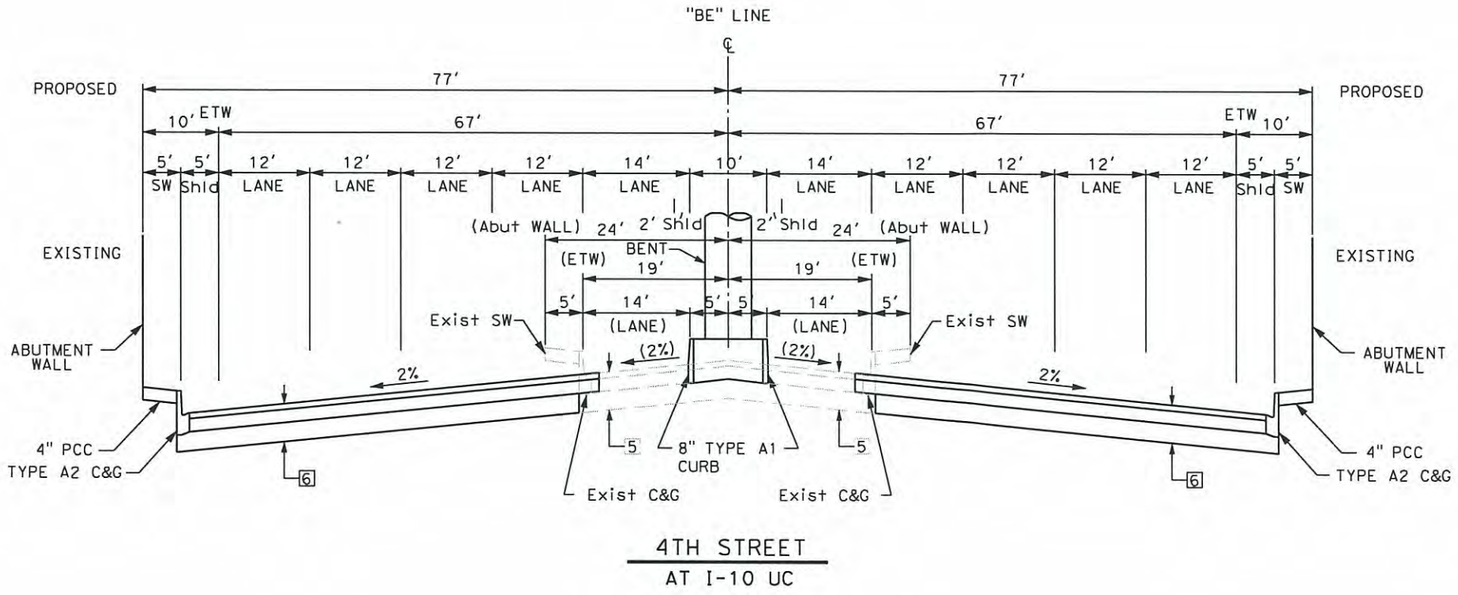
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



4th STREET
EAST OF I-10 TO BAKER AVE



4TH STREET
AT I-10 UC

ALTERNATIVE 1: MIN-BUILD

NO SCALE

X-4

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

DESIGN OVERSIGHT: NASSIM ELIAS

CALCULATED-DESIGNED BY

CHECKED BY

REVISED BY | DATE REVISED

LAST REVISION | DATE PLOTTED => 9/15/2010

BORDER LAST REVISED 11/1/2006

RELATIVE BORDER SCALE 0 1 2 3

USERNAME => Alvaradof

CU 00000

EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

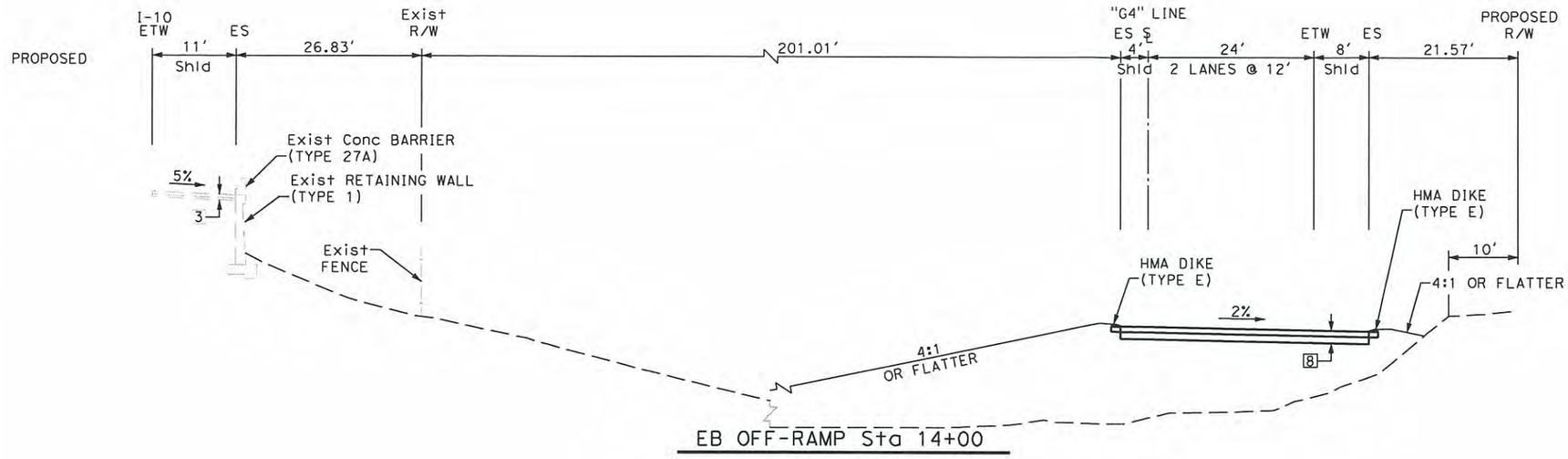
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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

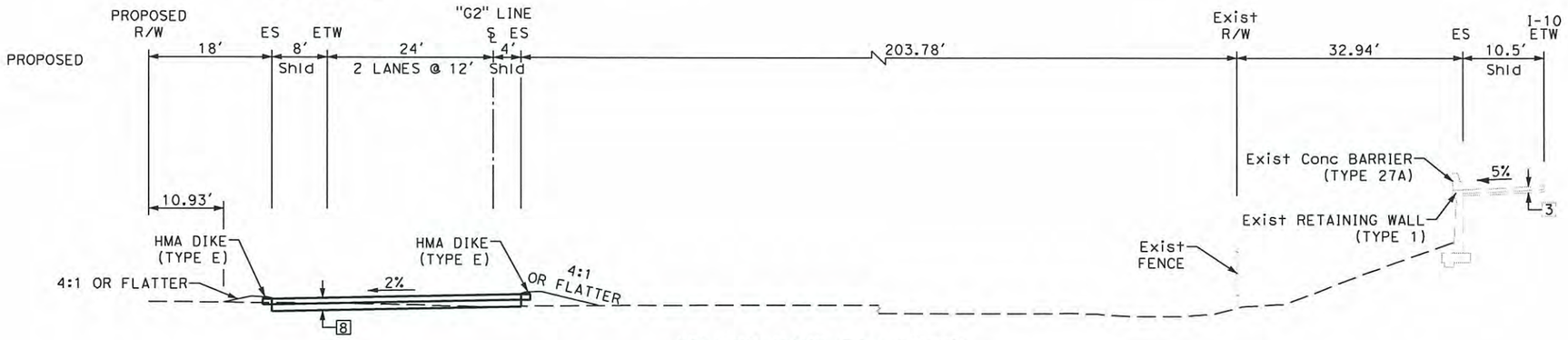
CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



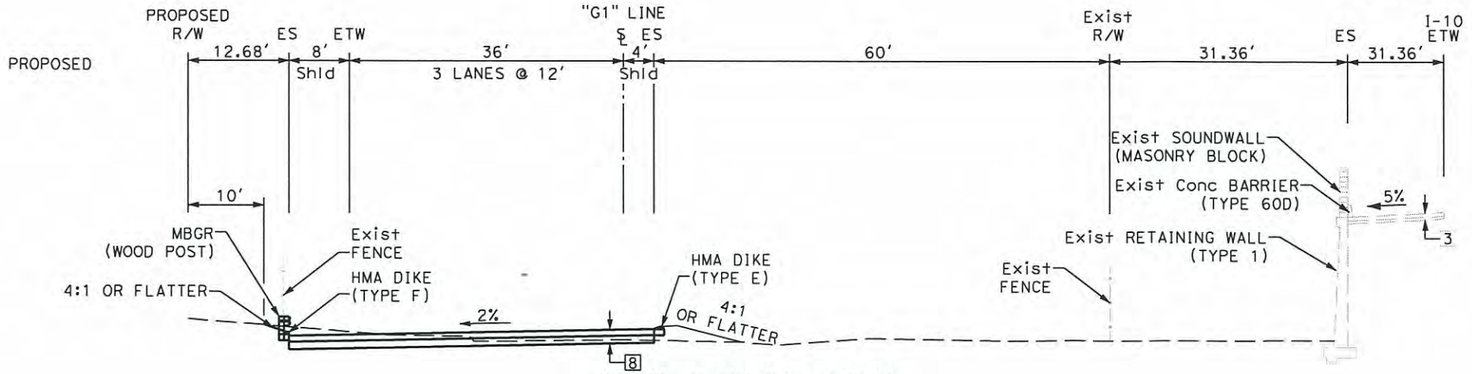
EB OFF-RAMP Sta 14+00

"G4" LINE
SECTION C-C



WB OFF-RAMP Sta 11+60

"G2" LINE
SECTION B-B



WB ON-RAMP Sta 14+00

"G1" LINE
SECTION A-A

ALTERNATIVE 2: DIAMOND

SCALE 1"=10'

X-5

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

DESIGN OVERSIGHT
NASSIM ELIAS

CALCULATED-DESIGNED BY

CHECKED BY

REVISED BY

DATE REVISED

LAST REVISION DATE PLOTTED => 9/15/2010

BORDER LAST REVISED 11/1/2006

RELATIVE BORDER SCALE 0 1 2 3

USERNAME => Alvaradof
DGN FILE => I-10 Alt2 X-05.dgn

CU 00000

EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

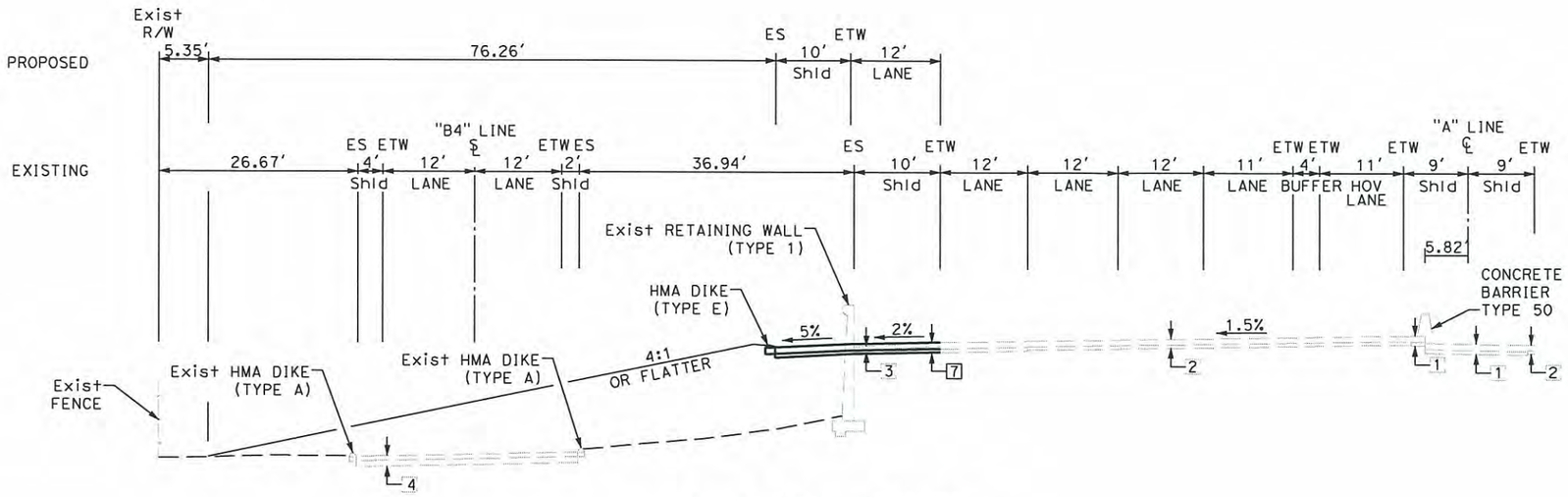
PLANS APPROVAL DATE

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

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

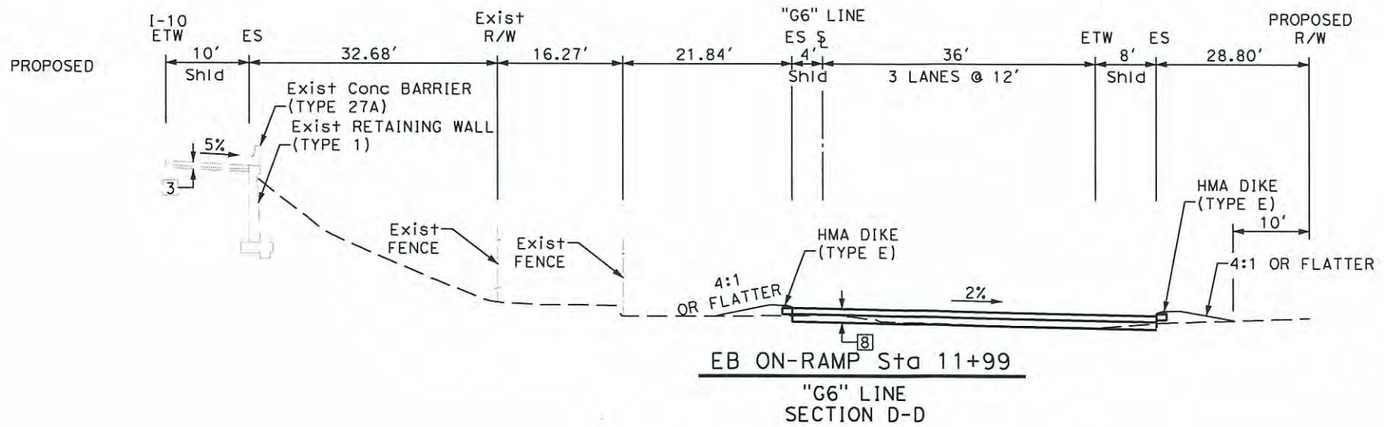
CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



ROUTE 10 Sta 281+00

"A" LINE
SECTION G-G



EB ON-RAMP Sta 11+99

"G6" LINE
SECTION D-D

ALTERNATIVE 2: DIAMOND

SCALE 1"=10'

X-6

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

DESIGN OVERSIGHT: NASSIM ELIAS

CALCULATED-DESIGNED BY

CHECKED BY

REVISED BY

DATE REVISED

LAST REVISION

DATE PLOTTED =>

BORDER LAST REVISED 11/1/2006

RELATIVE BORDER SCALE 0 1 2 3

USERNAME => Alvaradof

CU 00000

EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

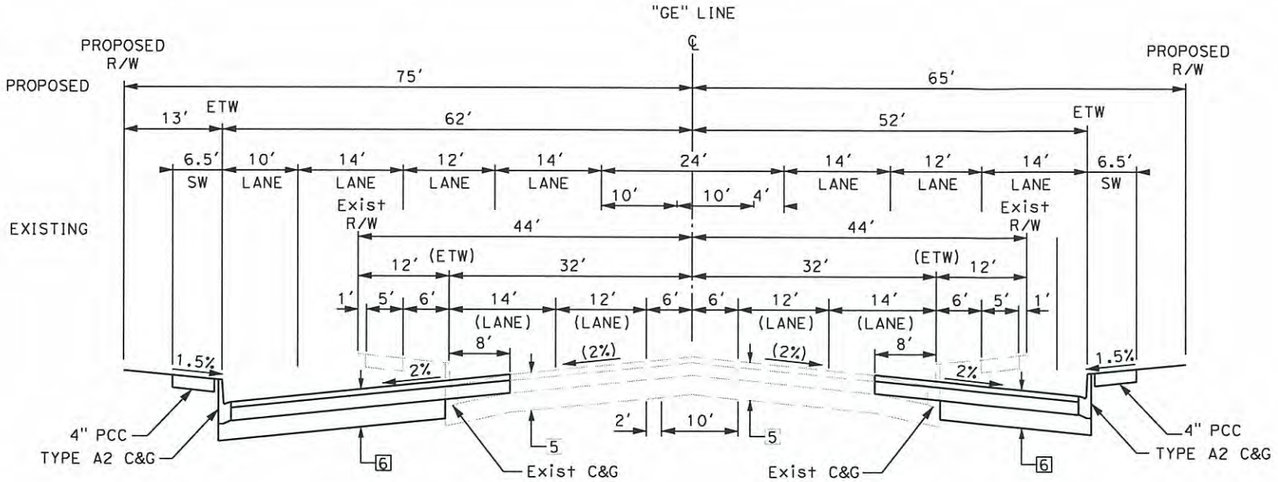
PLANS APPROVAL DATE

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

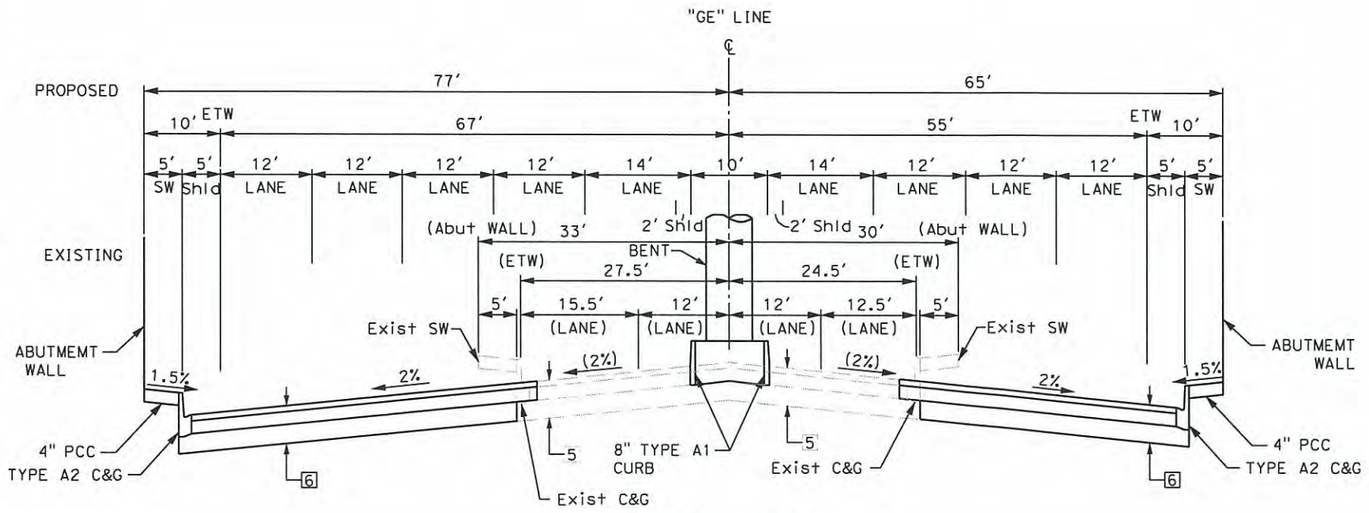
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



GROVE AVENUE
SOUTH OF I-10 TO 4th STREET



GROVE AVENUE
AT I-10 UC

ALTERNATIVE 2: DIAMOND

SCALE 1"=10′

X-7

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

DESIGN OVERSIGHT
NASSIM ELIAS

LAST REVISION | DATE PLOTTED => 9/15/2010

BORDER LAST REVISED 11/1/2006 | RELATIVE BORDER SCALE 0 1 2 3 | USERNAME => Alvaradof | CU 00000 | EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

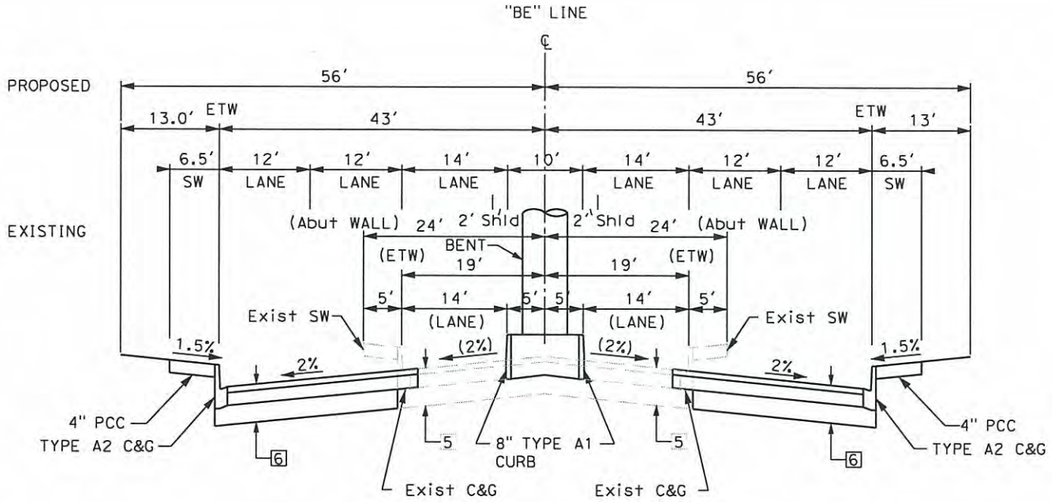
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

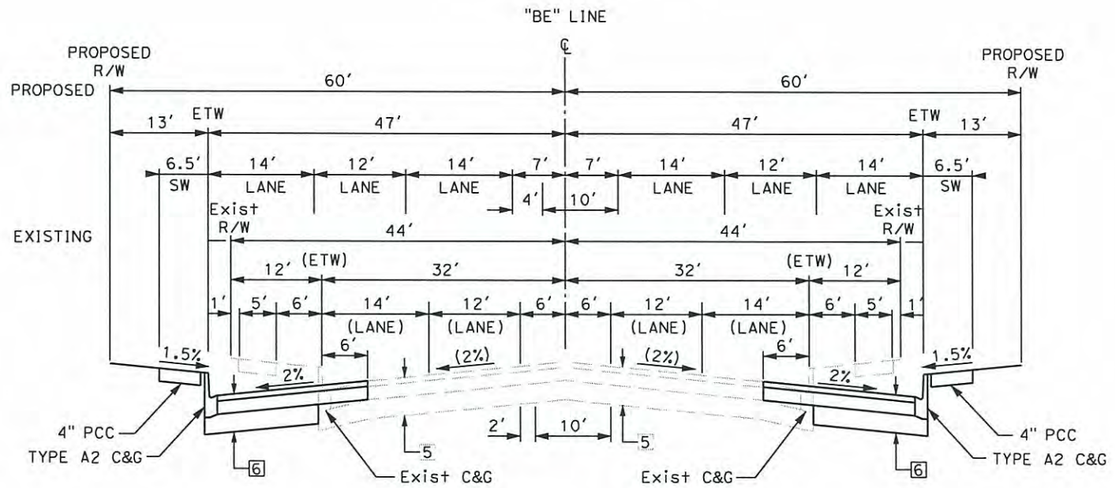
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

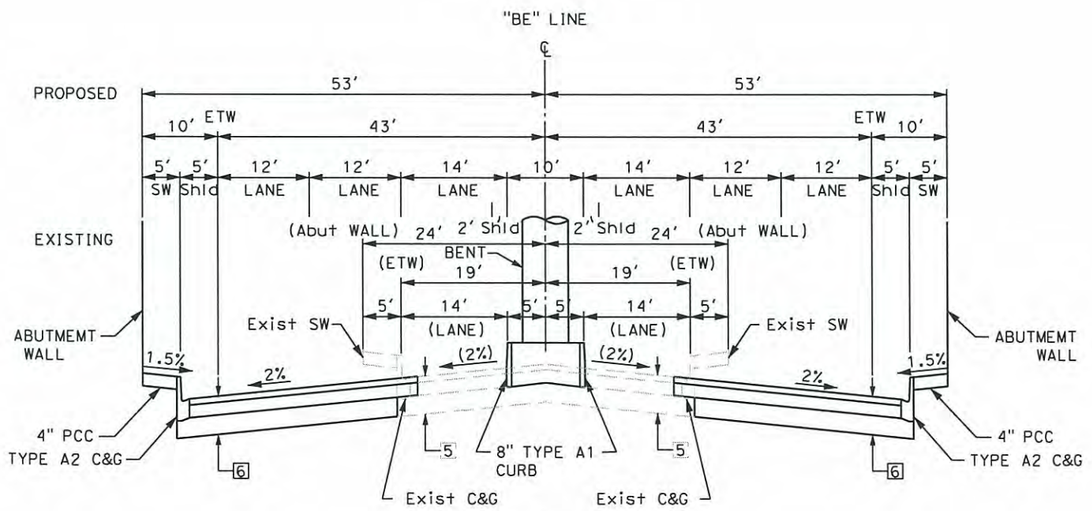
AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



4TH STREET
EAST OF I-10 TO BAKER AVE



4th STREET
WEST OF I-10 TO GROVE AVE



4TH STREET
AT I-10 UC

ALTERNATIVE 2: DIAMOND

SCALE 1"=10'

X-8

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

DESIGN OVERSIGHT
NASSIM ELIAS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

LAST REVISION | DATE PLOTTED => 9/15/2010

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

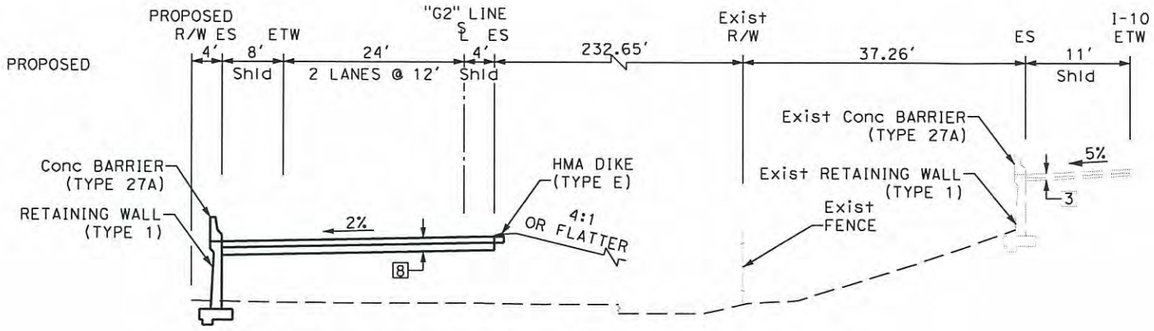
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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

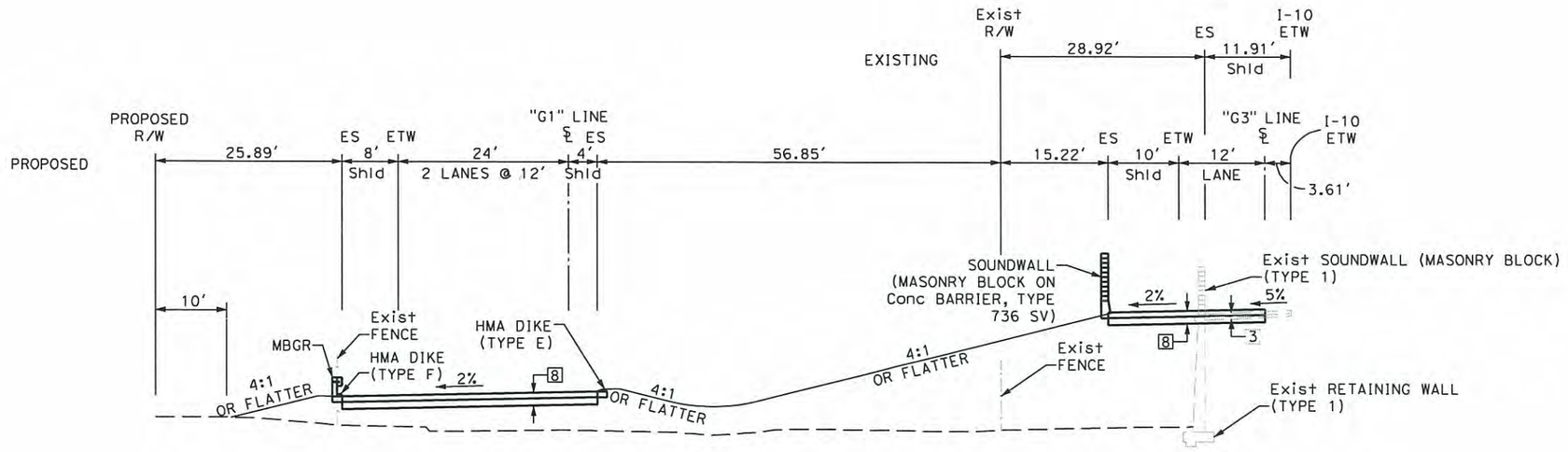
CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



WB OFF-RAMP Sta 12+00

"G2" LINE
SECTION B-B



WB ON-RAMP/WB ON-LOOP Sta 14+00/4+00

"G1" LINE/ "G3" LINE
SECTION A-A

ALTERNATIVE 3: PARCLO(L9)

SCALE 1"=10'

X-9

REVISED BY | DATE REVISED
CALCULATED-DESIGNED BY | CHECKED BY
DESIGN OVERSIGHT: NASSIM ELIAS
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

LAST REVISION | DATE PLOTTED => 9/15/2010

BORDER LAST REVISED 11/1/2006 | RELATIVE BORDER SCALE 0 1 2 3 | USERNAME => Alvaradof | CU 00000 | EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

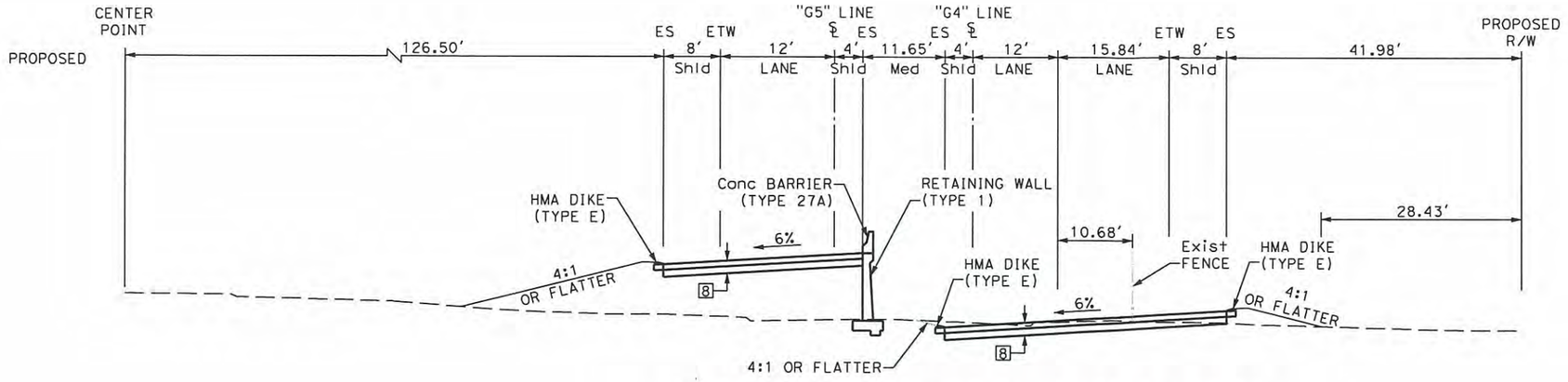
PLANS APPROVAL DATE

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

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

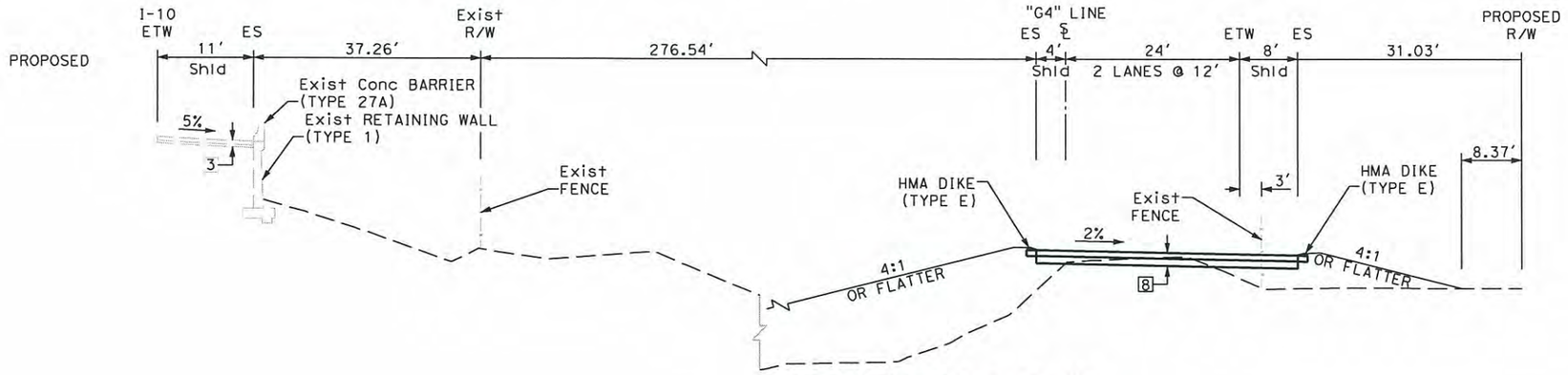
CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



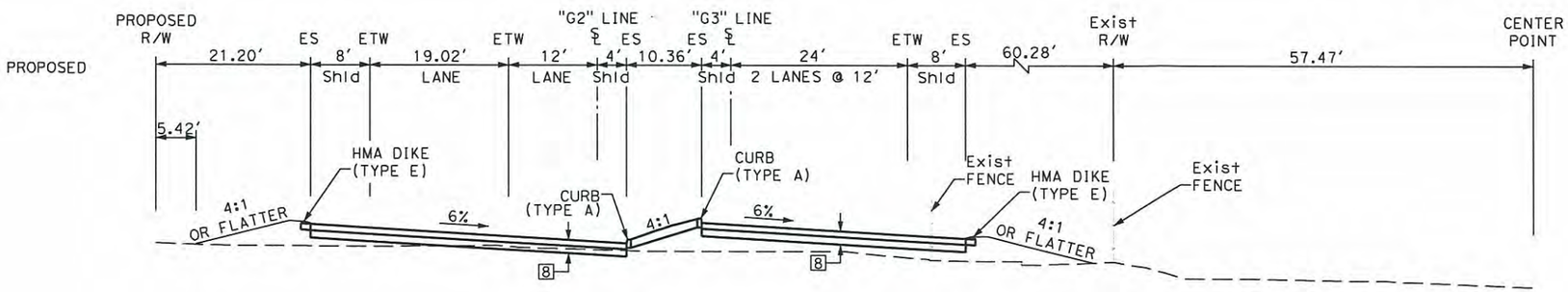
EB ON-LOOP/EB OFF-RAMP Sta 11+39/Sta 18+30

"G5" LINE/ "G4" LINE
SECTION E-E



EB OFF-RAMP Sta 14+00

"G4" LINE
SECTION D-D



WB OFF-RAMP/WB ON-LOOP Sta 7+00/Sta 14+33

"G2" LINE/ "G3" LINE
SECTION C-C

ALTERNATIVE 3: PARCLO(L9)

SCALE 1"=10'

X-10

DESIGN OVERSIGHT: NASSIM ELIAS

CALCULATED-DESIGNED BY

CHECKED BY

REVISED BY

DATE REVISED

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION | DATE PLOTTED => 9/15/2010

BORDER LAST REVISED 11/1/2006 | RELATIVE BORDER SCALE 0 1 2 3 | USERNAME => Alvaradof | CU 00000 | EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

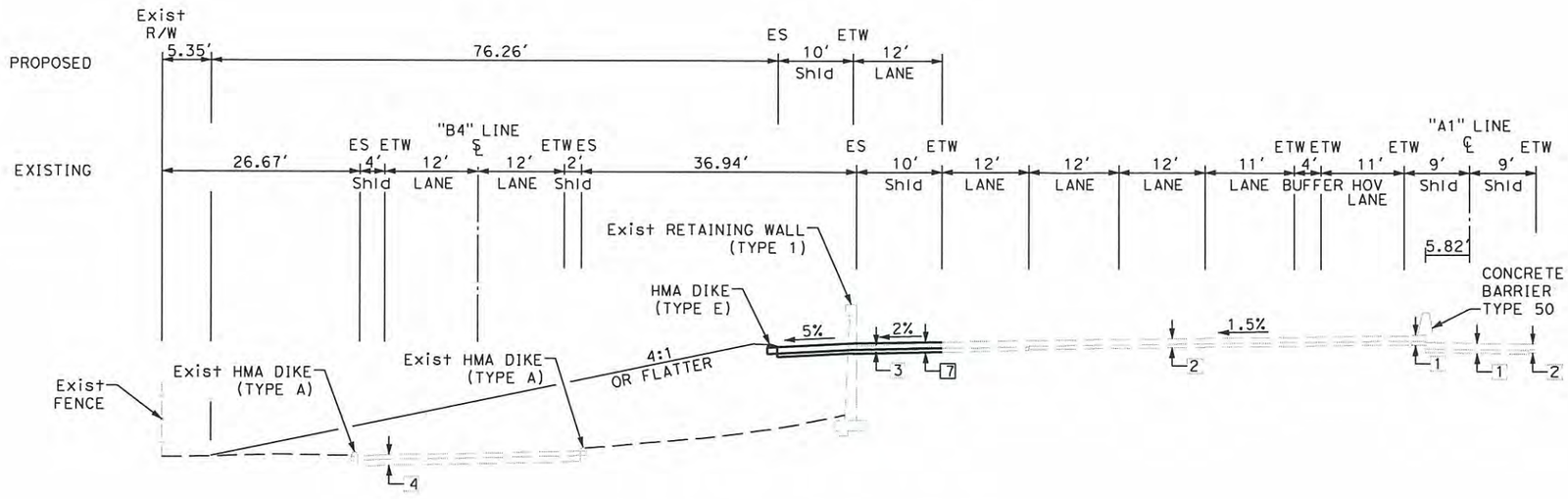
PLANS APPROVAL DATE

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

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

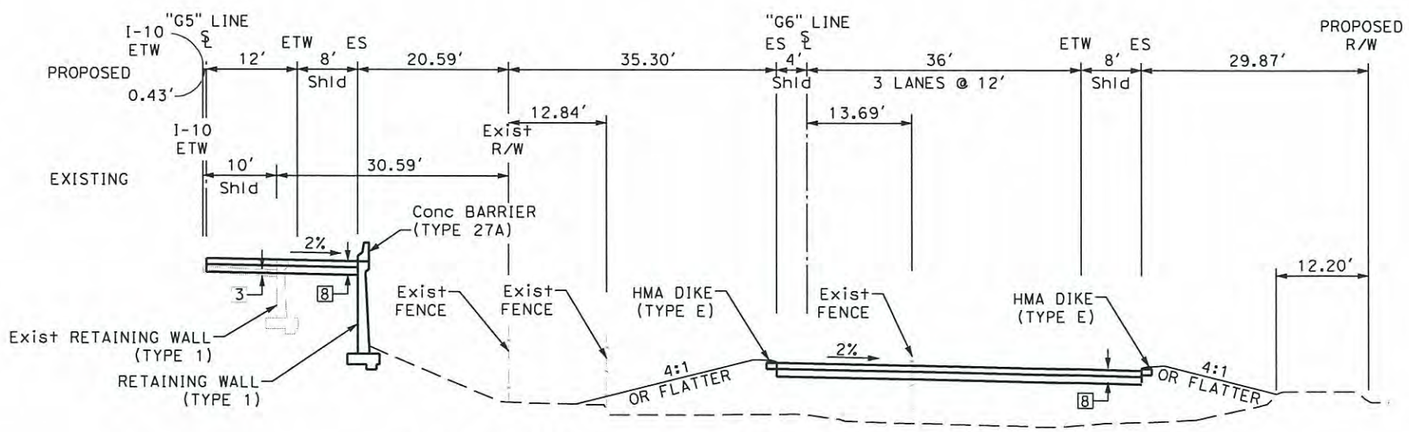
CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



ROUTE 10 Sta 281+00

"A" LINE
SECTION G-G



EB ON-LOOP/EB ON-RAMP Sta 12+00/22+00

"G5" LINE/ "G6" LINE
SECTION F-F

ALTERNATIVE 3: PARCLO(L9)

SCALE 1"=10'

X-11

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans

DESIGN OVERSIGHT: NASSIM ELIAS

CALCULATED-DESIGNED BY | CHECKED BY

REVISED BY | DATE REVISED

LAST REVISION | DATE PLOTTED => 9/15/2010

BORDER LAST REVISED 11/1/2006 | RELATIVE BORDER SCALE 0 1 2 3 | USERNAME => Alvaradof | CU 00000 | EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

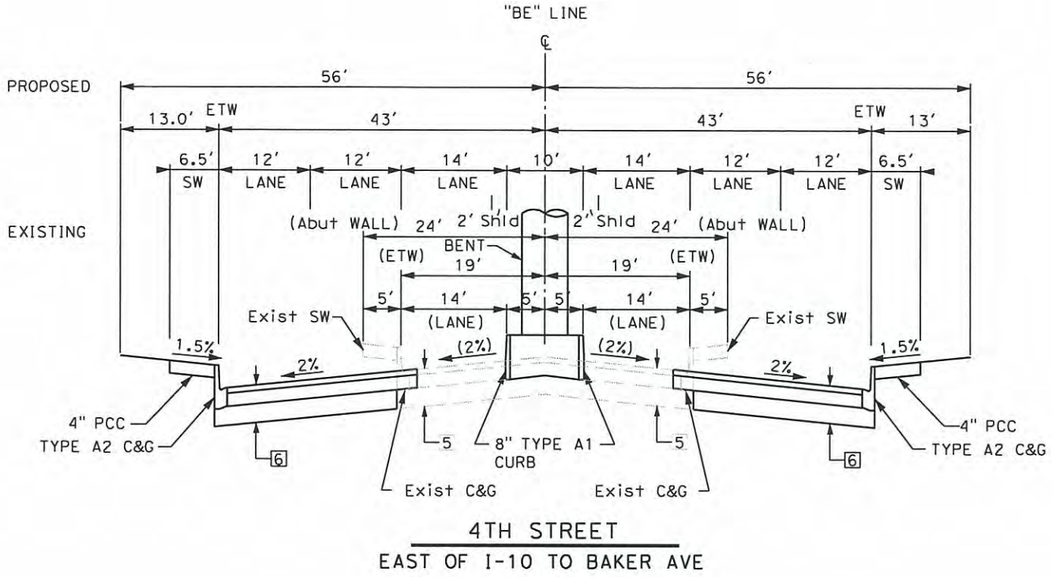
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

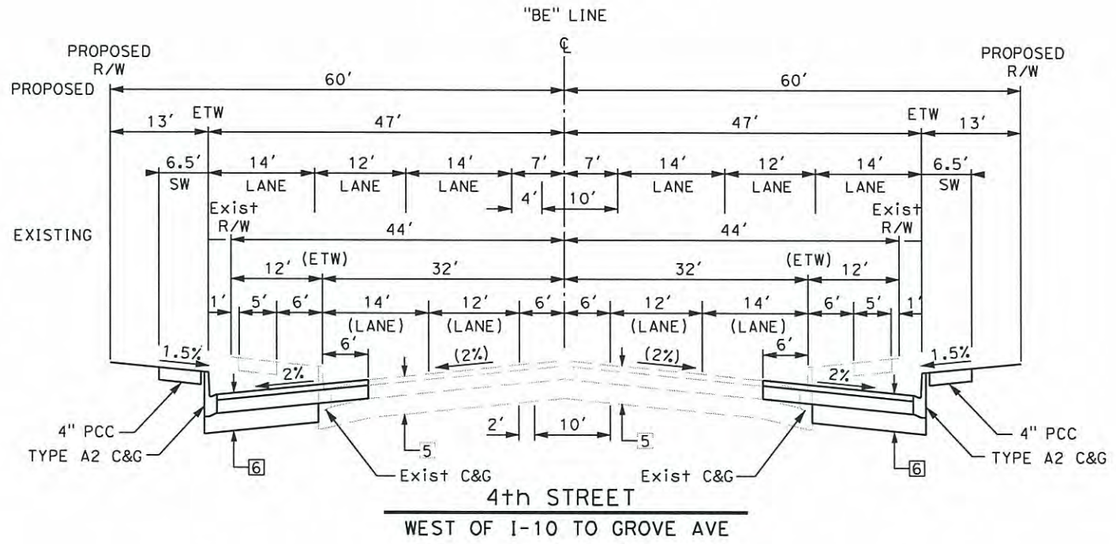
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

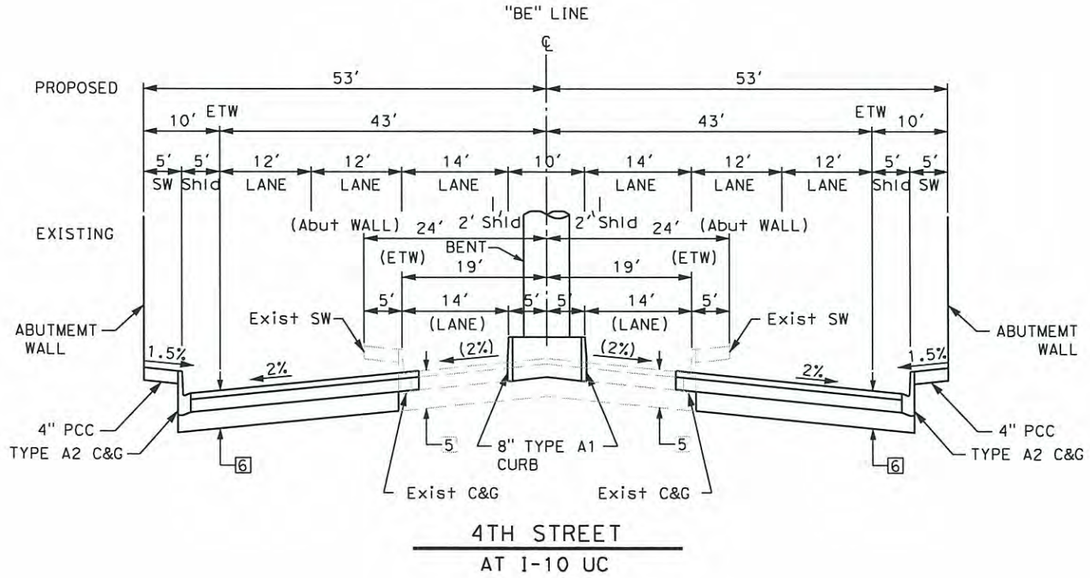
AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



4TH STREET
EAST OF I-10 TO BAKER AVE



4th STREET
WEST OF I-10 TO GROVE AVE



4TH STREET
AT I-10 UC

ALTERNATIVE 3: PARCLO(L9)

SCALE 1"=10'

X-12

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

DESIGN OVERSIGHT: NASSIM ELIAS
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED
LAST REVISION
DATE PLOTTED => 9/15/2010

BORDER LAST REVISED 11/1/2006
RELATIVE BORDER SCALE 0 1 2 3
USERNAME => Alvaradof
CU 00000
EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1	XXX	XXX

REGISTERED CIVIL ENGINEER DATE

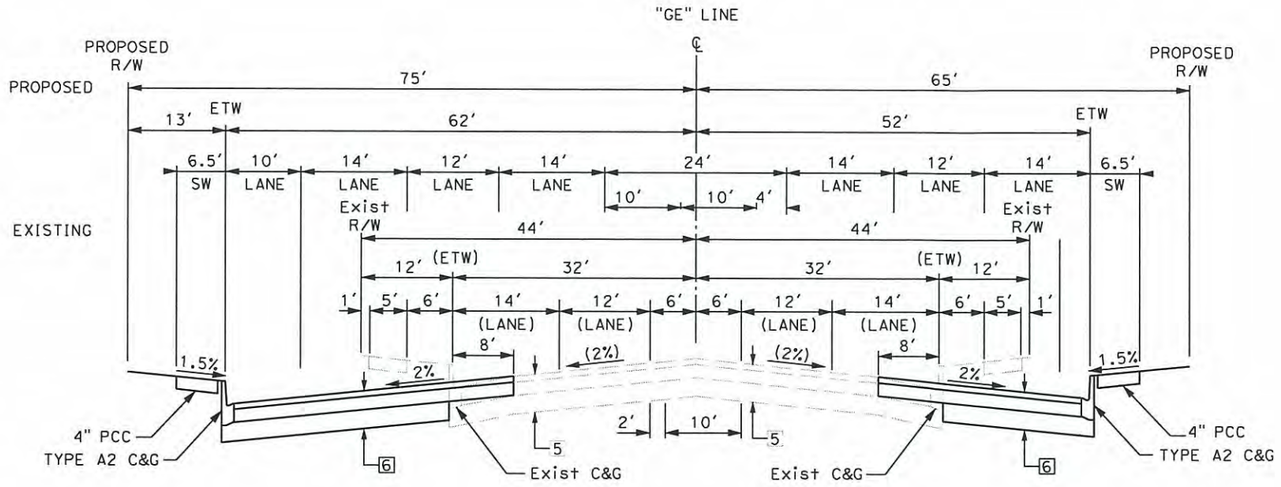
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

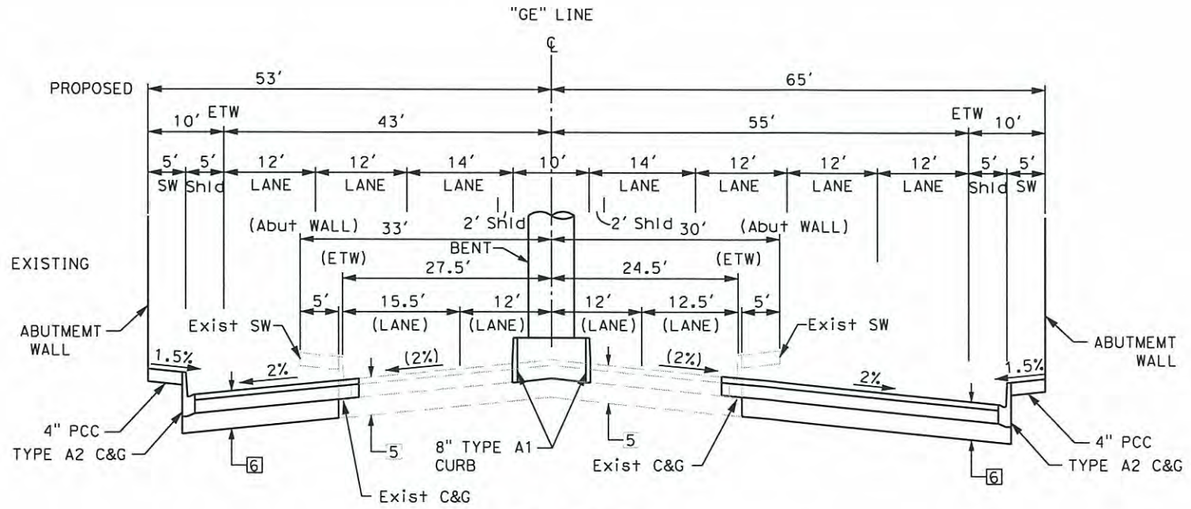
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ELECTRONIC COPIES OF THIS PLAN SHEET.

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762



GROVE AVENUE
SOUTH OF I-10 TO 4th STREET



GROVE AVENUE
AT I-10 UC

ALTERNATIVE 3: PARCLO(L9)

SCALE 1"=10'

X-13

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

DESIGN OVERSIGHT: NASSIM ELIAS

CALCULATED-DESIGNED BY | CHECKED BY

REVISED BY | DATE REVISED

LAST REVISION | DATE PLOTTED => 9/15/2010

BORDER LAST REVISED 11/1/2006

RELATIVE BORDER SCALE 0 1 2 3

USERNAME => Alvaradof
DGN FILE => I-10 Alt3 X-13.dgn

CU 00000

EA 0J400K

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
8	SBd	10	4.1/6.1		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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

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

CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

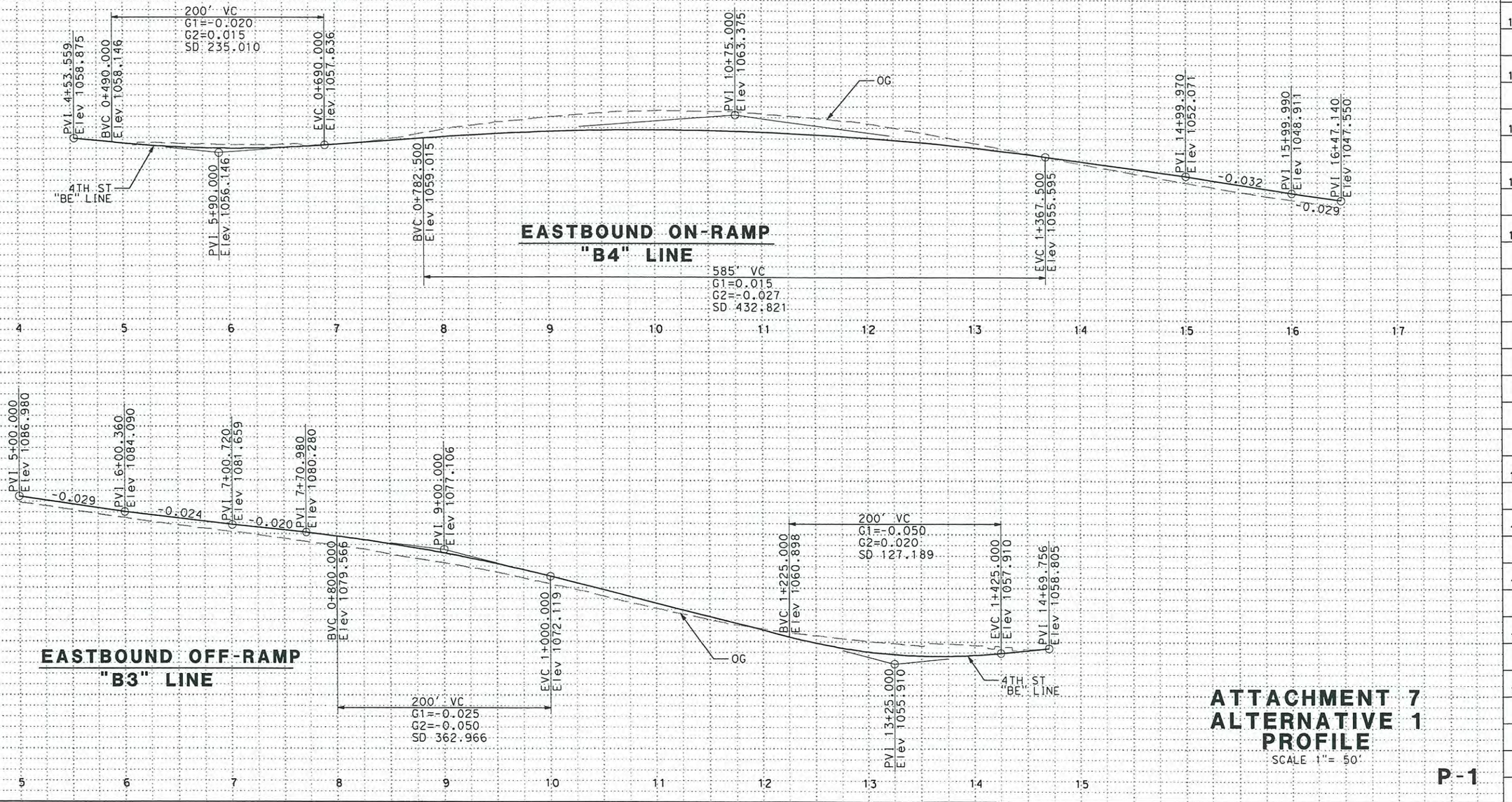
AECOM
1131 WEST SIXTH STREET
ONTARIO, CA 91762

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

DESIGN OVERSIGHT
NASSIM ELIAS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans



ATTACHMENT 7
ALTERNATIVE 1
PROFILE

SCALE 1"= 50'

P-1

STATION			TOTAL
CY	Exc		
	Emb		

LAST REVISION => $DATE
DATE PLOTTED => $DATE
TIME PLOTTED => $TIME

BORDER LAST REVISED 3/1/2007

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => $USER
DGN FILE => $REQUEST

CU 00000

EA 0J400K