Dist-County-Route: 08-SBD-10

Post Mile (Kilometer Post) Limits:
4.61/6.61 (7.42/10.64) 4.1/6.1 (6.60/9.82)

Project Type: Reconstruct Grove Avenue/ Fourth Street Interchange

EA: 0J400K

RU: 08-185

Program Identification: 400.010

Phase: ☒PID ☐PA/ED ☐PS&E

Regional Water Quality Control Board(s): Santa Ana RWQCB (8)

Is the project required to consider incorporating Treatment BMPs? ☒Yes ☐No

- If yes, can Treatment BMPs be incorporated into the project? ☒Yes ☐No

  If No, a Technical Data Report must be submitted to the RWQCB at least 60 days prior to PS&E Submittal. List submittal date: _____

Total Disturbed Soil Area: 1,251,124 sf (28.7 acres)

Estimated Construction Start Date: 12-01-2014 Construction Completion Date: 12-1-2017

Notification of Construction (NOI) Date to be submitted: 11-01-2014

Notification of ADL reuse (if Yes, provide date) ☐Yes Date: _____ ☒No

Separate Dewatering Permit (if Yes, permit number) ☐Yes Permit #: _____ ☒No

This Report has been prepared under the direction of the following Licensed Person. The Licensed Person attests to the technical information contained herein and the data upon which recommendations, conclusions, and decisions are based. Professional Engineer or Landscape Architect stamp required at PS&E.

Brian B. Balderrama, *Registered Project Engineer* — Date 5/19/2010

I have reviewed the storm water quality design issues and find this report to be complete, current, and accurate:

REGISTERED PROFESSIONAL ENGINEER
BRIAN BENJAMIN BALDERRAMA
No. C 72084
Exp. 6/30/12
CIVIL
STATE OF CALIFORNIA

Nassim Elias, *Project Manager* — Date 6/7/2010

Jim Dodd, *Designated Maintenance Representative* — Date 6-9-10

Ray Desselle, *Designated Landscape Architect Representative* — Date 6/22/10

Catherine Jochai, *District/Regional SW Coordinator or Designee* — Date 9/16/10

CK 9-16-10

STORM WATER DATA INFORMATION

1. Project Description

A proposal has been made by the City of Ontario, in cooperation with SANBAG and Caltrans, to initiate a study concerning the improvement of the existing Interstate 10 (I-10) interchange at 4th Street in Ontario, California. This diamond interchange was built in the 1950's when levels of traffic demand were much lower that those of today. In order to alleviate present traffic congestion, remove current operational deficiencies, increase the level of safety, and accommodate future traffic demands, three design alternatives have been put forth. They are the following:

1. Minimum build (see Attachment D): This alternative uses the existing ramp geometrics and layout with modifications done on the existing ramps and Fourth Street lane configurations to meet near and long term traffic demands. This alternative will modify the east-bound on-ramp and widen the existing west and eastbound off-ramps, westbound on-ramp terminus, and bridges at Fourth Street and Grade Avenue.

2. Diamond interchange relocated to Grove Avenue (see Attachment D): This alternative relocates the interchange to Grove Avenue and terminates the existing Fourth Street ramp configurations. This interchange would have two lane on-ramps and off-ramps in each direction along with the widening of the existing bridges at Fourth Street and Grove Avenue.

3. Partial cloverleaf interchange relocated to Grove Avenue (see Attachment D): In addition to two lane on-ramps and off-ramps in each direction there would an additional loop on-ramp in each direction. The existing bridges at Fourth Street and Grove Avenue would widen as well.

Disturbed soil areas (DSAs) for the above 3 alternatives were calculated using closed polyline sets in Microstation:

1. **Minimum Build: 536,002 sf (12.3 acres)**
2. **Diamond: 1,191,205 sf (27.3 acres)**
3. **Partial Cloverleaf: 1,251,124 sf (28.7 acres)**

Existing and post construction impervious area for the 3 alternatives are the following:

1. **Minimum Build:**
   Existing impervious surface area: 265,857 sf (6.1 acres)
   Post construction impervious surface area: 360,723 sf (8.3 acres)
2. **Diamond:**
   Existing impervious surface area: 734,098 sf (16.8 acres)
   Post construction impervious surface area: 362,614 sf (8.3 acres)
3. **Partial Cloverleaf:**
   Existing impervious surface area: 917,692 sf (21.1 acres)
   Post-construction impervious surface area: 426,496 sf (9.8 acres)

Because the partial cloverleaf alternative results in the most disturbed area and the greatest impact to the existing area, all computations for BMP considerations will be based on this data.

The major MS4 facilities within the project that would be impacted by the proposed construction are owned and maintained by San Bernardino County Flood Control. They are the following:

1. **8th Street Detention Basin No. 3 located just south of the I10 and west of Grove Avenue.**
2. **8th Street Detention Basin No. 3 Spreading Grounds just south of the basin and in the northwest corner of Grove Avenue and 4th Street.**
3. **West Cucamonga Channel that runs south from the 8th Street Basin.**

4. Various curb inlets and storm drain lines running south along Grove Avenue and 4th Street.

In particular, Detention Basin No. 3, would be significantly impacted by the construction of the partial cloverleaf. The on-ramp and off-ramp in that area cut across the basin at 2 locations. Redesign of the basin, with additional area required, would be necessary to maintain its function and avoid disruption to the flood control facilities upstream and downstream.

2. Define Site Data and Storm Water Quality Design Issues (refer to Checklists SW-1, SW-2, and SW-3)

The nearest receiving body of water would be Valley Reach of Cucamonga Creek and the Hydrologic sub-area would be 801.21 (see Hydrologic Sub-Area data in Attachment E). This area is approximately 4.6 miles downstream from the site. Given the far distance, greater than one mile, there is no Target Design Constituent (TDC) requirement for this project (see Attachment F).

Since wetlands and navigable waterways are not found within this urban project site, it is assumed the Clean Water Act Section 401 certification is not required. Advanced studies with Caltrans and the environmental consultant in the PA/ED phase will determine whether the project will require a 401 certification.

Basin No. 3 and its adjacent spreading grounds are part of the 8th spreading basin and groundwater recharge facilities and is a component of groundwater management in the Chino Basin. It is located just south of the I-10 and just east of Grove Avenue.

During this phase, it is assumed that no RWQCB requirements or concerns are required. To date, the City of Ontario and SANBAG have not required special considerations nor had special concerns for this project other than traffic relief and minimizing or eliminating encroachment into the Cucamonga Creek right-of-way.

The City of Ontario is located about 35 miles east of Los Angeles at a latitude of 34° 03' N and longitude of 117° 37' W and at an elevation of approximately 925 feet above sea level. It has an average high temperature of 80° (F) and an average low temperature of 50° (F). The rainy season begins October 1 and lasts until May 1 with an average rainfall of 16-18 inches per year with February being the wettest month. The groundwater table varies depending on the season and demand but it is generally at 200 to 300 feet below the ground surface. The current population is 170,000 with a projected increase of 120,000 by the year 2020. Various factors account for this including its proximity to Los Angeles and nearby ports, its ideal location for distribution centers from those ports, and the increase of airport facilities and traffic from Ontario International Airport.

Soils are generally silty sands (SM) and gravelly sands (SP) indicating moderate to good infiltration rates. Per San Bernardino soils maps and isoheytal maps the soil group is "A" and the 100 year-1 hour storm intensity is 1.4 inches per hour respectively. Drainage from the project area is in a southerly, southwesterly direction with the Cucamonga Creek being the main drainage and flood control facility.

Reuse of soil containing Aerially Deposited Lead (ADL) is unknown at this time. Sampling will be performed using a California Waste Extraction Test (Ca WET) during the environmental or design phase.

The extent of required right-of-way acquisition for BMPs is unknown at this time.

Regardless of reconstruction at Fourth Street or Grove Avenue Interchange activity, this project will provide storm water BMPs to the fullest extent possible to prevent or contain polluted runoff.

There are no existing treatment BMPs within the project limits or associated with this project.

3. Regional Water Quality Control Board Agreements

Currently there is no negotiated understanding or agreement with the Santa Ana RWQCB pertaining to this project.

It is anticipated that the project would require a Section 401 Water Quality Certification, Section 404 Permit, and Section 1602 Streambed Alteration Agreement.

4. Describe Proposed Design Pollution Prevention BMPs to be used on the Project.

Downstream Effects Related to Potentially Increased Flow, Checklist DPP-1, Parts 1 and 2

Identify velocity or volume of downstream flow

Alternative 1:

This alternative should increase volume and velocity of flow due to an increase in impervious area within the project limits. The project proposes to implement an on-site drainage system and permanent BMPs for surface runoff generated within the project limits.

Channeling of runoff will be handled with the use of bioswales in ditch areas where possible. These will be constructed adjacent to the new pavement and designed to capture flows that ultimately will be conveyed to the West Cucamonga Channel. Proposed ramp infield areas provide areas where extended detention and infiltration facilities can be located. These facilities provide water quality treatment and mitigated peak flows before entering the existing storm drain system. For the eastbound off-ramp, where the infield area is slightly minimized, additional right of way will provide needed space for the construction of additional infiltration basins to increase water quality.

Alternatives 2 and 3:

These alternatives should decrease volume and velocity of flow due to a decrease in impervious area within the project limits. The project proposes to implement an on-site drainage system and permanent BMPs for surface runoff generated within the project limits.

Channeling of runoff will be handled with the use of bioswales in ditch areas where possible. These will be constructed adjacent to the new pavement and designed to capture flows that ultimately will be conveyed to the West Cucamonga Channel. Proposed ramp infield areas provide areas where extended detention and infiltration facilities can be located. These facilities provide water quality treatment and mitigated peak flows before entering the existing storm drain system.

As stated before, the project site is highly urbanized with significant areas full developed with impervious surfaces. As previous impervious surfaces such as parking lots, surface streets, and buildings are transformed into landscaped slopes and infiltration basins, runoff will be reduced along with an increase in water quality.

Project will discharge to lined and hardened rectangular concrete flood control channels under the jurisdiction San Bernardino Flood Control District.

All alternatives:

Increased sediment loading should be negligible due to an increase in maintained impervious road surface area and landscaped slopes, and the use of bioswales and detention/infiltration facilities.

There is potentially increased flow to the downstream drainage systems under all alternatives. Hydrologic/Hydraulic mitigation, such as hydromodification, will be implemented in order to avoid downstream impacts. Detail studies/design will be performed as the project progresses.

Slope/Surface Protection Systems, Checklist DPP-1, Parts 1 and 3

Because the project proposes an interchange reconstruction, alternative 1 has or maintains all disturbed soil areas with a 4:1 grade or flatter; whereas, for alternatives 2 and 3 no slopes exist. Due to the design of the new earth filled ramps at Grove Avenue several new slopes are created. The project creates all slopes with a 4:1 grade or flatter and proposes to cover them with permanent vegetation. Additionally, hardscape is not required or proposed to protect any new slopes from erosion.

Concentrated Flow Conveyance Systems, Checklist DPP-1, Parts 1 and 4

As previously discussed, the proposed interchange project will alter the existing drainage system. There is potentially increased flow to the downstream drainage systems under all alternatives. The new drainage system will ultimately connect to the existing San Bernardino County Flood Control storm drain system (Cucamonga Creek).

Preservation of Existing Vegetation, Checklist DPP-1, Parts 1 and 5

The project site is located in a highly urbanized area surrounded by highly traveled roadways and a fully developed city environment. With the exception of the detention basin located south of I-10 and east of Grove Avenue, most of the areas that will be cleared and redeveloped are existing buildings and road surfaces with little vegetation to protect. In addition, these essentially impervious areas will be converted to landscaped slopes and infield infiltration basins with a net increase in vegetation. However, the project design proposes to keep as much of the existing vegetation in places as possible. All existing landscape that is disturbed or removed due to construction will be replaced following Caltrans replacement planting policy and procedures.

No environmentally sensitive areas (ESAs) have been identified.

5. Describe Proposed Permanent Treatment BMPs to be used on the Project

Treatment BMP Strategy, Checklist T-1

There is no TDC requirement with this project. All nine permanent BMPs outlined below have been considered for their feasibility.

The proposed permanent treatment BMP strategy treats the collected storm water at the source by directing if first through a biofiltration swales to collect sediment and debris and then into infiltration basins to remove nutrients and pathogens. Both treatment BMPs are proposed to be located in the infield areas between ramps.

With the relatively large areas available for infiltration basins, it is anticipated the 100% of the WQV and WQF will be treated.

Biofiltration Swales/Strips, Checklist T-1, Parts 1 and 2

Biofiltration swales and strips were considered as potential treatment BMPs because they are effective at treating some of the TDCs and have a flexibility for location in almost any design. They should be considered as part of a treatment train by filtering pollutants prior to infiltration. Thus, biofiltration swales and strips are recommended at this time to be incorporated into the project.

Dry Weather Diversion, Checklist T-1, Parts 1 and 3

Dry weather diversions are not applicable because dry weather flows are not anticipated to be persistent. Therefore, these devices are not proposed to be incorporated into the project.

Infiltration Devices – Checklist T-1, Parts 1 and 4

Preliminary investigations indicate the soil within the project area has a hydrologic soil group (HSG) classification of "A". This soil has lower runoff potential along with good to moderate infiltration rates. With a water table that is 200 to 300 feet below the ground surface, infiltration basins are appropriate for removing nutrients and pathogens without the danger of groundwater pollution. Therefore, infiltration basins are recommended as the primary pollutant removal BMP for this project.

Detention Devices, Checklist T-1, Parts 1 and 5

Detention Devices are effective at treating some of the TDCs, however, Caltrans Project Planning and Design Guide (PPDG) treatment (T) checklists identified infiltration devices to be a more effective BMP for the target TDCs. Until a detailed site investigation is performed as the project progresses to verify the effectiveness of a detention device, detention devices are recommended at this time to be incorporated into the project.

Gross Solids Removal Devices (GSRDs), Checklist T-1, Parts 1 and 6

Since receiving bodies of water are not impaired by trash and debris, GSRDs are not recommended to be incorporated into this project.

Traction Sand Traps, Checklist T-1, Parts 1 and 7

Traction sand traps are not applicable because sand or other abrasives are not applied to local roads. Therefore, these devices are not feasible and are not proposed to be incorporated into the project.

Media Filters, Checklist T-1, Parts 1 and 8

Media filters are effective at treating some of the TDCs, however, Caltrans Project Planning and Design Guide (PPDG) treatment (T) checklists identified infiltration devices to be a more effective BMP for the target TDCs. Until a detailed site investigation is performed as the project progresses to verify the effectiveness of a media filter, media filters are recommended at this time to be incorporated into the project.

Multi-Chambered Treatment Trains (MCTTs), Checklist T-1, Parts 1 and 9

Placement of a MCTT will not service a critical source area as required by Caltrans. Thus, MCTTs are not feasible and have not been incorporated into the project.

Wet Basins, Checklist T-1, Parts 1 and 10

Since wet basins are effective at treating some of the identified TDCs and TMDLs, this treatment BMP was considered. However, Caltrans Project Planning and Design Guide (PPDG) treatment (T) checklists identified infiltration devices to be a more effective treatment BMP. Thus, wet basins are not feasible and have not been incorporated into the project.

6. Describe Proposed Temporary Construction Site BMPs to be used on Project

During construction the contractor will be required to implement several temporary site BMPs to limit soil erosion, implement water conservation practices, and maintain the highest water quality. The construction site BMP strategy for this project shall consist of soil stabilization and sediment control devices. At all construction site entrances, the contractor will provide construction stabilized entrances/exits. Dust suppression with regular watering of the non-paved construction site along with street sweeping and vacuuming will be required on paved surfaces. Perimeter controls shall consist of silt fences at the toe of all excavation and embankment slopes and gravel bag berms shall be along the top of slopes. Slope protection shall consist of geotextiles, plastic covers, mulch, and erosion control blankets/mats. Slope interruption devices shall consist of fiber rolls to be implemented on applicable slopes during the construction period. Wherever possible, early implementation of permanent erosion

control seeding or landscape planting shall be installed. All existing and proposed storm drain inlets that receive runoff from the tributary areas will be protected with inserts or check dams such as gravel bags berms. As per the 2007 SWPPP and WPCP Preparation Manual, desilting basins will also be required as temporary BMPs.

The contractor will be required to manage all stock piles against wind and water erosion. The contractor will also be required to manage non-storm water, waste management, and materials pollution control by overseeing vehicle and equipment cleaning, vehicle and equipment fueling, vehicle and equipment maintenance, and prevention of spills. In addition, the contractor will be required to manage solid waste, hazardous waste, contaminated soil, concrete waste, sanitary/septic waste, and all other liquids.

Since the water table varies from 200 to 300 below the surface and no drilling is proposed, dewatering is not planned for this project. Thus, a separate dewatering permit will not be required from the Regional Water Quality Control Board.

Exact details, locations, and the temporary construction site BMP schedule for this project will be required with the final contract specifications. The contractor will be required to submit a Storm Water Pollution Prevention Plan (SWPPP) for approval before construction begins.

Costs of individual BMPs were estimated based on a percentage of the total cost for construction site BMPs as observed from the cost estimates of similar construction projects as detailed in the storm water BMP cost summary (Attachment L).

7. Maintenance BMPs (Drain Inlet Stenciling)

Drain inlet stenciling will be required within the City of Ontario's right of way along Grove Avenue and 4th Street, but not required for the proposed inlets located within the Caltrans right of way.

REQUIRED ATTACHMENTS

- ⇒ **ATTACHMENT A - Vicinity Map**
- ⇒ **ATTACHMENT B - Evaluation Documentation Form (EDF)**
- ⇒ **ATTACHMENT C - Treatment BMP Summary Spreadsheets (required, if Treatment BMPs are incorporated into project)**

SUPPLEMENTAL ATTACHMENTS

Note: Supplement Attachments are to be supplied during the SWDR approval process; where noted, some of these items may only be required on a project-specific basis.

- ⇒ **ATTACHMENT D – Proposed Project Interchange Design Alternatives**
- ⇒ **ATTACHMENT E – Hydrologic Sub-Area Data**
- ⇒ **ATTACHMENT F – Flowpath from Project Site to Outfall Area**
- ⇒ **ATTACHMENY G – Checklist SW-1: Site Data Sources**
  Checklist SW-2: Storm Water Quality Issues Summary
  Checklist SW-3: Measures for Avoiding or Reducing Storm Water Impacts
- ⇒ **ATTACHMENT H - Checklists DPP-1, Parts 1–5 (Design Pollution Prevention BMPs)**
- ⇒ **ATTACHMENT I - Checklists T-1, Parts 1-10**
- ⇒ **ATTACHMENT J - Checklists CS-1, Parts 1–6 (Construction Site BMPs)**

⇒ **ATTACHMENT K – Flow and Volume Based BMP Design Calculations**

⇒ **ATTACHMENT L – Storm Water BMP Cost Summary**
Table F-3, Appendix F, PPDG
Preliminary Project Total Cost Estimate

Attachment A
Vicinity Map

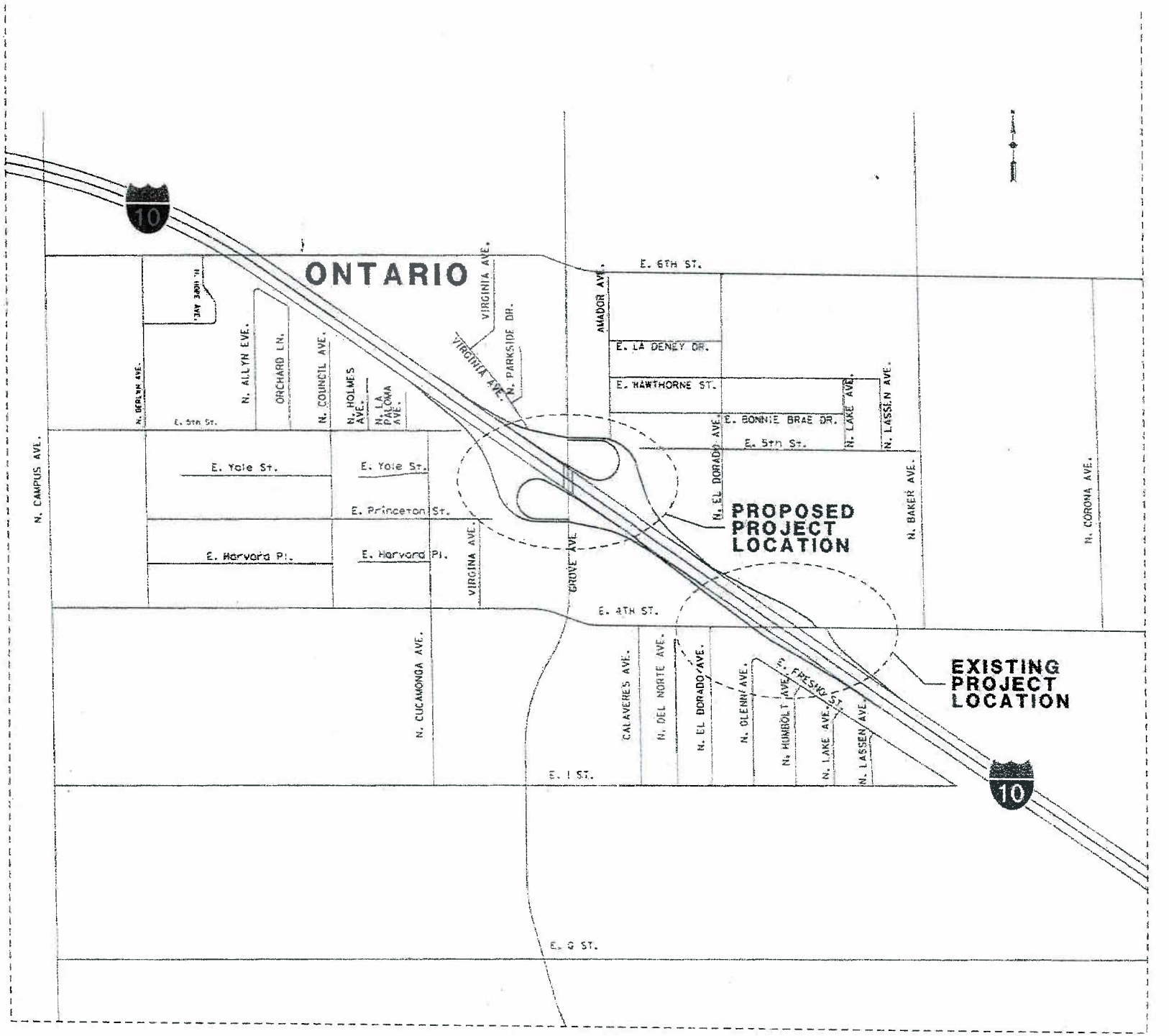

ONTARIO
10
N. BERLYN AVE.
N. ALLYN EVE.
ORCHARD LN.
N. COUNCIL AVE.
N. HOLMES AVE.
N. LA PALOMA AVE.
E. 5th St.
VIRGINIA AVE.
N. PARKSIDE DR.
AMADOR AVE.
E. 6TH ST.
E. LA DENEY DR.
E. HAWTHORNE ST.
E. BONNIE BRAE DR.
N. EL DORADO AVE.
N. LAKE AVE.
N. LASSEN AVE.
E. 5th St.
N. CAMPUS AVE.
E. Yale St.
E. Princeton St.
E. Harvard Pl.
VIRGINA AVE.
GROVE AVE.
PROPOSED PROJECT LOCATION
N. BAKER AVE.
N. CORONA AVE.
E. 4TH ST.
N. CUCAMONGA AVE.
CALAVERES AVE.
N. DEL NORTE AVE.
N. EL DORADO AVE.
N. GLENN AVE.
N. HUMBOLT AVE.
N. LAKE AVE.
N. LASSEN AVE.
E. FRESNO ST.
EXISTING PROJECT LOCATION
E. I ST.
10
E. Q ST.

FIGURE 1

Project Study Report

Existing Conditions at I-10 & Grove Ave. Interchange

BOYLE | AECOM

BOYLE ENGINEERING
1131 W. 6th Street, Suite 250
Ontario, CA 91762
T (909) 933-5225 F (909) 933-5228

www.boyle.aecom.com

Attachment B
Evaluation Documentation Form

Evaluation Documentation Form

DATE: 7-7-10

Project ID (or EA): 0J400K

NO.	CRITERIA	YES ✓	NO ✓	SUPPLEMENTAL INFORMATION FOR EVALUATION
1.	Begin Project Evaluation regarding requirement for consideration of Treatment BMPs	✓		See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs. Go to 2
2.	Is this an emergency project?		✓	If **Yes**, go to 10. If **No**, continue to 3.
3.	Have TMDLs or other Pollution Control Requirements been established for surface waters within the project limits? Information provided in the water quality assessment or equivalent document.		✓	If **Yes**, contact the District/Regional NPDES Coordinator to discuss the Department's obligations under the TMDL (if Applicable) or Pollution Control Requirements, go to 9 or 4. _____ *(Dist./Reg. SW Coordinator initials)* If **No**, continue to 4.
4.	Is the project located within an area of a local MS4 Permittee?	✓		If **Yes**. *(Ontario, CA)*, go to 5. If **No**, document in SWDR go to 5.
5.	Is the project directly or indirectly discharging to surface waters?	✓		If **Yes**, continue to 6. If **No**, go to 10.
6.	Is it a new facility or major reconstruction?	✓		If **Yes**, continue to 8. If **No**, go to 7.
7.	Will there be a change in line/grade or hydraulic capacity?			If **Yes**, continue to 8. If **No**, go to 10.
8.	Does the project result in a net increase of one acre or more of new impervious surface?	✓		If **Yes**, continue to 9. If **No**, go to 10. *(28.7 acres (Total DSA quantity)*
9.	Project is required to consider approved Treatment BMPs.	✓		See Sections 2.4 and either Section 5.5or 6.5 for BMP Evaluation and Selection Process. Complete Checklist T-1 in this Appendix E.
10.	Project is not required to consider Treatment BMPs. _____*(Dist./Reg. Design SW Coord. Initials)* _____*(Project Engineer Initials)* _____ *(Date)*			Document for Project Files by completing this form, and attaching it to the SWDR.

See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs

Attachment C

Treatment BMP Summary Spreadsheets

Treatment BMP
Summary Spreadsheet

Dist-County-Route:	**08-SBd-10**
Post Mile (Kilometer Post) Limits:	**4.1/6.1 (6.60/9.82)**
Project Type:	**Freeway Interchange**
EA:	**0J400K**
RU:	
Program Identification:	**HE 11**
Phase:	**PID**
Date:	**05/19/10**

Infiltration Basins

District-County-Route: **08-SBd-10**

EA: **0J400K**

County	Route	Location Post Mile (PM)	Location KiloPost (KP)	Water Quality Volume (Cubic Feet)
LA	10	4.1	6.6	45,810

As discussed in the report, infiltration basins are recommended.

08-SBD-10

4.1/6.1 (6.60/9.81)

Freeway Interchange

0J400K

5/19/2010

Biofiltration Strips

District-County-Route: **08-SBd-10**

EA: **0J400K**

County	Route	Location Post Mile (PM)	Location KiloPost (KP)	Design Flow (CFS)
LA	10	4.1	6.6	2.42

As discussed in the report, Bio filtratioin strips and swales are recommended.

08-SBD-10

4.1/6.1 (6.60/9.81)

Freeway Interchange

0J400K

5/19/2010

Detention Basins

District-County-Route: 08-SBd-10

EA: 0J400K

County	Route	Location Post Mile (PM)	Location KiloPost (KP)	Water Quality Volume (Cubic Feet)
LA	10	4.1	6.6	45,810

As mentioned in the report, detention basins are recommended.

08-SBD-10

4.1/6.1 (6.60/9.81)

Freeway Interchange

0J400K

5/19/2010

Traction Sand Trap Devices

District-County-Route: **08-SBd-10**

EA: **0J400K**

County	Route	Location Post Mile (PM)	Location KiloPost (KP)	Design Volume (Cubic Feet)
LA	10	4.1	6.6	-

Traction Sand Trap Devices are not recommended

08-SBD-10

4.1/6.1 (6.60/9.81)

Freeway Interchange

0J400K

5/19/2010

Dry Weather Flow Diversions

District-County-Route: **08-SBd-10**

EA: **0J400K**

County	Route	Location Post Mile (PM)	Location KiloPost (KP)	Design Volume (Cubic Feet)
LA	10	4.1	6.6	-

Dry Weather Flow Diversions are not recommended

08-SBD-10

4.1/6.1 (6.60/9.81)

Freeway Interchange

0J400K

5/19/2010

MEDIA FILTERS

District-County-Route: **08-SBd-10**

EA: **0J400K**

County	Route	Location Post Mile (PM)	Location KiloPost (KP)	Water Quality Volume (Cubic Feet)
LA	10	4.1	6.6	45,810

As discussed in the report, media filters are recommended.

08-SBD-10

4.1/6.1 (6.60/9.81)

Freeway Interchange

0J400K

5/19/2010

MULTI-CHAMBER TREATMENT TRAINS

District-County-Route: **08-SBd-10**

EA: **0J400K**

County	Route	Location Post Mile (PM)	Location KiloPost (KP)	Water Quality Volume (Cubic Feet)
LA	10	4.1	6.6	-

As discussed in the report, MCTTs are not recommended.

08-SBD-10

4.1/6.1 (6.60/9.81)

Freeway Interchange

0J400K

5/19/2010

WET BASINS

District-County-Route: **08-SBd-10**

EA: **0J400K**

County	Route	Location Post Mile (PM)	Location KiloPost (KP)	Water Quality Volume (Cubic Feet)
LA	10	4.1	6.6	-

As discussed in the report, Wet Basins are not recommended.

08-SBD-10

4.1/6.1 (6.60/9.81)

Freeway Interchange

0J400K

5/19/2010

Gross Solids Removal Devices (GSRDs)

District-County-Route: 08-SBd-10

EA: 0J400K

County	Route	Location Post Mile (PM)	Location KiloPost (KP)	WQV (Cubic Feet)
LA	10	4.1	6.6	8,250

As discussed in the report, a linear radial GSRD is not recommended.

08-SBD-10

4.1/6.1 (6.60/9.81)

Freeway Interchange

0J400K

5/19/2010

Attachment D

Proposed Project Interchange Design Alternatives

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

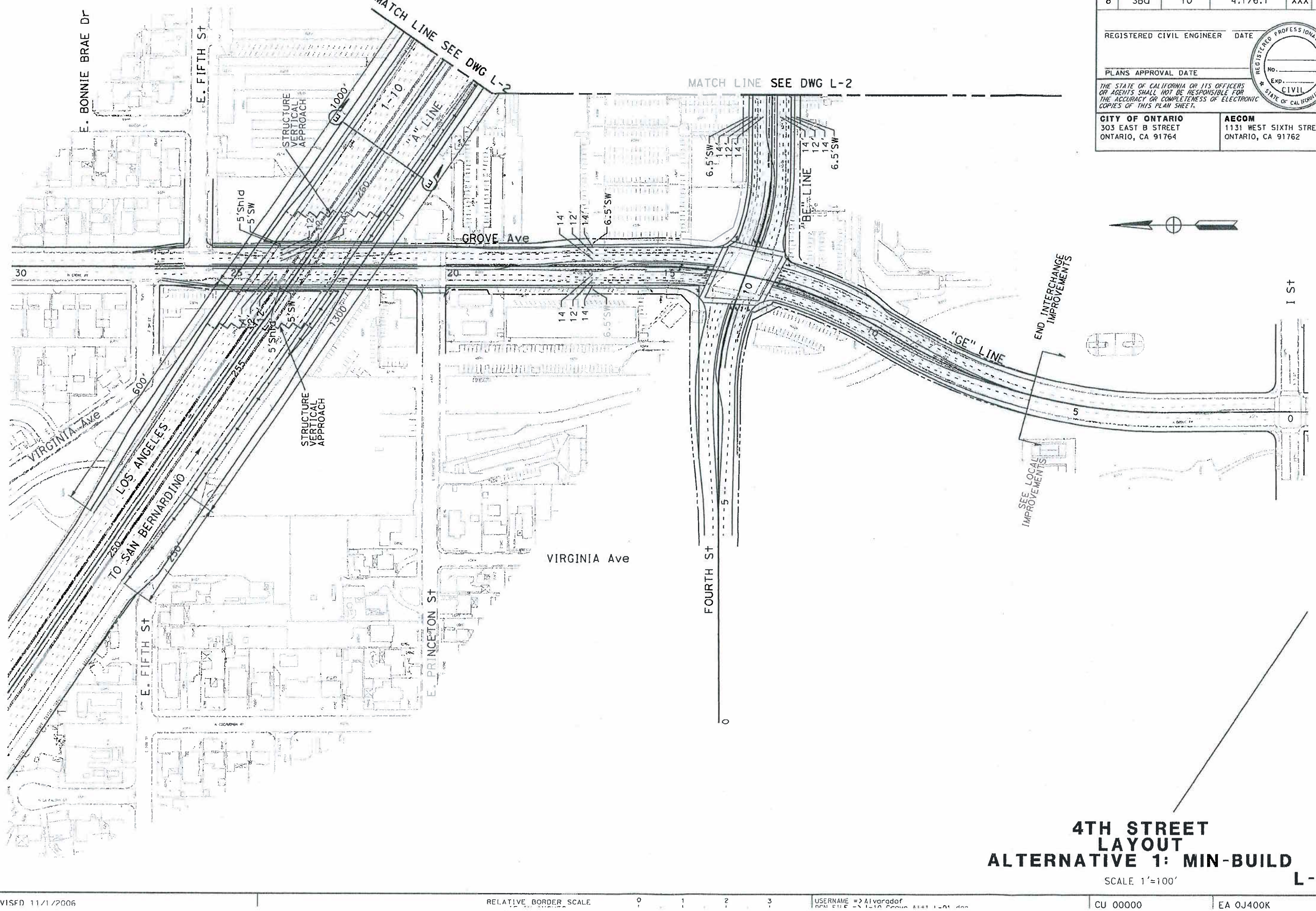
REGISTERED CIVIL ENGINEER DATE

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	AECOM
303 EAST B STREET	1131 WEST SIXTH STREET
ONTARIO, CA 91764	ONTARIO, CA 91762



4TH STREET LAYOUT ALTERNATIVE 1: MIN-BUILD

SCALE 1"=100'

L-1

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

BORDER LAST REVISED 11/1/2006 | RELATIVE BORDER SCALE 0 1 2 3 | USERNAME => Alvaradof | CU 00000 | EA 0J400K | LAST REVISION | DATE PLOTTED => 9/16/2010

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

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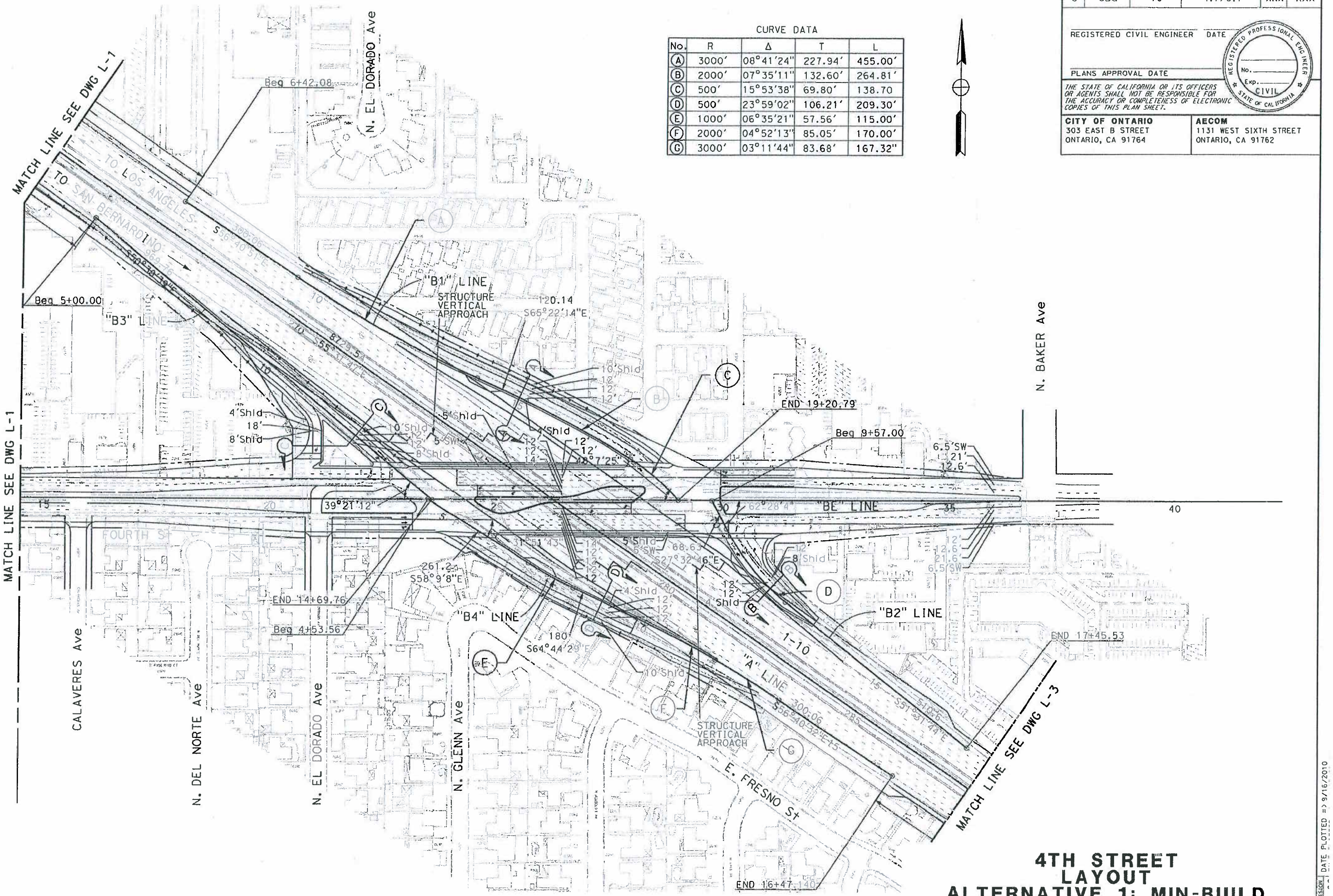
CITY OF ONTARIO
303 EAST B STREET
ONTARIO, CA 91764

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

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

LAST REVISION DATE PLOTTED => 9/16/2010

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

REGISTERED CIVIL ENGINEER DATE

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ONTARIO, CA 91762

MATCH LINE SEE DWG L-3

N. BAKER Ave

I-10

E. FRESNO St

1000'

"A" LINE

12'
10' Shld

N. LAKE Ave

N. LASSEN Ave

E. I St

300

600'

TO SAN BERNARDINO

TO LOS ANGELES

305

4TH STREET LAYOUT ALTERNATIVE 1: MIN-BUILD

SCALE 1"=100'

L-3

REVISED BY	DATE REVISED

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RELATIVE BORDER SCALE 0 1 2 3

USERNAME => Alvaradof

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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

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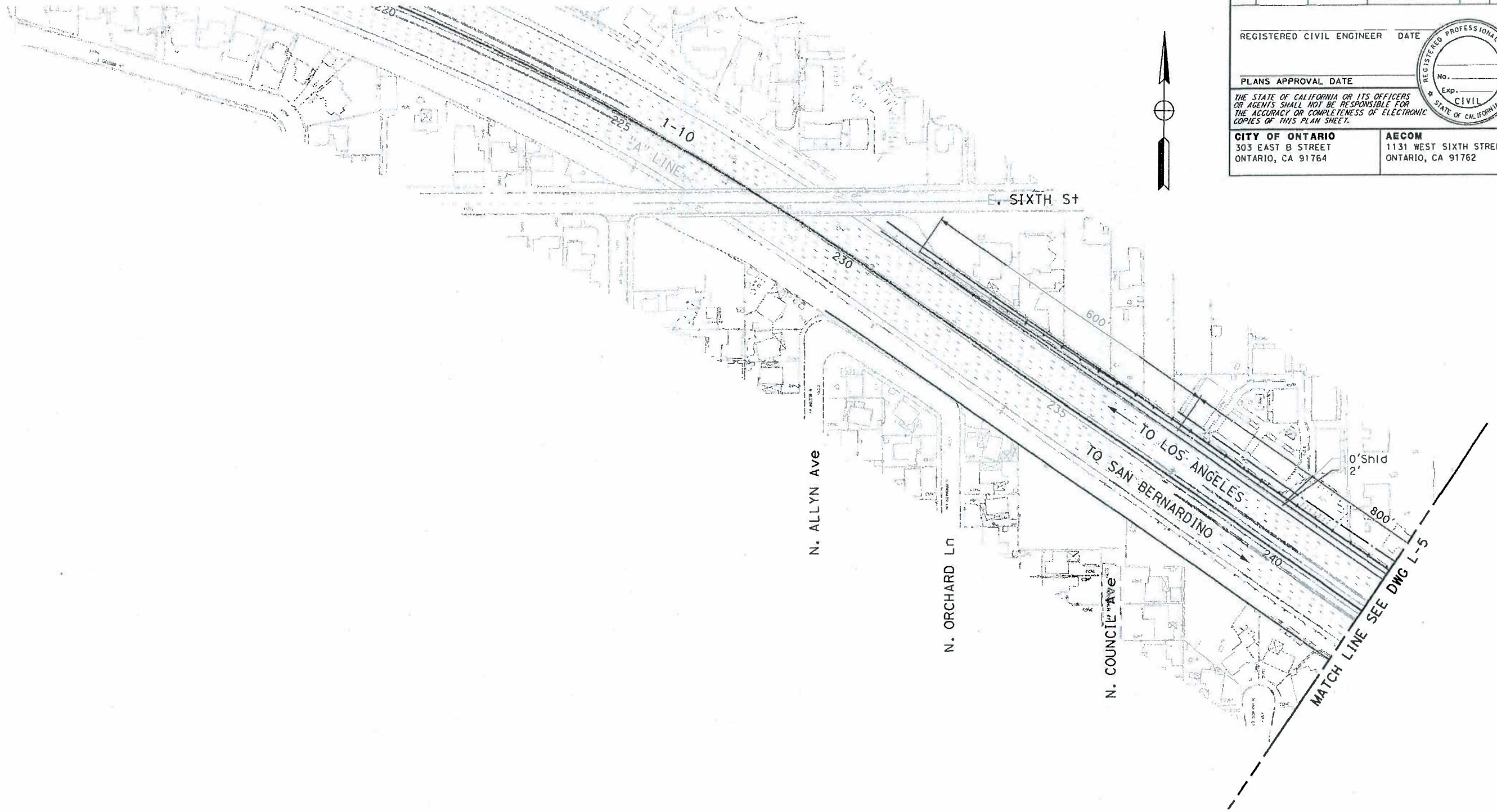

GROVE Ave
LAYOUT
ALTERNATIVE 2: DIAMOND

SCALE 1"=100'

L-4

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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

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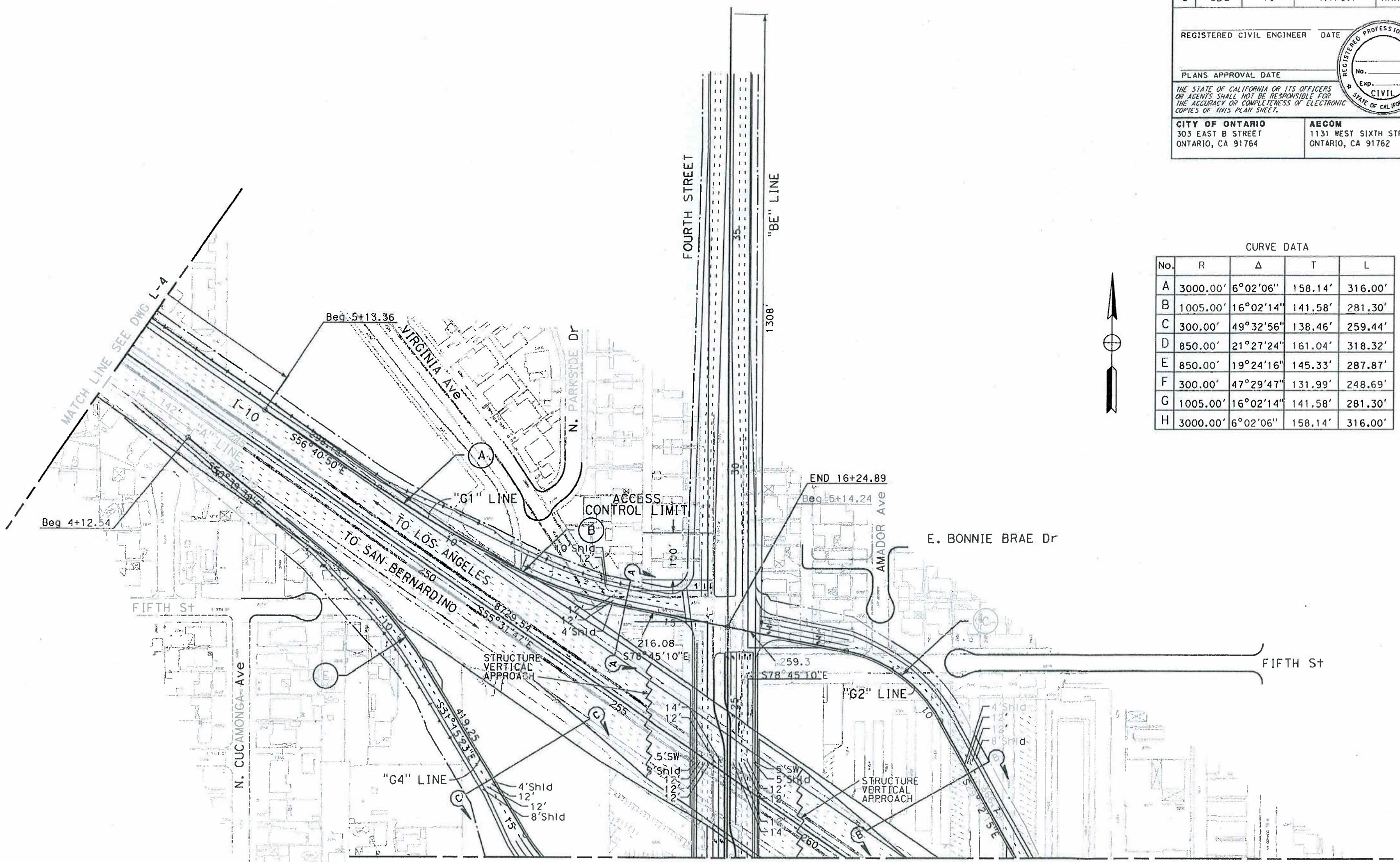
ONTARIO, CA 91764

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

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RELATIVE BORDER SCALE 0 1 2 3

USERNAME => Alvaradof

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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

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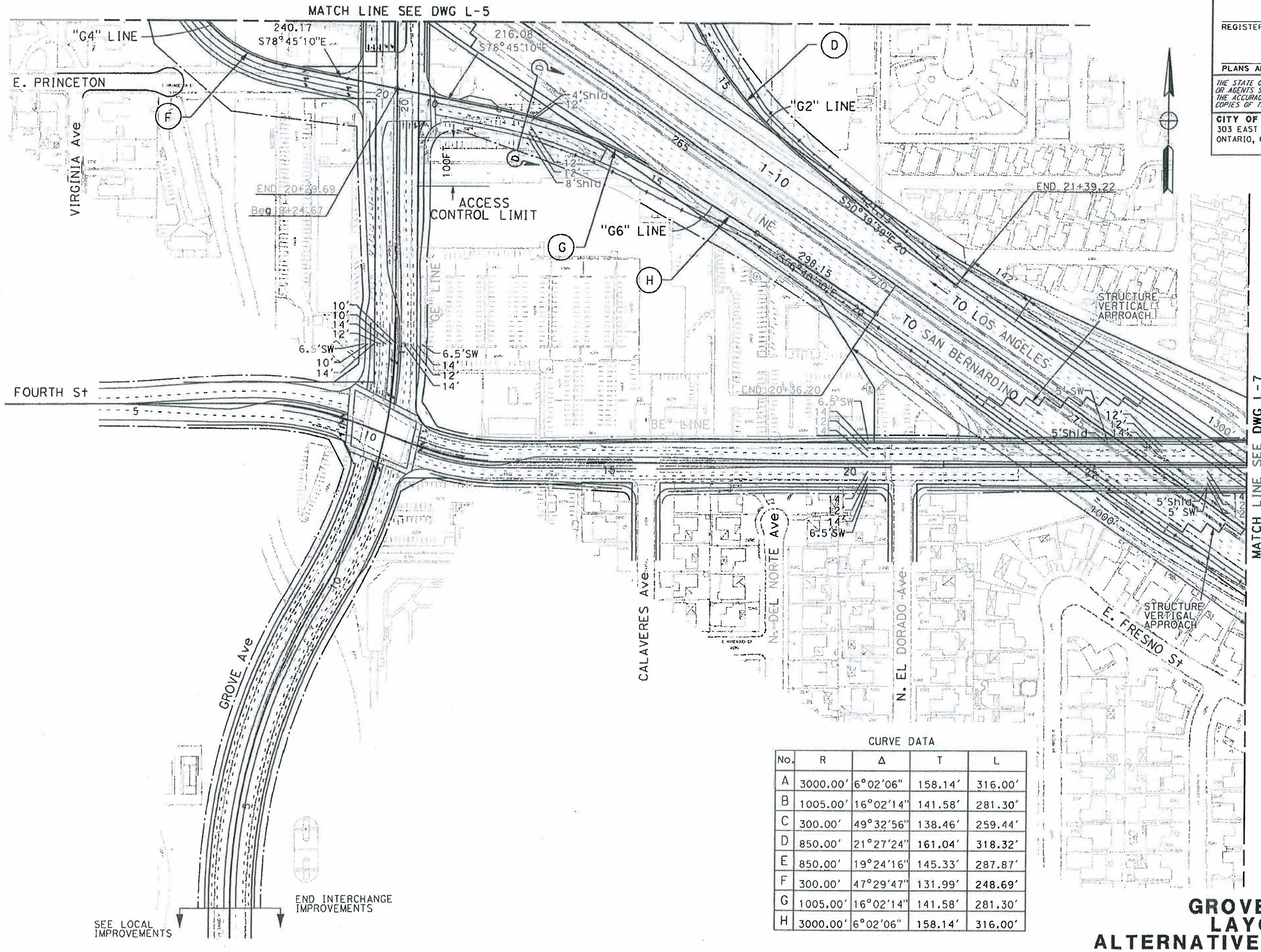

CURVE DATA

No.	R	Δ	T	L
A	3000.00'	6°02'06"	158.14'	316.00'
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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

LAST REVISION DATE PLOTTED => 9/16/2010
TIME PLOTTED => 11:08:57 AM

BORDER LAST REVISED 11/1/2006

RELATIVE BORDER SCALE 0 1 2 3

USERNAME => Alvaradof
DGN FILE => I-10 Grove Alt2 L-06.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

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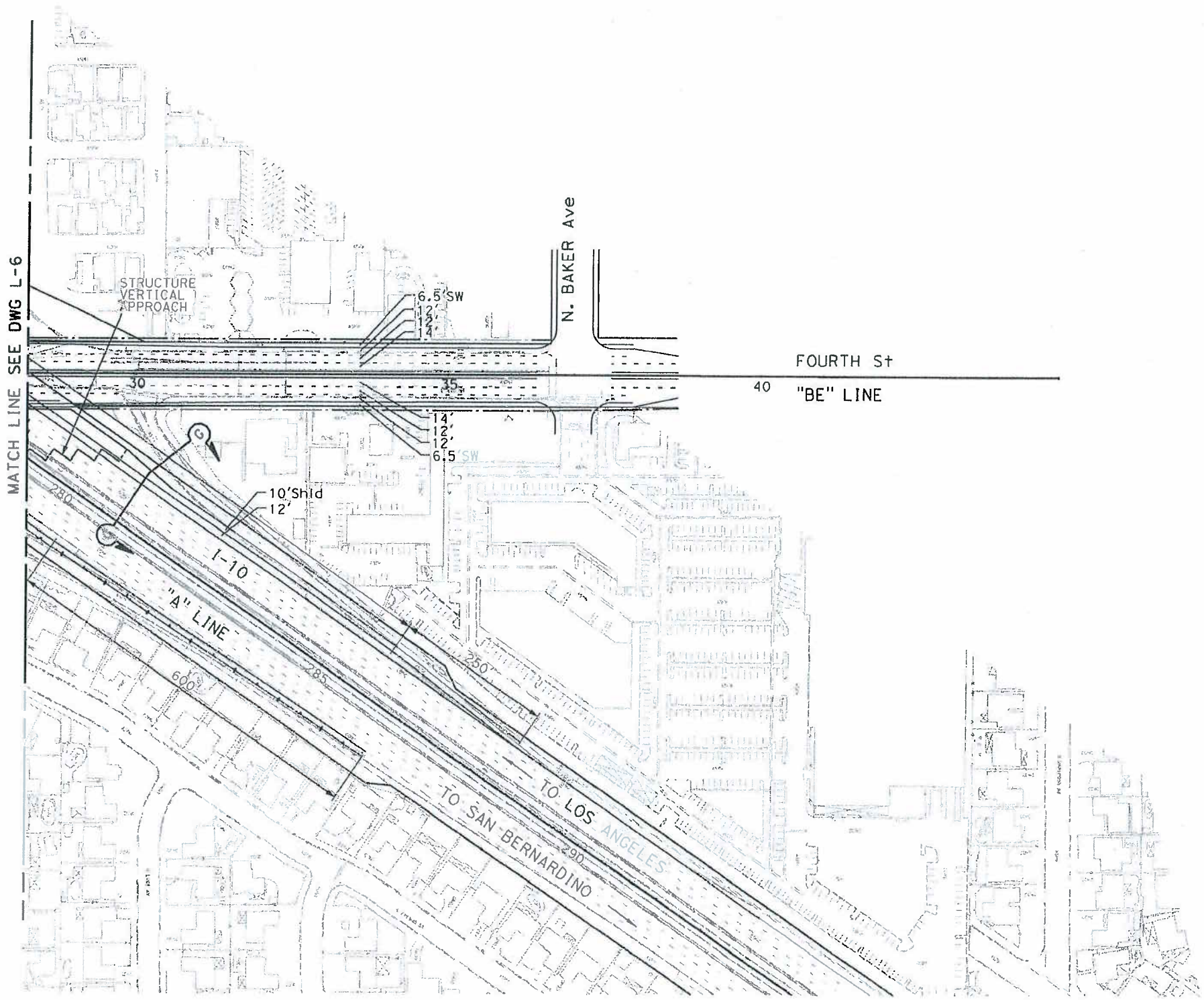

GROVE Ave
LAYOUT
ALTERNATIVE 2: DIAMOND

SCALE 1'=100'

L-7

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CALCULATED-DESIGNED BY

CHECKED BY

DESIGN OVERSIGHT
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00-00-00 TIME PLOTTED => 11:28:50 AM

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RELATIVE BORDER SCALE 0 1 2 3

USERNAME => Alvaradof
DGN FILE => I-10 Grove Alt2 L-07.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

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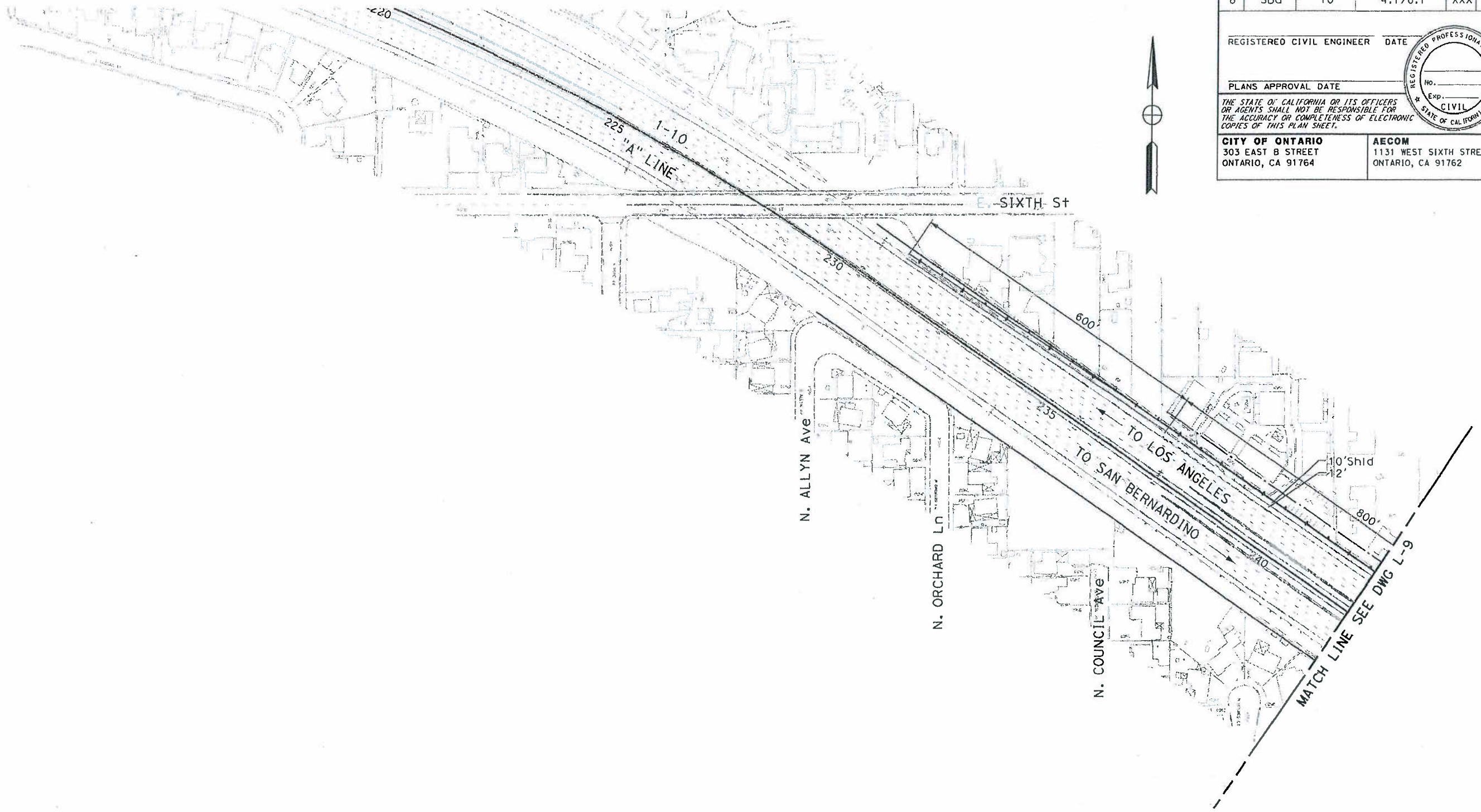

GROVE Ave
LAYOUT
ALTERNATIVE 3: PARCLO (L-9)

SCALE 1'=100'

L-8

REVISED BY | DATE REVISED

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

REGISTERED CIVIL ENGINEER DATE

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ONTARIO, CA 91764

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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′

MATCH LINE SEE DWG L-8

Beg 5+13.36

I-10

S56°40'50"E 298.33

"A" LINE

421.13

S56°40'50"E

"G1" LINE

TO LOS ANGELES

TO SAN BERNARDINO

250

END 2+55.93

Beg 4+12.54

FIFTH St

E. YALE St

N. CUCAMONGA Ave

"G4" LINE

170.71

S18°55'56"E

VIRGINIA Ave

N. PARKSIDE Dr

END 16+25.16

ACCESS CONTROL LIMIT

FOURTH STREET

35

1308′ "BE" LINE

AMADOR Ave

30

Beg 4+54.51

E. BONNIE BRAE Dr

232.11

N89°45'E

237.58

S78°45'10"E

300.08

S56°40'31"E

231.33

S89°45'53"W

FIFTH St

"G2" LINE

"G3" LINE

STRUCTURE VERTICAL APPROACH

"G5" LINE

N. EL DORADO Ave

MATCH LINE SEE DWG L-10

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 ...

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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

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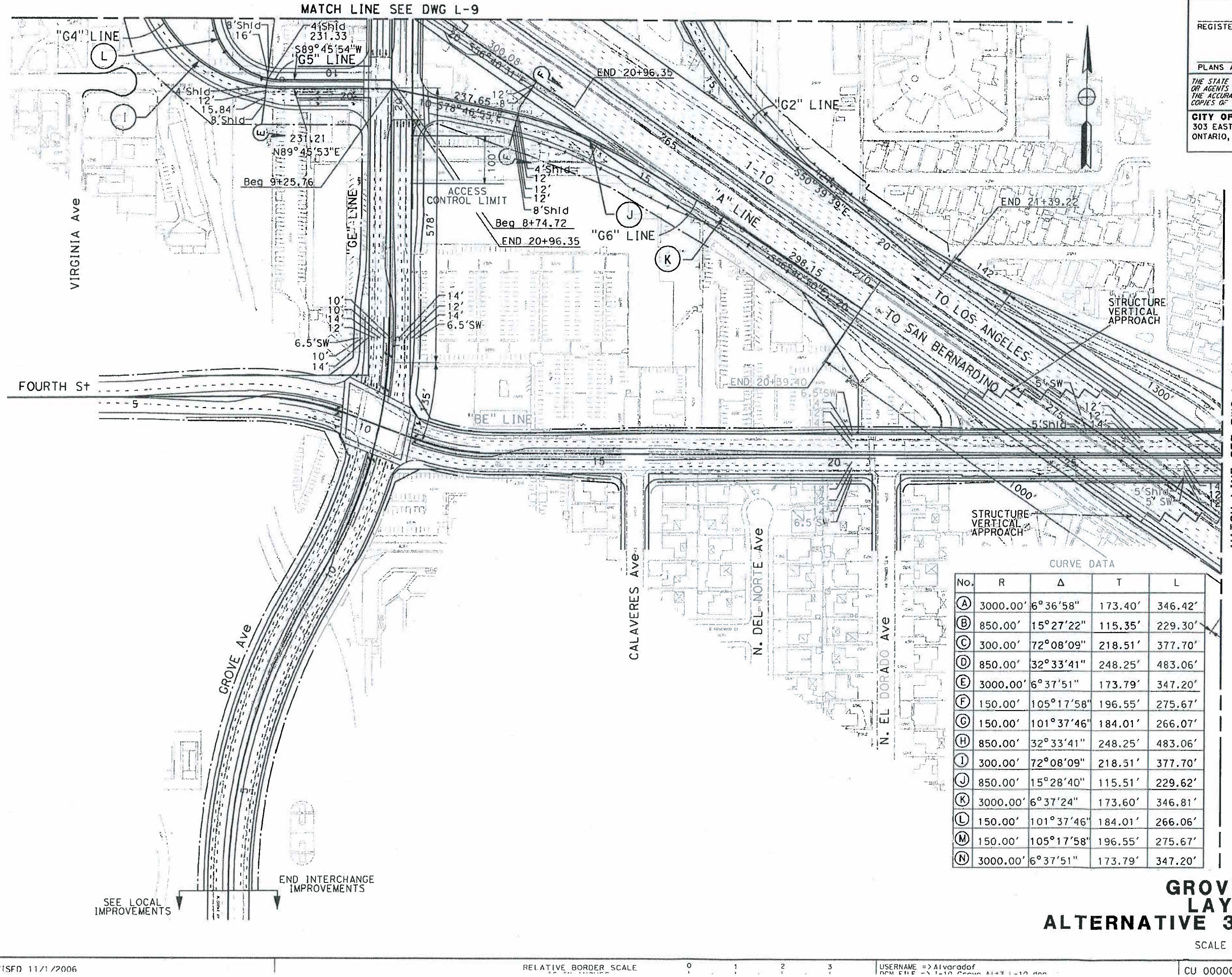

CURVE DATA

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(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'
(J)	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

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

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8	SBd	10	4.1/6.1	XXX	XXX

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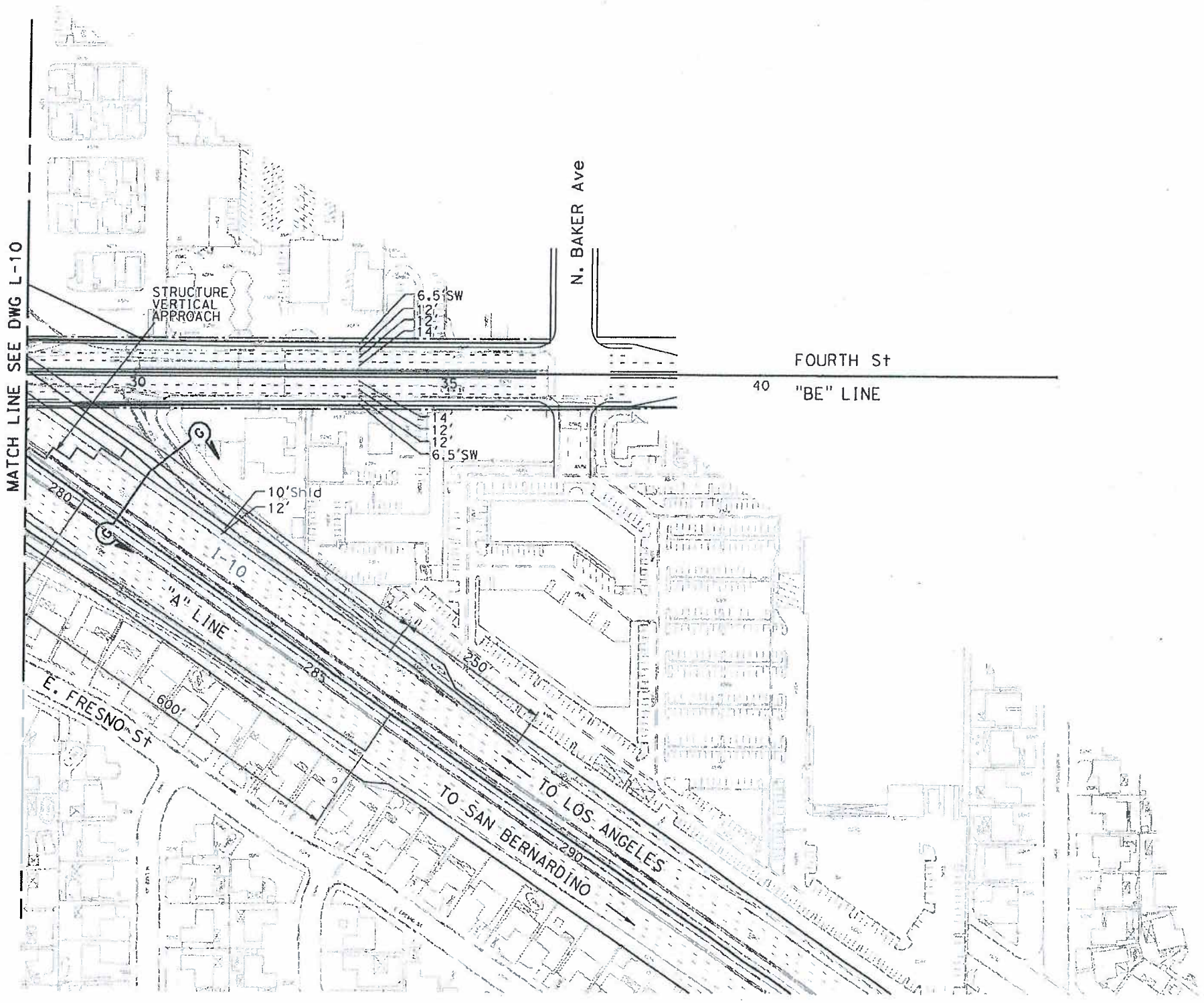


GROVE Ave
LAYOUT
ALTERNATIVE 3: PARCLO (L-9)

SCALE 1'=100'

L-11

LAST REVISION DATE PLOTTED => 9/16/2010

BORDER LAST REVISED 11/1/2006

RELATIVE BORDER SCALE 0 1 2 3

USERNAME => Alvaradof

CU 00000

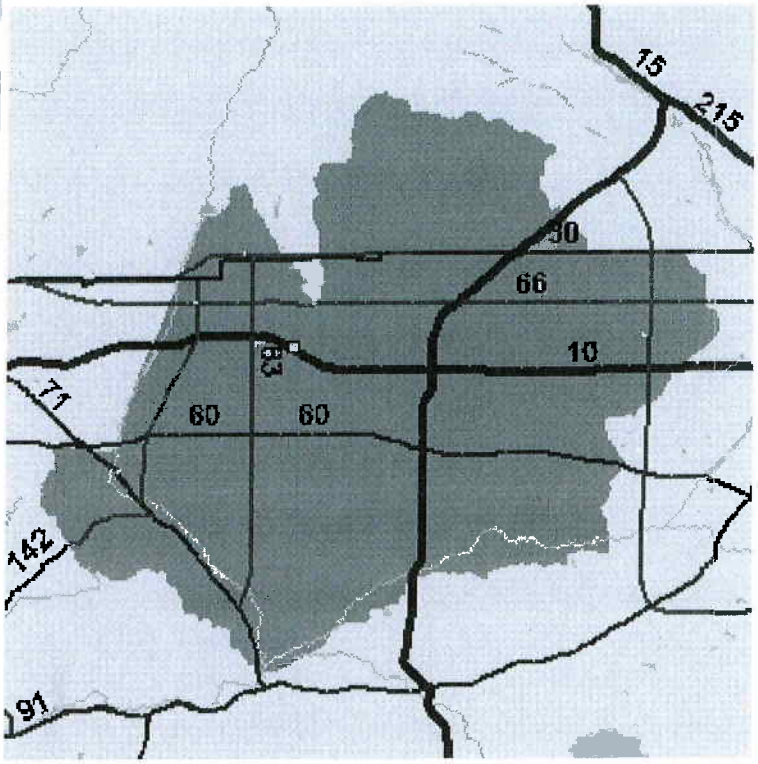
EA 0J400K

Attachment E

Hydrologic Sub-Area Data

Hydrologic Sub-Area 801.21

| HSA Information | TMDLs & 303(d) List | Water Quality Objectives | Caltrans Facilities | Caltrans Loads |



Topographic Map of the area around post mile SBD 10 5.000.
Aerial Photograph of the area around post mile SBD 10 5.000.
Help

HSA Information

Hydrologic Unit	SANTA ANA RIVER
Hydrologic Area	Middle Santa Ana River
Hydrologic Sub-Area	Chino (Split)
Watershed Area (acres)	190515
Average Annual Rainfall (inches)	18.2

Help

TMDLs & 303(d) Listed Waterbodies (2006 List)

Name	Pollutant	Source	Size	Status	Comments
Chino Creek Reach 1	Nutrients	Agriculture	7.8 Miles	TMDL Required	
Chino Creek Reach 1	Nutrients	Dairies	7.8 Miles	TMDL Required	
Chino Creek Reach 1	Pathogens	Agriculture	7.8 Miles	Being Addressed by USEPA Approved TMDLs	
Chino Creek Reach 1	Pathogens	Dairies	7.8 Miles	Being Addressed by USEPA Approved TMDLs	
Chino Creek Reach 1	Pathogens	Urban Runoff/Storm Sewers	7.8 Miles	Being Addressed by USEPA Approved TMDLs	
Chino Creek Reach 2	Coliform Bacteria	Unknown Nonpoint Source	2.5 Miles	Being Addressed by USEPA Approved TMDLs	
Cucamonga Creek, Valley Reach	Coliform Bacteria	Unknown Nonpoint Source	9.6 Miles	Being Addressed by USEPA Approved TMDLs	
Mill Creek (Prado Area)	Nutrients	Agriculture	1.6 Miles	TMDL Required	
Mill Creek (Prado Area)	Nutrients	Dairies	1.6 Miles	TMDL Required	
Mill Creek (Prado Area)	Pathogens	Dairies	1.6 Miles	Being Addressed by USEPA Approved TMDLs	
Mill Creek (Prado Area)	Total Suspended Solids (TSS)	Dairies	1.6 Miles	TMDL Required	
Prado Park Lake	Nutrients	Nonpoint Source	90 Acres	TMDL Required	
Prado Park Lake	Pathogens	Nonpoint Source	90 Acres	Being Addressed by USEPA Approved TMDLs	
Santa Ana River, Reach 3	Pathogens	Dairies	26 Miles	Being Addressed by USEPA Approved TMDLs	

Key: Water body on 303(d) list | Water body with a TMDL

Show only Targeted Design Constituents.

Help

Water Quality Objectives

The following waterbodies are in or near HSA 801.21. Click on the waterbody to get information on water quality objectives and beneficial uses

Waterbody Name
Aliso Creek
All other minor San Gabriel Mountain streams tributary to San Gabriel Valley

Angalls Stream - Tributaries to Angalls Stream

Angalls Stream - Tributary to Mill Creek (Prado Area)

Anza Park Drain

Bull Stream - Tributaries to Bull Stream

Bull Stream - Tributary to Mill Creek (Prado Area)

Cajon Canyon Streams - Tributaries to Cajon Canyon Streams

Cajon Canyon Streams - Tributary to Mill Creek (Prado Area)

Carbon Canyon Creek

Cascade Canyon Streams - Tributaries to Casacade Canyon Streams

Cascade Canyon Streams - Tributary to Mill Creek (Prado Area)

Cedar Stream - Tributaries to Casacade Cedar Stream

Cedar Stream - Tributary to Mill Creek (Prado Area)

Cherry Creeks - Tributaries to Cherry Creeks

Cherry Creeks - Tributary to Mill Creek (Prado Area)

Chino Creek Reach 1 - Santa Ana River confluence to beginning of concrete-lined channel south of Los Serranos Rd.

Chino Creek Reach 1 - Santa Ana River confluenceto beginning of concrete-lined channel south of Los Serranos Rd.

Chino Creek Reach 2 - Beginning of concrete lined channel south of Los Serranos Rd. to confluence with San Antonio Creek

Chino Creek Reach 2 - Santa Ana River confluence to beginning of concrete-lined channel south of Los Serranos Rd.

Cold Water Canyon Creek - Valley Reaches of Cold Water Canyon Creek - San Gabriel Mountain Streams (Mountain Reaches)

Coldwater Canyon Creek - San Gabriel Mountain Streams (Mountain Reaches)

Coyote Creek (within Santa Ana Regional boundary) - San Gabriel River Drainage

Cucamonga Creek

Cucamonga Creek Reach 1 - Confluence with Mill Creek to 23rd St. in Upland

Cucamonga Creek Reach 2 - (Mountain Reach) 23rd St. in Upland to headwaters

Day Creek

Day Creek - San Gabriel Mountain Streams (Mountain Reaches)

Day Creek - Valley Reaches of Day Creek - San Gabriel Mountain Streams (Mountain Reaches)

Deer Stream - Tributaries to Deer Stream

Deer Stream - Tributary to Mill Creek (Prado Area)

Demens Stream - Tributaries to Demens Stream

Demens Stream - Tributary to Mill Creek (Prado Area)

Duncan Canyon Streams - Tributaries to Duncan Canyon Streams

Duncan Canyon Streams - Tributary to Mill Creek (Prado Area)

East Etiwanda Creek

East Etiwanda Creek - San Gabriel Mountain Streams (Mountain Reaches)

East Etiwanda Creek - Valley Reaches of East Etiwanda Creek - San Gabriel Mountain Streams (Mountain Reaches)

Evans, Lake

Falling Rock Stream - Tributaries to Falling Rock Stream

Falling Rock Stream - Tributary to Mill Creek (Prado Area)

Fan Stream - Tributaries to Fan Stream

Fan Stream - Tributary to Mill Creek (Prado Area)

Henderson Canyon Streams - Tributaries to Henderson Canyon Streams

Henderson Canyon Streams - Tributary to Mill Creek (Prado Area)

Icehouse Canyon Streams - Tributaries to Icehouse Canyon Streams

Icehouse Canyon Streams - Tributary to Mill Creek (Prado Area)

Kerkhoff Stream - Tributaries to Kerkhoff Stream

Kerkhoff Stream - Tributary to Mill Creek (Prado Area)

Lake Evans - Upper Santa Ana River Basin

Lake Norconian - Upper Santa Ana River Basin

Lytle Creek - Valley Reaches of Lytle Creek (South,Middle, and North Forks) - San Gabriel Mountain Streams (Mountain Reaches)

Lytle creek (South, Middle and North Forks) and Coldwater Canyon Creek

Lytle Creek (South,Middle and North Forks) - San Gabriel Mountain Streams (Mountain Reaches)

Mill Creek (Prado Area)

Mockingbird Reservoir

Mockingbird Reservoir - Upper Santa Ana River Basin

Norconian, Lake

Offshore Zone - Water between Nearshore Zone and Limit of State Waters

Prado Flood Control Basin Wetland (Inland)

San Antonio Canyon Creek

San Antonio Creek

San Antonio Creek - Valley Reaches of Cold Water San Antonio Creek - San Gabriel Mountain Streams (Mountain Reaches)

San Antonio Creek - San Gabriel Mountain Streams (Mountain Reaches)

San Antonio Dam and Reservoir
San Sevaine Stream - Tributaries to San Sevaine Stream
San Sevaine Stream - Tributary to Mill Creek (Prado Area)
Santa Ana River, Reach 3-Prado Dam to Mission Blvd. In Riverside
Santa Ana River, Reach 4-Mission Blvd. In Riverside to San Jacinto Fault in San Bernardino
Stoddard Canyon Streams - Tributary to Mill Creek (Prado Area)
Sunnyslope Cahnnel
Telegraph Canyon Streams - Tributaries to Telegraph Canyon Streams
Telegraph Canyon Streams - Tributary to Mill Creek (Prado Area)
Temescal Creek Reach 1A - Santa Ana River confluence to Lincoln Ave.
Temescal Creek Reach 1B Lincoln Ave. to Riverside Canal
Tequesquite Arroyo (Sycamore Creek)
Thorpe Stream - Tributaries to Thorpe Stream
Thorpe Stream - Tributary to Mill Creek (Prado Area)

Help

Caltrans Facilities

Maintenance Stations

Name	Address
Ontario	1165 E Philadelphia Street

Freeways and Highways

Route	Length (miles)
10	18.5
15	16.6
30	14.4
60	17.4
66	18.2
71	10.9
83	14
142	3.6
210	5.6

Park and Rides

Rest Areas

Name	District	County	Route	Post Mile
VAN BUREN	8	RIV	60	R1.7
RANCHO CUCAMONGA	8	SBD	15	6.691
MONTCLAIR TRANSCENTER	8	SBD	10	0.7
CHINO	8	SBD	71	R1.091
COUNTRY VILLAGE	8	RIV	60	R3.05
MIRA LOMA	8	RIV	15	48.266

Name	District	County	Route	Post Mile

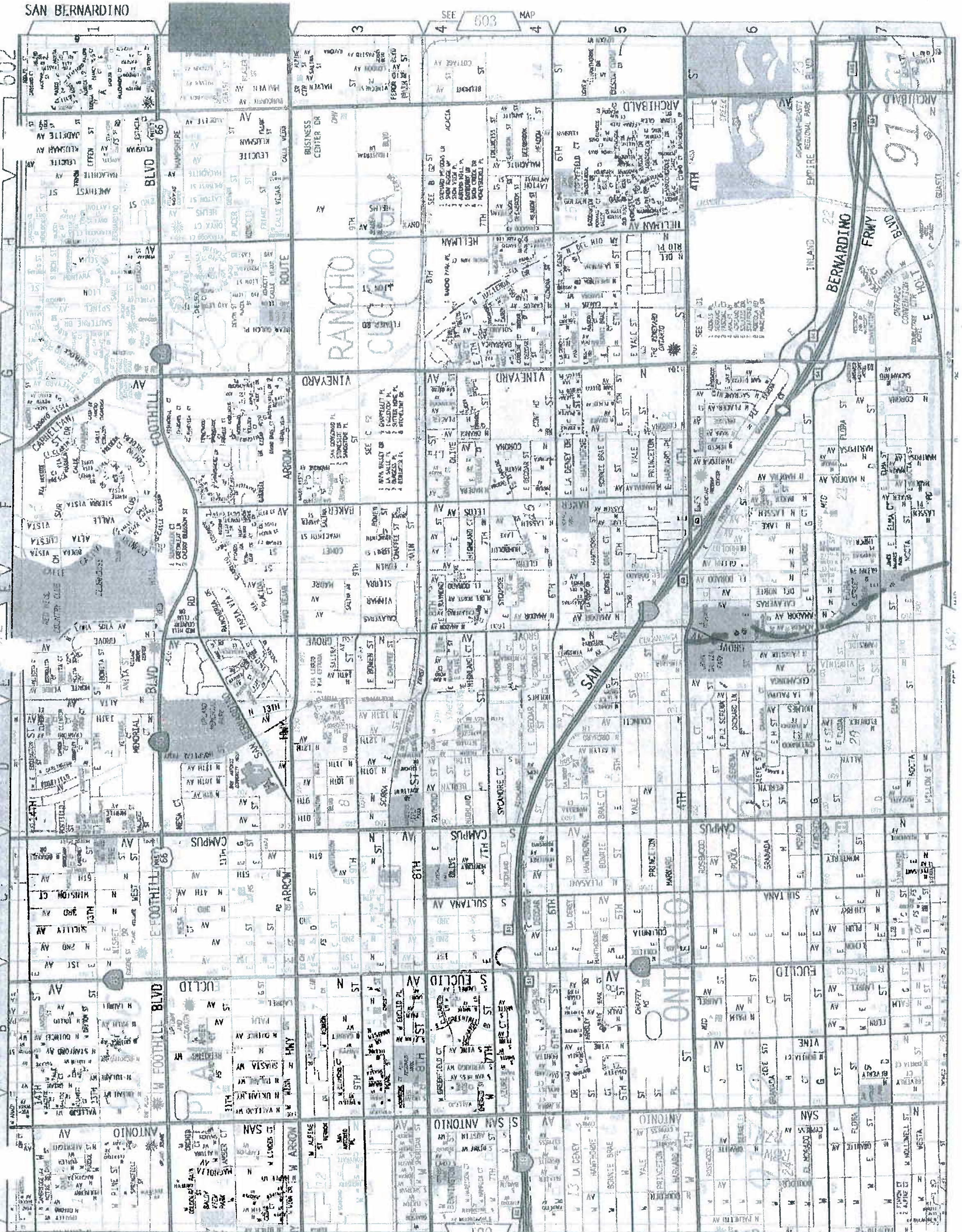
Help

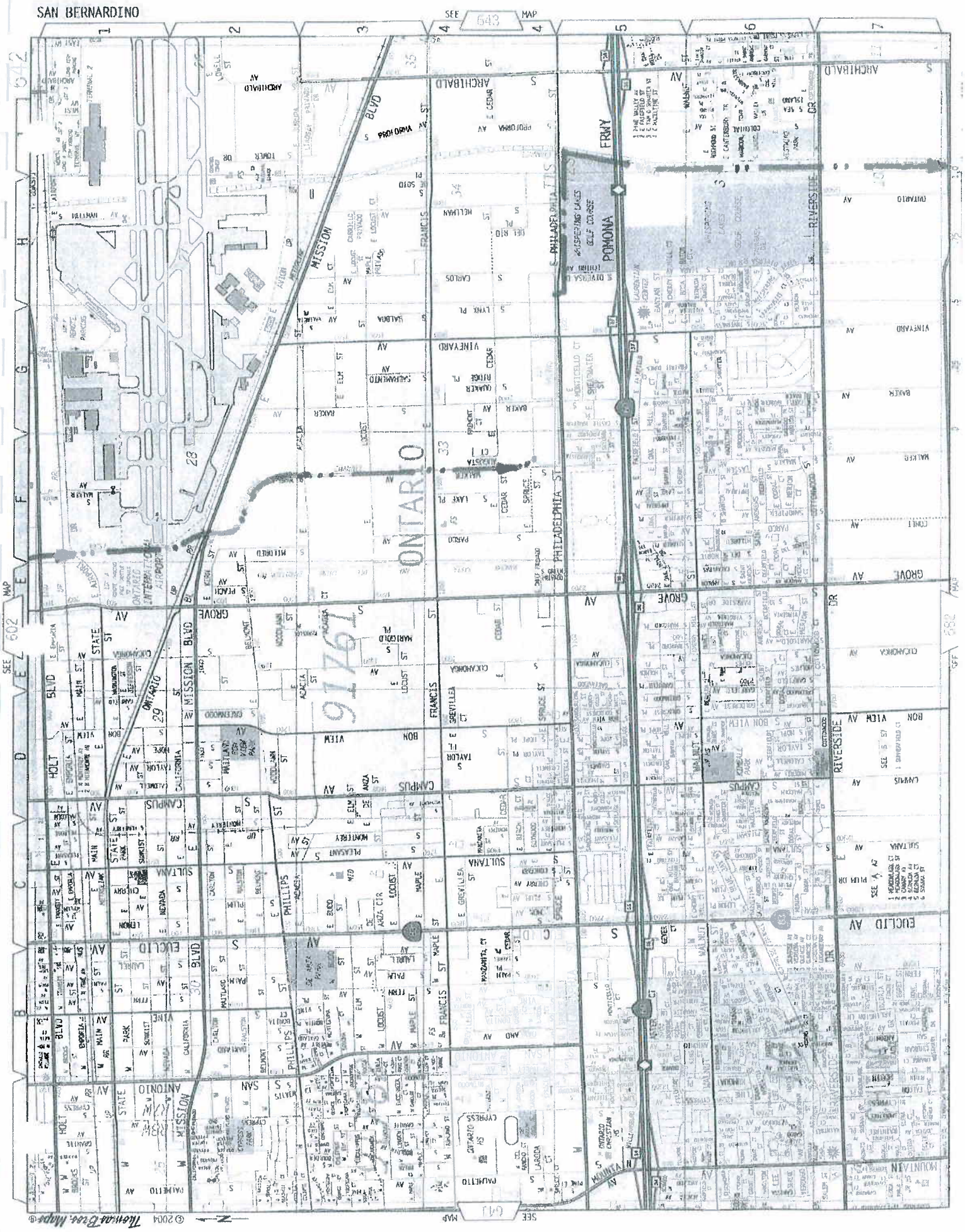
Caltrans Storm Water Loads

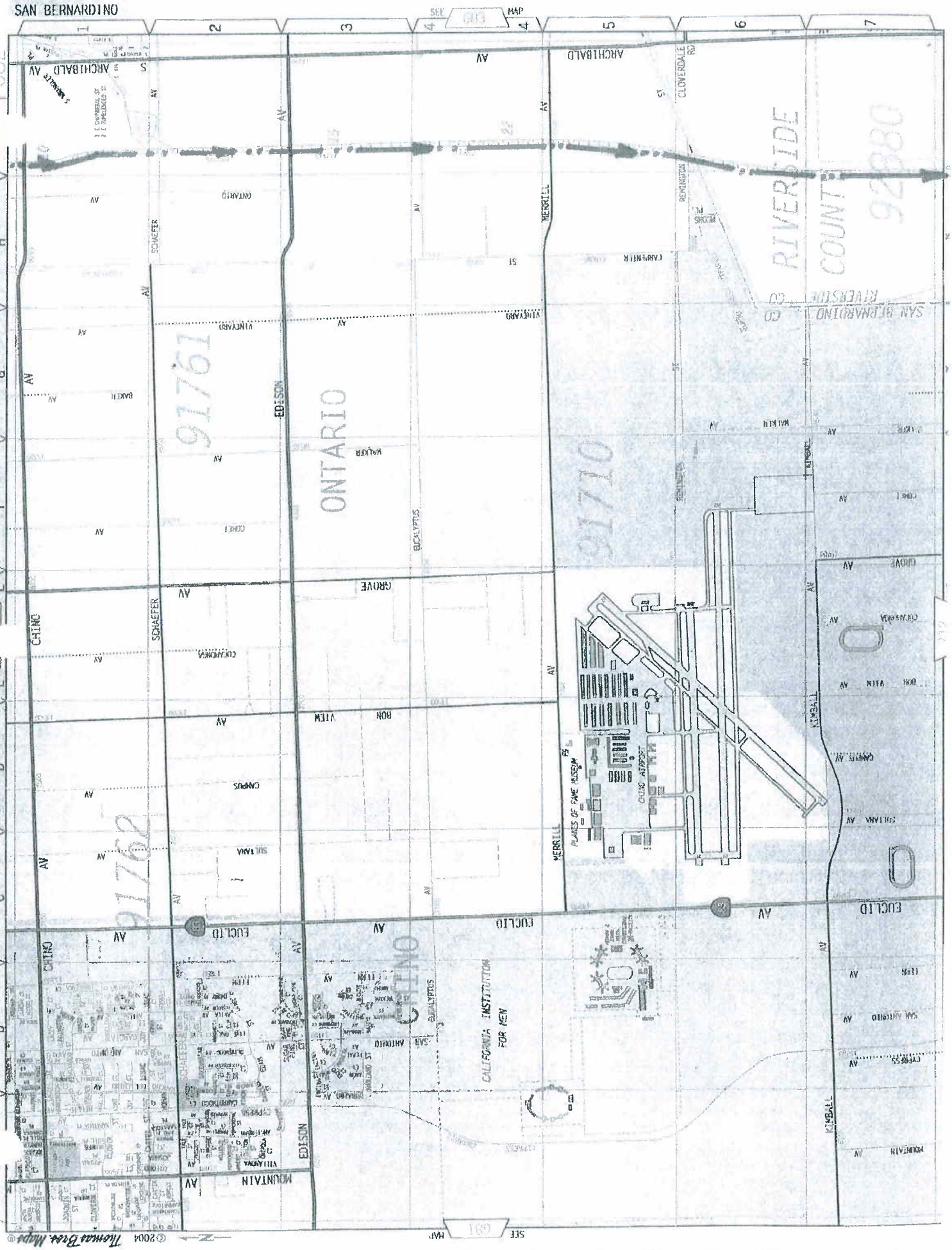
The estimated annual average loads from Caltrans facilities in a HSA are located here. These loads are for preliminary planning purposes and for scenario comparisons. The loads are from untreated impervious surfaces only. Unpaved areas along highways right-of-ways are not included in the calculations. See the help page for details.

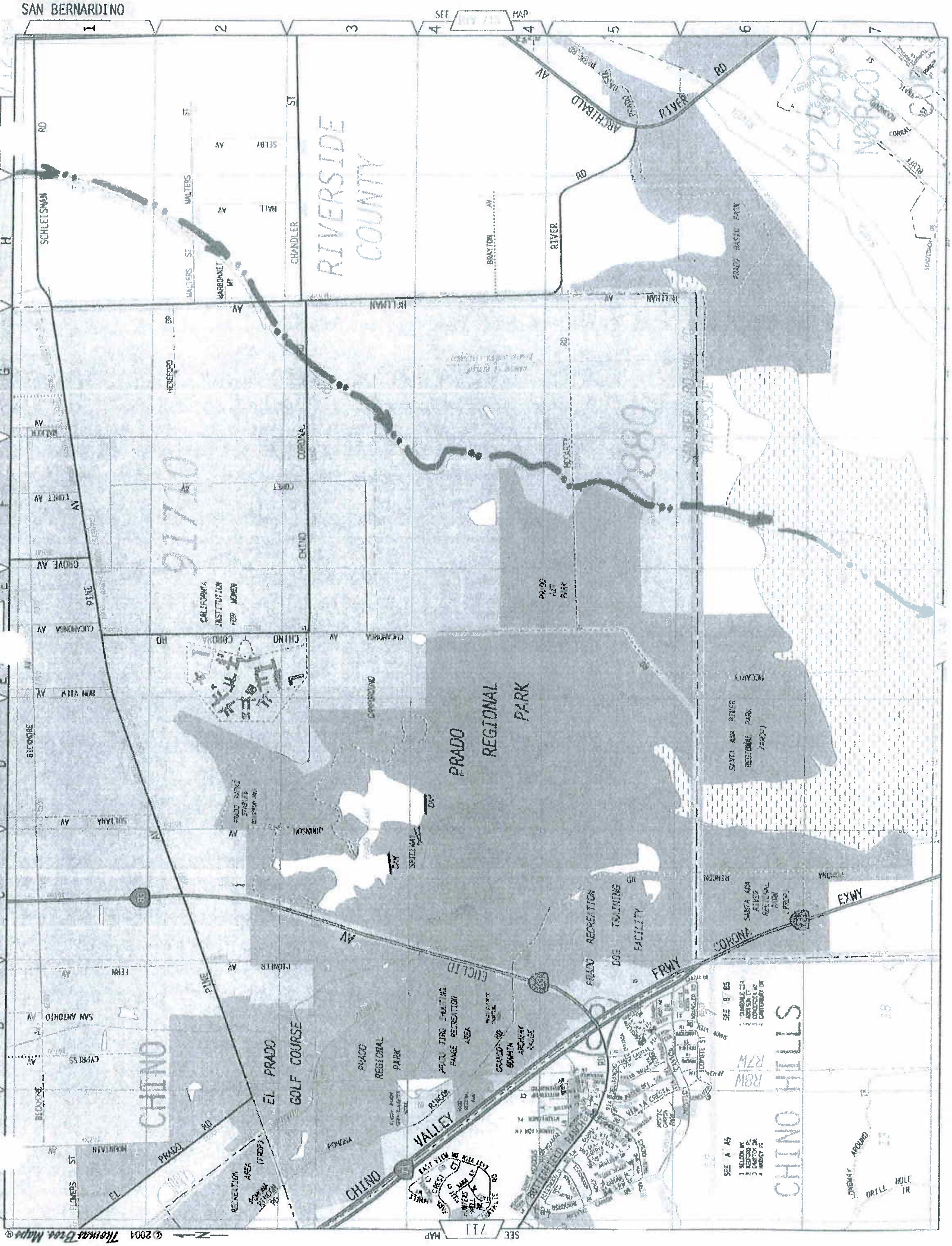
Attachment F

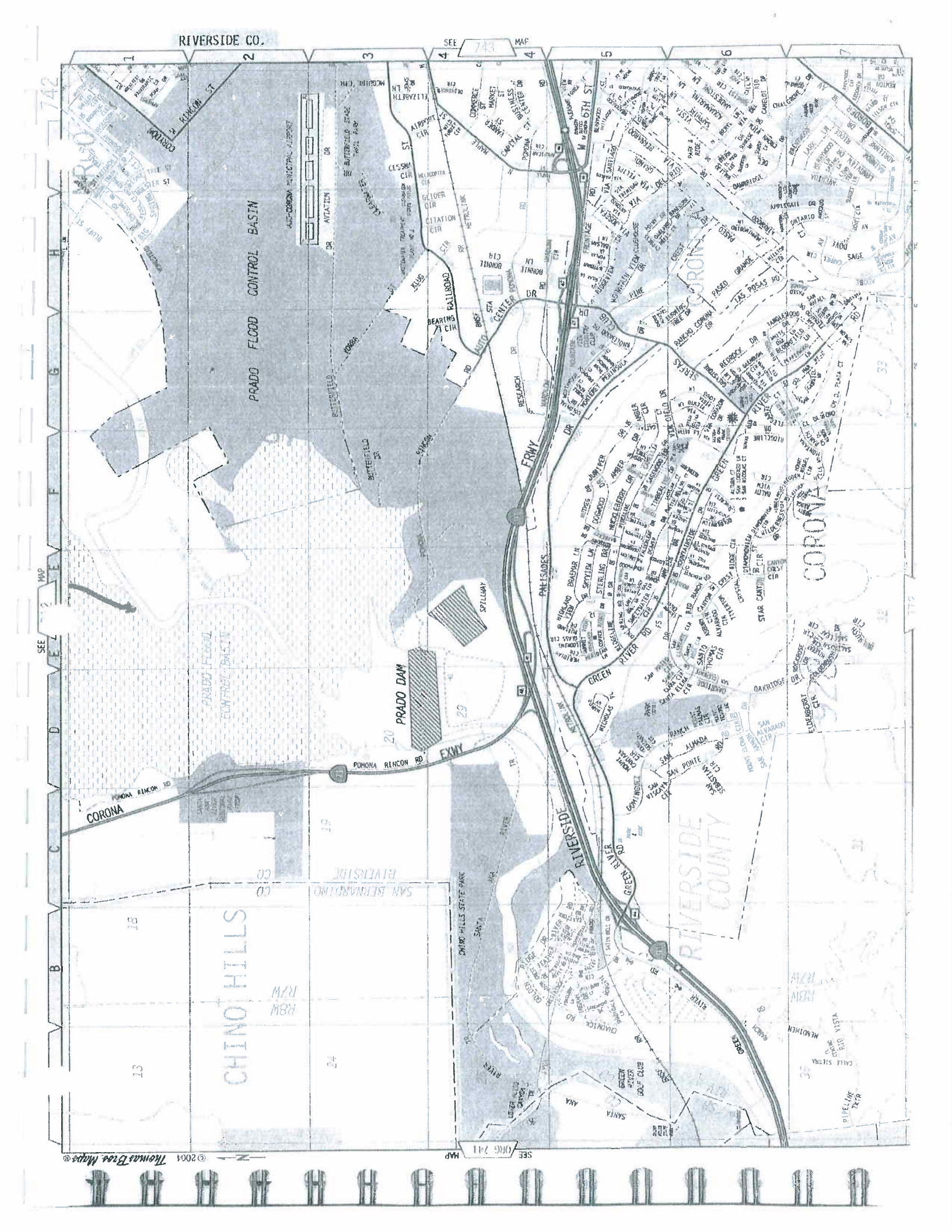
Flowpath from Project Site to Outfall Area


602
SEE 603 MAP
SEE 601 MAP
SEE 572 MAP
RANCHO CUCAMONGA
ONTARIO
FOOTHILL BLVD
EUCLID AV
CAMPUS AV
VINEYARD AV
ARCHIBALD AV
BERNARDINO FRWY
INLAND EMPIRE BLVD
SAN ANTONIO AV
ARROW ROUTE
GROVE AV
HELLMAN AV
SULTANA AV
Thomas Bros. Maps © 2004


SAN BERNARDINO
ONTARIO
POMONA
RIVERSIDE
MISSION BLVD
HOLT BLVD
EUCLID AV
GROVE AV
CAMPUS AV
ARCHIBALD
VINEYARD
PHILADELPHIA ST
FRWY
91761


SAN BERNARDINO
RIVERSIDE COUNTY
ONTARIO
91761
91710
91762
ARCHIBALD AV
SCHAEFER
EDISON
MERRILL
CHINO
EUCLID
KIMBALL
GROVE
CAMPUS
VINEYARD
CARPENTER
CLOVERDALE RD
CALIFORNIA INSTITUTION FOR MEN
PLANES OF FAME MUSEUM
ONTARIO INTERNATIONAL AIRPORT
MOUNTAIN
EUCALYPTUS
SEE MAP 682
SEE MAP 681
© 2004 Thomas Bros. Maps®


SAN BERNARDINO
RIVERSIDE COUNTY
PRADO REGIONAL PARK
EL PRADO GOLF COURSE
CHINO
CHINO HILLS
NORCO
91710
92880
CALIFORNIA INSTITUTION FOR WOMEN
PRADO RECREATION DOG TRAINING FACILITY
SANTA ANA RIVER REGIONAL PARK (PROP)
PRADO BASIN PARK
SCHLEISMAN RD
CHANDLER ST
ARCHIBALD AV
RIVER RD
HELLMAN AV
EUCLID AV
PINE AV
CHINO VALLEY FRWY
CORONA EXWY
EL PRADO RD
SEE 711 MAP
© 2004 Thomas Bros. Maps


RIVERSIDE CO.
SEE MAP 743
PRADO FLOOD CONTROL BASIN
PRADO DAM
SPILLWAY
FRWY
CORONA
RIVERSIDE
RIVERSIDE COUNTY
CHINO HILLS
CHINO HILLS STATE PARK
POMONA RINCON RD
RIVER RD
GREEN RIVER GOLF CLUB
SEE MAP 711
© 2004 Thomas Bros. Maps

Attachment G

Checklists SW-1, SW-2, & SW-3

Checklist SW-1, Site Data Sources

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10

PM (KP): 4.1/6.1 EA: 0J400K

RWQCB: Santa Ana

Information for the following data categories should be obtained, reviewed and referenced as necessary throughout the project planning phase. Collect any available documents pertaining to the category and list them and reference your data source. For specific examples of documents within these categories, refer to Section 5.5 of this document. Example categories have been listed below; add additional categories, as needed. Summarize pertinent information in Section 2 of the SWDR.

DATA CATEGORY/SOURCES	Date
Topographic	
• USGS Quad Map	
• Aerial Photogrammetry, Coast Surveying, Inc. http://www.coastsurvey.com	May 2008
•	
Hydraulic	
• San Bernardino County Hydrology Manual	1986 with
•	April 2010 Addendum
•	
Soils	
• Diaz-Yourman & Associates, Preliminary Materials Report, Grove Avenue Corridor Project, Project No. ST0302	January 2010
•	
•	
Climatic	
• National Weather Service	June 2009
• http://www.wrh.noaa.gov/lox/climate/climate_intro.php	
•	
Water Quality	
• Construction Site BMP Manual, March 2003 http://dot.ca.gov/hq/construc/stormwater/CSBMPM_303_Final.pdf	March 2008
• TMDL data - Office of Water Programs, CSU Sacramento- Water Quality Planning Tool, http://www.stormwater.water-programs.com/wqpt.htm	March 2009

Checklist SW-2, Storm Water Quality Issues Summary

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
PM (KP): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

The following questions provide a guide to collecting critical information relevant to project stormwater quality issues. Complete responses to applicable questions, consulting other Caltrans functional units (Environmental, Landscape Architecture, Maintenance, etc.) and the District/Regional Storm Water Coordinator as necessary. Summarize pertinent responses in Section 2 of the SWDR.

1. Determine the receiving waters that may be affected by the project throughout the project life cycle (i.e., construction, maintenance and operation).	☒Complete	☐NA
2. For the project limits, list the 303(d) impaired receiving water bodies and their constituents of concern.	☒Complete	☐NA
3. Determine if there are any municipal or domestic water supply reservoirs or groundwater percolation facilities within the project limits. Consider appropriate spill contamination and spill prevention control measures for these new areas.	☒Complete	☐NA
4. Determine the RWQCB special requirements, including TMDLs, effluent limits, etc.	☒Complete	☐NA
5. Determine regulatory agencies seasonal construction and construction exclusion dates or restrictions required by federal, state, or local agencies.	☒Complete	☐NA
6. Determine if a 401 certification will be required.	☒Complete	☐NA
7. List rainy season dates. October 1 to May 1	☒Complete	☐NA
8. Determine the general climate of the project area. Identify annual rainfall and rainfall intensity curves.	☒Complete	☐NA
9. If considering Treatment BMPs, determine the soil classification, permeability, erodibility, and depth to groundwater.	☒Complete	☐NA
10. Determine contaminated or hazardous soils within the project area.	☐Complete	☐NA
11. Determine the total disturbed soil area of the project.	☒Complete	☐NA
12. Describe the topography of the project site.	☒Complete	☐NA
13. List any areas outside of the Caltrans right-of-way that will be included in the project (e.g. contractor's staging yard, work from barges, easements for staging, etc.).	☒Complete	☐NA
14. Determine if additional right-of-way acquisition or easements and right-of-entry will be required for design, construction and maintenance of BMPs. If so, how much?	☒Complete	☐NA
15. Determine if a right-of-way certification is required.	☒Complete	☐NA
16. Determine the estimated unit costs for right-of-way should it be needed for Treatment BMPs, stabilized conveyance systems, lay-back slopes, or interception ditches.	☒Complete	☐NA
17. Determine if project area has any slope stabilization concerns.	☒Complete	☐NA
18. Describe the local land use within the project area and adjacent areas.	☒Complete	☐NA
19. Evaluate the presence of dry weather flow.	☒Complete	☐NA

Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water Impacts

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
PM (KP): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

The PE must confer with other functional units, such as Landscape Architecture, Hydraulics, Environmental, Materials, Construction and Maintenance, as needed to assess these issues. Summarize pertinent responses in Section 2 of the SWDR.

Options for avoiding or reducing potential impacts during project planning include the following:

1.	Can the project be relocated or realigned to avoid/reduce impacts to receiving waters or to increase the preservation of critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions?	☐Yes	☒No	☐NA
2.	Can structures and bridges be designed or located to reduce work in live streams and minimize construction impacts?	☐Yes	☒No	☐NA
3.	Can any of the following methods be utilized to minimize erosion from slopes:			
	a. Disturbing existing slopes only when necessary?	☒Yes	☐No	☐NA
	b. Minimizing cut and fill areas to reduce slope lengths?	☒Yes	☐No	☐NA
	c. Incorporating retaining walls to reduce steepness of slopes or to shorten slopes?	☒Yes	☐No	☐NA
	d. Acquiring right-of-way easements (such as grading easements) to reduce steepness of slopes?	☒Yes	☐No	☐NA
	e. Avoiding soils or formations that will be particularly difficult to re-stabilize?	☒Yes	☐No	☐NA
	f. Providing cut and fill slopes flat enough to allow re-vegetation and limit erosion to pre-construction rates?	☒Yes	☐No	☐NA
	g. Providing benches or terraces on high cut and fill slopes to reduce concentration of flows?	☒Yes	☐No	☐NA
	h. Rounding and shaping slopes to reduce concentrated flow?	☒Yes	☐No	☐NA
	i. Collecting concentrated flows in stabilized drains and channels?	☒Yes	☐No	☐NA
4.	Does the project design allow for the ease of maintaining all BMPs?	☒Yes	☐No	
5.	Can the project be scheduled or phased to minimize soil-disturbing work during the rainy season?	☒Yes	☐No	
6.	Can permanent storm water pollution controls such as paved slopes, vegetated slopes, basins, and conveyance systems be installed early in the construction process to provide additional protection and to possibly utilize them in addressing construction storm water impacts?	☒Yes	☐No	☐NA

Attachment H

Checklists DPP-1, Parts 1-5

Design Pollution Prevention BMPs
Checklist DPP-1, Part 1

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
PM (KP): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

Consideration of Design Pollution Prevention BMPs

1. Consideration of Downstream Effects Related to Potentially Increased Flow [to streams or channels]?

(a) Will project increase velocity or volume of downstream flow?	☒Yes	☐No	☐NA
(b) Will the project discharge to unlined channels?	☐Yes	☒No	☐NA
(c) Will project increase potential sediment load of downstream flow?	☐Yes	☒No	☐NA
(d) Will project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect downstream channel stability?	☐Yes	☒No	☐NA

If Yes was answered to any of the above questions, consider ***Downstream Effects Related to Potentially Increased Flow***, complete the DPP-1, Part 2 checklist.

2. Slope/Surface Protection Systems

(a) Will project create new slopes or modify existing slopes?	☒Yes	☐No	☐NA

If Yes was answered to the above question, consider ***Slope/Surface Protection Systems***, complete the DPP-1, Part 3 checklist.

3. Concentrated Flow Conveyance Systems

(a) Will the project create or modify ditches, dikes, berms, or swales?	☒Yes	☐No	☐NA
(b) Will project create new slopes or modify existing slopes?	☒Yes	☐No	☐NA
(c) Will it be necessary to direct or intercept surface runoff?	☒Yes	☐No	☐NA
(d) Will cross drains be modified?	☐Yes	☒No	☐NA

If Yes was answered to any of the above questions, consider ***Concentrated Flow Conveyance Systems***; complete the DPP-1, Part 4 checklist.

4. Preservation of Existing Vegetation

a) It is the goal of the Storm Water Program to maximize the protection of desirable existing vegetation to provide erosion and sediment control benefits on all projects. ☒Complete

Consider ***Preservation of Existing Vegetation***, complete the DPP-1, Part 5 checklist.

Design Pollution Prevention BMPs
Checklist DPP-1, Part 2

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
PM (KP): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

Downstream Effects Related to Potentially Increased Flow

1. Review total paved area and reduce to the maximum extent practicable. ☒Complete
2. Review channel lining materials and design for stream bank erosion control. ☒Complete
   (a) See Chapters 860 and 870 of the HDM. ☒Complete
   (b) Consider channel erosion control measures within the project limits as well as downstream. Consider scour velocity. ☒Complete
3. Include, where appropriate, energy dissipation devices at culvert outlets. ☒Complete
4. Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour. ☒Complete
5. Include, if appropriate, peak flow attenuation basins to reduce peak discharges. ☒Complete

Design Pollution Prevention BMPs
Checklist DPP-1, Part 3

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
PM (KP): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

Slope / Surface Protection Systems

What are the proposed areas of cut and fill? (attach plan or map)	☒Complete
Were benches or terraces provided on high cut and fill slopes to reduce concentration of flows?	☒Yes ☐No
Were slopes rounded and/or shaped to reduce concentrated flow?	☒Yes ☐No
Were concentrated flows collected in stabilized drains or channels?	☒Yes ☐No
Are slopes > 1:4 vertical:horizontal (V:H))?	☐Yes ☒No
If Yes, District Landscape Architecture must prepare or approve an erosion control plan.	
Are slopes > 1:2 (V:H)?	☐Yes ☒No
If Yes, Geotechnical Services must prepare a Geotechnical Design Report, and the District Landscape Architect should prepare or approve an erosion control plan. Concurrence must be obtained from the District Maintenance Storm Water Coordinator for slopes steeper than 1:2 (V:H).	
Estimate the change to the impervious areas that will result from this project. Decrease by 11.6acres	☒Complete

VEGETATED SURFACES

1. Identify existing vegetation.	☒Complete
2. Evaluate site to determine soil types, appropriate vegetation and planting strategies.	☒Complete
3. How long will it take for permanent vegetation to establish?	☒Complete
4. Minimize overland and concentrated flow depths and velocities.	☒Complete

HARD SURFACES

1. Are hard surfaces required?	☐Yes ☒No
If Yes, document purpose (safety, maintenance, soil stabilization, etc.), types, and general locations of the installations.	☐Complete
Review appropriate SSPs for Vegetated Surface and Hard Surface Protection Systems.	☐Complete

Design Pollution Prevention BMPs
Checklist DPP-1, Part 4

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
PM (KP): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

Concentrated Flow Conveyance Systems

Ditches, Berms, Dikes and Swales

1. Consider Ditches, Berms, Dikes, and Swales as per Chapters 813, 836, and 860 of the HDM. ☒Complete
2. Evaluate risks due to erosion, overtopping, flow backups or washout. ☒Complete
3. Consider outlet protection where localized scour is anticipated. ☒Complete
4. Examine the site for run-on from off-site sources. ☒Complete
5. Consider channel lining when velocities exceed scour velocity for soil. ☒Complete

Overside Drains

1. Consider downdrains, as per Index 834.4 of the HDM. ☒Complete
2. Consider paved spillways for side slopes flatter than 1:4 V:H. ☒Complete

Flared Culvert End Sections

1. Consider flared end sections on culvert inlets and outlets as per Chapter 827 of the HDM. ☒Complete

Outlet Protection/Velocity Dissipation Devices

1. Consider outlet protection/velocity dissipation devices at outlets, including cross drains, as per Chapters 827 and 870 of the HDM. ☒Complete

Review appropriate SSPs for Concentrated Flow Conveyance Systems. ☒Complete

Design Pollution Prevention BMPs
Checklist DPP-1, Part 5

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
PM (KP): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

Preservation of Existing Vegetation

1.	Review Preservation of Property, Standard Specifications 16.1.01 and 16-1.02 (Clearing and Grubbing) to reduce clearing and grubbing and maximize preservation of existing vegetation.	☒Complete
2.	Has all vegetation to be retained been coordinated with Environmental, and identified and defined in the contract plans?	☐Yes ☒No
3.	Have steps been taken to minimize disturbed areas, such as locating temporary roadways to avoid stands of trees and shrubs and to follow existing contours to reduce cutting and filling?	☒Complete
4.	Have impacts to preserved vegetation been considered while work is occurring in disturbed areas?	☒Yes ☐No
5.	Are all areas to be preserved delineated on the plans?	☐Yes ☒No

Attachment I

Checklists T-1, Parts 1-10

Treatment BMPs

Checklist T-1, Part 1

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10

PM (KP): 4.1/6.1 EA: 0J400K

RWQCB: Santa Ana

Consideration of Treatment BMPs

This checklist is used for projects that require the consideration of Approved Treatment BMPs, as determined from the process described in Section 4 (Project Treatment Consideration) and the Evaluation Documentation Form (EDF). This checklist will be used to determine which Treatment BMPs should be considered for each watershed and sub-watersheds within the project. Supplemental data will be needed to verify siting and design applicability for final incorporation into a project.

Complete this checklist for each phase of the project, when considering Treatment BMPs. Use the responses to the questions as the basis when developing the narrative in Section 5 of the Storm Water Data Report to document that Treatment BMPs have been appropriately considered.

Answer all questions, unless otherwise directed.

1. Dry Weather Flow Diversion

   (a) Are dry weather flows generated by Caltrans anticipated to be persistent? ☐Yes ☒No

   (b) Is a sanitary sewer located on or near the site? ☒Yes ☐No

   (c) Is the connection to the sanitary sewer possible without extraordinary plumbing, features or construction practices? ☒Yes ☐No

   (d) Is the domestic wastewater treatment authority willing to accept flow? ☐Yes ☒No

   If Yes was answered to all of these questions consider Dry Weather Flow Diversion, complete and attach Part 3 of this checklist

2. Is the receiving water on the 303(d) list for litter/trash or has a TMDL been issued for litter/trash? ☐Yes ☒No

   If Yes, consider Gross Solids Removal Devices (GSRDs), complete and attach Part 6 of this checklist. Note: Biofiltration Systems, Infiltration Devices, Detention Devices, Media Filters, MCTTs, and Wet Basins also can capture litter – consult with District/Regional NPDES if these devices should be considered to meet litter/trash TMDL.

3. Is project located in an area (e.g., mountain regions) where traction sand is applied more than twice a year? ☐Yes ☒No
   If Yes, consider ***Traction Sand Traps***, complete and attach **Part 7** of this checklist.

Treatment BMPs

Checklist T-1, Part 2

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10

PM (KP): 4.1/6.1 EA: 0J400K

RWQCB: Santa Ana

Biofiltration Swales / Biofiltration Strips

Feasibility

1. Do the climate and site conditions allow vegetation to be established? ☒Yes ☐No

2. Are flow velocities < 4 fps (i.e. low enough to prevent scour of the vegetated bioswale as per HDM Table 873.3E)? ☒Yes ☐No

   If No to either question above, Biofiltration Swales and Biofiltration Strips are not feasible.

3. Are Biofiltration Swales proposed at sites where known hazardous soils or contaminated groundwater plumes exist? ☐Yes ☒No
   If Yes, consult with District/Regional NPDES Coordinator about how to proceed.

4. Does adequate area exist within the right-of-way to place biofiltration device(s)? ☒Yes ☐No
   If Yes, continue to the Design Elements section. If No, continue to Question 5.

5. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Biofiltration Devices and how much right-of way would be needed to treat WQF? _____ acres ☐Yes ☐No
   If Yes, continue to Design Elements section. If No, continue to Question 6.

6. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of these Treatment BMPs into the project. ☐Complete

Design Elements

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1. Has the District Landscape Architect provided vegetation mixes appropriate for climate and location? * **Will Comply in PS&E phase.** ☐Yes ☒No

Treatment BMPs
Checklist T-1, Part 3

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
PM (KP): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

Dry Weather Flow Diversion

Feasibility

1. Is dry-weather flow diversion acceptable to a Publicly Owned Treatment Works (POTW)? ☐Yes ☒No
2. Would a connection require ordinary (i.e., not extraordinary) plumbing, features or construction methods to implement? ☐Yes ☒No

   If No to either question above, Dry Weather Flow Diversion is not feasible.

3. Does adequate area exist within the right-of-way to place Dry Weather Flow Diversion devices? ☐Yes ☐No
   If Yes, continue to Design Elements sections. If No, continue to Question 4.
4. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Dry Weather Flow Diversion devices and how much right-of way would be needed? _____ (acres) ☐Yes ☐No
   If Yes, continue to the Design Elements section.

   If No, continue to Question 5.
5. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

Design Elements

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1. Does the existing sanitary sewer pipeline have adequate capacity to accept project dry weather flows, or can an upgrade be implemented to handle the anticipated dry weather flows within the project's budget and objectives? * ☐Yes ☐No
2. Can the connection be designed to allow for Maintenance vehicle access? * ☐Yes ☐No
3. Can gate, weir, or valve be designed to stop diversion during storm events? * ☐Yes ☐No
4. Can the inlet be designed to reduce chances of clogging the diversion pipe or channel? * ☐Yes ☐No
5. Can a back flow prevention device be designed to prevent sanitary sewage from entering storm drain? * ☐Yes ☐No

Treatment BMPs
Checklist T-1, Part 4

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
PM (KP): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

Infiltration Devices

Feasibility

1.	Does local Basin Plan or other local ordinance provide influent limits on quality of water that can be infiltrated, and would infiltration pose a threat to groundwater quality as determined by the District/Regional NPDES Storm Water Coordinator?	☐Yes	☒No
2.	Does infiltration at the site compromise the integrity of any slopes in the area?	☐Yes	☒No
3.	Per survey data or U.S. Geological Survey (USGS) Quad Map, are existing slopes at the proposed device site >15%?	☐Yes	☒No
4.	At the invert, does the soil type classify as NRCS Hydrologic Soil Group (HSG) D, or does the soil have an infiltration rate < 0.5 inches/hr?	☐Yes	☒No
5.	Is site located over a previously identified contaminated groundwater plume?	☐Yes	☒No
	If Yes to any question above, Infiltration Devices are not feasible; stop here and consider other approved Treatment BMPs.		
6.	(a) Does site have groundwater within 10 ft of basin invert?	☐Yes	☒No
	(b) Does site investigation indicate that the infiltration rate is significantly greater than 2.5 inches/hr? **Will perform the test in PS&E phase.**	☐Yes	☐No
	If Yes to either part of Question 6, the RWQCB must be consulted, and the RWQCB must conclude that the groundwater quality will not be compromised, before approving the site for infiltration.	☐Yes	☐No
7.	Does adequate area exist within the right-of-way to place Infiltration Device(s)? If Yes, continue to Design Elements sections. If No, continue to Question 8.	☒Yes	☐No
8.	If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Infiltration Devices and how much right-of way would be needed to treat WQV? _____ acres	☐Yes	☐No
	If Yes, continue to Design Elements section.		
	If No, continue to Question 9.		
9.	If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project.	☐Complete	

Treatment BMPs
Checklist T-1, Part 5

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
PM (KP): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

Detention Devices

Feasibility

1. Is there sufficient head to prevent objectionable backwater conditions in the upstream drainage systems? **Will verify in PS&E phase.** ☐Yes ☐No

2. 2a) Is the volume of the Detention Device equal to at least the WQV? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet]) ☒Yes ☐No

   Only answer (b) if the Detention Device is being used also to capture traction sand.

   2b) Is the total volume of the Detention Device at least equal to the WQV and the anticipated volume of traction sand, while maintaining a minimum 12 inch freeboard (1 ft)? ☒Yes ☐No

3. Is basin invert ≥ 10 ft above seasonally high groundwater or can it be designed with an impermeable liner? (Note: If an impermeable liner is used, the seasonally high groundwater elevation must not encroach within 12 inches of the invert.) ☒Yes ☐No

If No to any question above, then Detention Devices are not feasible.

4. Does adequate area exist within the right-of-way to place Detention Device(s)? ☒Yes ☐No

   If Yes, continue to the Design Elements section. If No, continue to Question 5.

5. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Detention Device(s) and how much right-of way would be needed to treat WQV? _____ acres ☐Yes ☐No
   If Yes, continue to the Design Elements section. If No, continue to Question 6.

6. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

Treatment BMPs
Checklist T-1, Part 6

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
KP (PM): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

Gross Solids Removal Devices (GSRDs)

Feasibility

1. Is the receiving water body downstream of the tributary area to the proposed GSRD on a 303(d) list or has a TMDL for litter been established? ☐Yes ☒No

2. Are the devices sized for flows generated by the peak drainage facility design event or can peak flow be diverted? ☒Yes ☐No

3. Are the devices sized to contain gross solids (litter and vegetation) for a period of one year? ☒Yes ☐No

4. Is there sufficient access for maintenance and large equipment (vacuum truck)? ☒Yes ☐No

   If No to any question above, then Gross Solids Removal Devices are not feasible. Note that Biofiltration Systems, Infiltration Devices, Detention Devices, Dry Weather Flow Diversion, MCTT, Media Filters, and Wet Basins may be considered for litter capture, but consult with District/Regional NPDES if proposed to meet a TMDL for litter.

5. Does adequate area exist within the right-of-way to place Gross Solids Removal Devices? ☐Yes ☐No
   If Yes, continue to Design Elements section. If No, continue to Question 6.

6. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Gross Solids Removal Devices and how much right-of way would be needed? _____ acres ☐Yes ☐No
   If Yes, continue to the Design Elements section. If No, continue to Question 7.

7. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

Treatment BMPs
Checklist T-1, Part 7

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
PM (KP): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

Traction Sand Traps

Feasibility

1. Can a Detention Device be sized to capture the estimated traction sand and the WQV from the tributary area?
   If Yes, then a separate Traction Sand Trap may not be necessary. Coordinate with the District/Regional Storm Water Coordinator and also complete Checklist T-1, Part 5. ☐Yes ☒No

2. Is the Traction Sand Trap proposed for a site where sand or other traction enhancing substances are applied to the roadway at least twice per year? ☐Yes ☐No

3. Is adequate space provided for Maintenance staff and equipment access for annual cleanout? ☐Yes ☐No

4. Has the local RWQCB agreed that the proposed Traction Sand Trap would not be classified as a regulated underground injection well? ☐Yes ☐No

   If the answer to any one of Questions 2, 3 or 4 is No, then a Traction Sand Trap is not feasible.

5. Does adequate area exist within the right-of-way to place Traction Sand Traps?
   If Yes, continue to Design Elements section. If No, continue to Question 6. ☐Yes ☐No

6. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Traction Sand Traps and how much right-of way would be needed? _____ acres
   If Yes, continue to the Design Elements section. If No, continue to Question 7. ☐Yes ☐No

7. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

Treatment BMPs
Checklist T-1, Part 8

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
PM (KP): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

Media Filters

Caltrans has approved two types of Media Filter: Austin Sand Filters and Delaware Filters. Austin Sand filters are typically designed for larger drainage areas, while Delaware Filters are typically designed for smaller drainage areas. The Austin Sand Filter is constructed with an open top and may have a concrete or earthen invert, while the Delaware is always constructed as a vault. See Appendix B, Media Filters, for a further description of Media Filters.

Feasibility – Austin Sand Filter

1. Is the volume of the Austin Sand Filter equal to at least the WQV using a 40 to 48 hour drawdown? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet]) ☒Yes ☐No

2. Is there sufficient hydraulic head to operate the device (minimum 3 ft between the inflow and outflow chambers)? **Not analyzed in this phase.** ☐Yes ☐No

3. If initial chamber has an earthen bottom, is initial chamber invert ≥ 3 ft above seasonally high groundwater? ☒Yes ☐No

4. If a vault is used for either chamber, is the level of the concrete base of the vault above seasonally high groundwater or is a special design provided? ☒Yes ☐No

   If No to any question above, then an Austin Sand Filter is not feasible.

5. Does adequate area exist within the right-of-way to place an Austin Sand Filter(s)? ☒Yes ☐No
   If Yes, continue to Design Elements sections. If No, continue to Question 6.

6. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of way would be needed to treat WQV? _____ acres ☐Yes ☐No
   If Yes, continue to the Design Elements section.

   If No, continue to Question 7.

7. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐ Complete

Treatment BMPs
Checklist T-1, Part 9

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
PM (KP): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

MCTT (Multi-chambered Treatment Train)

Feasibility

1.	Is the proposed location for the MCTT located to serve a "critical source area" (i.e. vehicle service facility, parking area, paved storage area, or fueling station)?	☐Yes	☐No
2.	Is the WQV ≥ 4,356 ft³ (0.1 acre-foot)?	☐Yes	☐No
3.	Is there sufficient hydraulic head (typically ≥ 6 feet) to operate the device?	☐Yes	☐No
4.	Would a permanent pool of water be allowed by the local vector control agency? If No to any question above, then an MCTT is not feasible.	☐Yes	☒No
5.	Does adequate area exist within the right-of-way to place an MCTT(s)? If Yes, continue to Design Elements sections. If No, continue to Question 6.	☐Yes	☐No
6.	If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of way would be needed to treat WQV? _____ acres If Yes, continue to Design Elements section. If No, continue to Question 7.	☐Yes	☐No
7.	If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project.	☐Complete	

Design Elements

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1.	Is the maximum depth of the 3rd chamber ≤ 13 ft below ground surface and has Maintenance accepted this depth? *	☐Yes	☐No
2.	Is the drawdown time in the 3rd chamber between 24 and 48 hours? *	☐Yes	☐No
3.	Is access for Maintenance vehicles provided to all chambers of the MCTT? *	☐Yes	☐No
4.	Is there sufficient hydraulic head to operate the device? *	☐Yes	☐No
5.	Has a bypass/overflow been provided for storms > WQV? *	☐Yes	☐No
6.	Can pretreatment be provided to capture sediment and litter in the runoff (such as using biofiltration)? **	☐Yes	☐No

Treatment BMPs
Checklist T-1, Part 10

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
PM (KP): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

Wet Basin

Feasibility

1.	Is the volume of the Wet Basin above the permanent pool equal to at least the WQV using a 24 to 72 hour drawdown (40 to 48 hour drawdown preferred)? (Note: the WQV must be ≥ 4,356 ft^3 [0.1 acre-feet] and the permanent pool must be at least 3x the WQV.)	☐ Yes	☒ No
2.	Is a permanent source of water available in sufficient quantities to maintain the permanent pool for the Wet Basin?	☐ Yes	☒ No
3.	Is proposed site in a location where naturally occurring wetlands do not exist?	☒ Yes	☐ No
	Answer either question 4 or question 5:		
4.	For Wet Basins with a proposed invert above the seasonally high groundwater, are NRCS Hydrologic Soil Groups [HSG] C and D at the proposed invert elevation, or can an impermeable liner be used? (Note: If an impermeable liner is used, the seasonally high groundwater elevation must not encroach within 12 inches of the invert.)	☒ Yes	☐ No
5.	For Wet Basins with a proposed invert below the groundwater table: Can written approval from the local Regional Water Quality Control Board be obtained to place the Wet Basin in direct hydraulic connectivity to the groundwater?	☐ Yes	☒ No
6.	Is Water Quality freeboard provided ≥ 1 foot? **Not analyzed in this phase.**	☐ Yes	☐ No
7.	Is the maximum impoundment volume < 14.75 acre-feet? **Not analyzed in this phase.**	☐ Yes	☐ No
8.	Would a permanent pool of water be allowed by the local vector control agency?	☐ Yes	☒ No
	If No to any question above, then a Wet Basin is not feasible.		
9.	Is the maximum basin width ≤ 49 ft as suggested in Section B.10.2?	☐ Yes	☐ No
	If No, consult with the local vector control agency and District Maintenance.		
10.	Does adequate area exist within the right-of-way to place a Wet Basin? If Yes, continue to Design Elements sections.	☐ Yes	☐ No
	If No, continue to Question 10.		

Attachment J

Checklist CS-1, Parts 1-6

Construction Site BMPs
Checklist CS-1, Part 1

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
PM (KP): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

Soil Stabilization

General Parameters

1. How many rainy seasons are anticipated between beginning and end of construction? — 4

2. What is the total disturbed soil area for the project? (ac) — 28.7

   (a) How much of the project DSA consists of slopes 1V:4H or flatter? (ac) —

   (b) How much of the project DSA consists of 1V:4H < slopes < 1V:2H? (ac) — N/A

   (c) How much of the project DSA consists of slopes 1V:2H and steeper? (ac) — N/A

   (d) How much of the project DSA consists of slopes with slope lengths longer then 20 ft? (ac) —

3. What rainfall area does the project lie within? (Refer to Table 2-1 of the Construction Site Best Management Practices Manual) — 4

4. Review the required combination of temporary soil stabilization and temporary sediment controls and barriers for area, slope inclinations, rainy and non-rainy season, and active and non-active disturbed soil areas. (Refer to Tables 2-2, and 2-3 of the Construction Site Best Management Practices Manual for Rainfall Area requirements.) — ☒ Complete

Scheduling (SS-1)

5. Does the project have a duration of more then one rainy season and have disturbed soil area in excess of 25 acres? — ☒ Yes ☐ No

   (a) Include multiple mobilizations (Move-in/Move-out) as a separate contract bid line item to implement permanent erosion control or revegetation work on slopes that are substantially complete. (Estimate at least 6 mobilizations for each additional rainy season. Designated Construction Representative may suggest an alternate number of mobilizations.) **Will comply in PS&E phase.** — ☐ Complete

Construction Site BMPs
Checklist CS-1, Part 2

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
PM (KP): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

Sediment Control

Perimeter Controls - Run-off Control

1. Is there a potential for sediment laden sheet and concentrated flows to discharge offsite from runoff cleared and grubbed areas, below cut slopes, embankment slopes, etc.? ☒Yes ☐No

   (a) Select linear sediment barrier such as SC-1 (Silt Fence), SC-5 (Fiber Rolls), SC-6 (Gravel Bag Berm), SC-8 (Sand Bag Barrier), SC-9 (Straw Bale Barrier), or a combination to protect wetlands, water courses, roads (paved and unpaved), construction activities, and adjacent properties. (Coordinate with District Construction for selection and preference of linear sediment barrier BMPs.) **Will comply in PS&E phase.** ☐ Complete

   (b) Increase the quantities by 25% for each additional rainy season. (Designated Construction Representative may suggest an alternate increase.) ☒ Complete

   (c) Designate as a separate contract bid line item. ☒ Complete

   Will comply in PS&E phase.

Perimeter Controls - Run-on Control

2. Do locations exist where sheet flow upslope of the project site and where concentrated flow upstream of the project site may contact DSA and construction activities? ☐Yes ☒No

   (a) Utilize linear sediment barriers such as SS-9 (Earth Dike/Drainage Swales and Lined Ditches), SC-5 (Fiber Rolls), SC-6 (Gravel Bag Berm), SC-8 (Sand Bag Barrier), SC-9 (Straw Bale Barrier), or other BMPs to convey flows through and/or around the project site. (Coordinate with District Construction for selection and preference of perimeter control BMPs.) ☐ Complete

Construction Site BMPs
Checklist CS-1, Part 3

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
PM (KP): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

Tracking Controls

Stabilized Construction Entrance/Exit (TC-1)

1. Are there points of entrance and exit from the project site to paved roads where mud and dirt could be transported offsite by construction equipment? (Coordinate with District Construction for selection and preference of tracking control BMPs.) ☒Yes ☐No

   (a) Identify and designate these entrance/exit points as stabilized construction entrances (TC-1). **Will comply in PS&E phase.** ☐ Complete

   (b) Designate as a separate contract bid line item. **Will comply in PS&E phase.** ☐ Complete

Tire/Wheel Wash (TC-3)

1. Are site conditions anticipated that would require additional or modified tracking controls such as entrance/outlet tire wash? (Coordinate with District Construction.) ☐Yes ☒No

   Designate as a separate contract bid line item. ☐ Complete

Stabilized Construction Roadway (TC-2)

3. Are temporary access roads necessary to access remote construction activity locations or to transport materials and equipment? (In addition to controlling dust and sediment tracking, access roads limit impact to sensitive areas by limiting ingress, and provide enhanced bearing capacity.) (Coordinate with District Construction.) ☐Yes ☒No

   (a) Designate these temporary access roads as stabilized construction roadways (TC-2). ☐ Complete

   (b) Designate as a separate contract bid line item. ☐ Complete

Street Sweeping and Vacuuming (SC-7)

1. Is there a potential for tracked sediment or construction related residues to be transported offsite and deposited on public or private roads? (Coordinate with District Construction for preference of including street sweeping and vacuuming with tracking control BMPs.) **Will comply in PS&E phase.** ☐Yes ☐No

Construction Site BMPs
Checklist CS-1, Part 4

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
PM (KP): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

Wind Erosion Controls

Wind Erosion Control (WE-1)

1. Is the project located in an area where standard dust control practices in accordance with Standard Specifications, Section 10: Dust Control, are anticipated to be inadequate during construction to prevent the transport of dust offsite by wind? *(Note: Dust control by water truck application is paid for through the various items of work. Dust palliative, if it is included, is paid for as a separate item.)* ☒ Yes ☐ No

   (a) Select SS-3 (Hydraulic Mulch), SS-4 (Hydroseeding), SS-5 (Soil Binders), SS-7 (Geotextiles, Plastic Covers, & Erosion Control Blankets/Mats), SS-8 (Wood Mulching) or a combination to cover the DSA subject to wind erosion year-round, especially when significant wind and dry conditions are anticipated during project construction. (Coordinate with District Construction for selection and preference of wind erosion control BMPs.) **Will comply in PS&E phase.** ☐ Complete

   (b) Designate as a separate contract bid line item. ☐ Complete

   Will comply in PS&E phase.

Construction Site BMPs
Checklist CS-1, Part 5

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
PM (KP): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

Non-Storm Water Management

Temporary Stream Crossing (NS-4) & Clear Water Diversion (NS-5)

1. Will construction activities occur within a waterbody or watercourse such as a lake, wetland, or stream? (Coordinate with District Construction for selection and preference for stream crossing and clear water diversion BMPs.) ☐Yes ☒No

   (a) Select from types offered in NS-4 (Temporary Stream Crossing) to provide access through watercourses consistent with permits and agreements.[1] ☐ Complete

   (b) Select from types offered in NS-5 (Clear Water Diversion) to divert watercourse consistent with permits and agreements.[1] ☐ Complete

   (c) Designate as a separate contract bid line item(s). ☐ Complete

Other Non-Storm Water Management BMPs

2. Are construction activities anticipated that will generate wastes or residues with the potential to discharge pollutants? ☒Yes ☐No

   (a) Identify potential pollutants associated with the anticipated construction activity and select the corresponding BMP such as NS-1 (Water Conservation Practices), NS-2 (Dewatering Operations), NS-3 (Paving and Grinding Operations), NS-7 (Potable Water/Irrigation), NS-8 (Vehicle and Equipment Cleaning), NS-9 (Vehicle and Equipment Fueling), NS-10 (Vehicle and Equipment Maintenance), NS-11 (Pile Driving Operations), NS-12 (Concrete Curing), NS-13 (Material and Equipment Use Over Water), NS-14 (Concrete Finishing), and NS-15 (Structure Demolition/Removal Over or Adjacent to Water).[1] ☒ Complete

   (b) Verify that costs for non-storm water management BMPs are identified in the contract documents. Designate BMP as a separate contract bid line item if the requirements in Construction Site Management (SSP 07-346) are anticipated to be inadequate or if requested by Construction. ☒ Complete

Construction Site BMPs
Checklist CS-1, Part 6

Prepared by: B. Balderrama Date: 5-19-2010 District-Co-Route: 08-SBd-10
PM (KP): 4.1/6.1 EA: 0J400K
RWQCB: Santa Ana

Waste Management & Materials Pollution Control

Concrete Waste Management (WM-8)

1. Does the project include concrete pours or mortar mixing? ☒Yes ☐No

   (a) Select from types offered in WM-8 (Concrete Waste Management) to provide concrete washout facilities. In addition, consider portable concrete washouts and vendor supplied concrete waste management services. (Coordinate with District Construction for selection and preference of waste management and materials pollution control BMPs.) **Will comply in PS&E phase.** ☐ Complete

   (b) Designate as a separate contract bid line item if the quantity of concrete waste and washout are anticipated to exceed 5.2 yd^3 or if requested by Construction. **Will comply in PS&E phase.** ☐ Complete

Other Waste Management and Materials Pollution Controls

2. Are construction activities anticipated that will generate wastes or residues with the potential to discharge pollutants? ☒Yes ☐No

   (a) Identify potential pollutants associated with the anticipated construction activity and select the corresponding BMP such as WM-1 (Material Delivery and Storage), WM-2 (Material Use), WM-4 (Spill Prevention and Control), WM-5 (Solid Waste Management), WM-6 (Hazardous Waste Management), WM-7 (Contaminated Soil Management), WM-9 (Sanitary/Septic Waste Management) and WM-10 (Liquid Waste Management) **Will comply in PS&E phase.** ☐ Complete

   (b) Verify that costs for waste management and materials pollution control BMPs are identified in the contract documents. Designate BMP as a separate contract bid line item if the requirements in Construction Site Management (SSP 07-346) are anticipated to be inadequate or if requested by Construction. **Will comply in PS&E phase.** ☐ Complete

Temporary Stockpiles (Soil, Materials, and Wastes)

3. Are stockpiles of soil, etc. anticipated during construction? ☒Yes ☐No

Attachment K

Flow and Volume Based BMP Design Calculations

AECOM
1131 West 6th Street
Ontario, CA 91762
T 909.933.5225 F 909.933.5228

Job 17100.00
Sheet No. 1 of 1
Calculated by: RRN Date 4/22/09
Checked by: Date
Scale

California BMP - Treatement Control - "Flow Based" BMP Design

1 BMP Drainage Area (Eastern portion) **A= 28.70 acres**

2-yr 1-Hr. Rainfall 0.6
Regression Coef.= 0.2787
BMP Design Rainfall Intensity, I_{BMP} = 0.334
Impervious Ratio= 0.35

2 Rainfall to Runoff Losses

Cover Descr.	Area	Ap (%)	C BMP	Cw
Condominium	28.70	65%	0.252	7.236
Σ=	28.70		ΣCw=	0.252

C_{BMP}= 0.25

3 Target BMP Flow Rate, Q

Q= $C_{BMP} \times I_{BMP} \times A$ = 2.42 c.f.s.

4 Flow Rate per Acre

0.08 c.f.s./ac.

AECOM
1131 West 6th Street
Ontario, CA 91762
T 909.933.5225 F 909.933.5228

Job	17100.00		
Sheet No.	1	of	1
Calculated by:	RRN	Date	4/22/09
Checked by:		Date	
		Scale	

California BMP - Treatement Control - "Volume Based" BMP Design

1 BMP Drainage Area A= 28.70 acres

2-yr 1-Hr. Rainfall		0.6
Regression Coef. For P6=	1.4807	
6-Hr. Mean Storm Rainfall, P6=		0.888
Impervious Ratio=	0.35	
Drawdown Regression Constant,a=		1.963

2 Rainfall to Runoff Losses

Cover Descr.	Area	Ap (%)	C BMP	Cw
Commercial	28.70	65%	0.252	7.236
Σ=	28.70		ΣCw=	0.252

CBMP= 0.25

3 Maximum Detention Volume, Po

Po = a x CBMP x P6 = 0.44 in.

4 Target Capture Volume, Vo

Vo = (Po x A) / 12 = 1.05 ac.-ft.
= 45,810.32 cf

Attachment L

Storm Water BMP Cost Summary

Table F-3
Appendix F
PPDG

Description	Recommended Adjustment	Adjustment Used
Baseline Cost Percentage	1.25	1.25
Adjustment for Project Magnitude (Cost)		
$0 to $1,000,000	2.00	
$1,000,000 to $1,500,000	1.25	
$1,500,000 to $12,000,000	0.25	
Greater than $12,000,000	0.00	0.00
Adjustment for Location (RWQCB)		
Region 9 (San Diego)	0.75	
All other Regions	0.00	0.00
Adjustment for Type of Project		
Highway Planting	0.10	0.10
All Other Projects	0.00	
Adjustment for Work Near 303(d) Water Bodies		
Work near 303(d) Water Bodies	Project Specific	0.00
Adjustment for Project Specific Issues		
4 Rainy Seasons During 4 year Construction Period	Project Specific	0.25
Existing Highly Urbanized Area	Project Specific	0.25
Total Adjustments for Water Pollution Control		**1.85**