EXHIBIT 2-A

Quality Manual Template

This exhibit is posted as a standalone file.

EXHIBIT 2-B

List of Studies and Report for Design Development

EXHIBIT 2-B

List of Studies and Report for Design Development				
DOCUMENT NAME	**[1] NO. OF COPIES**	**REVIEW TIME (WORKING DAYS)**	**Acceptance/ Approval Needed by**	**[2] Instructions**
SWDR - Phase	9 + 1 bound	15	Acceptance needed prior to release for construction.	Must be signed in accordance with Chapter 2, Section 9 of the PDPM and as required within the RFP. Submittal of this report shall include a copy of the most current Drainage Report-Phase for the same location and/or phase, Roadway Plans, Drainage Plans, Grading Plans, Retaining Wall Plan, Utility Plan, Material Report, and Geotechnical Report. Additional reviews will be conducted as necessary to obtain acceptance of the SWDR by the Department. All previous comments must be addressed and included on the latest submittal. Design Builder shall provide a pdf copy of the accepted report to the Department. The Department shall be given the original accepted document.
SWDR - Final (Comprehensive)	9 + 1 bound	20	Approval needed prior to release for construction of the last location and/or phase.	The SWDR-Final must be consistent with the other SWDR-Phase reports and will supersede all previous SWDRs. Must be signed in accordance with Chapter 2, Section 9 of the PDPM and as required within the RFP. Submittal of this report shall include a copy of the most current Drainage Report-Final for the same location and/or phase, Roadway Plans, Drainage Plans, Grading Plans, Retaining Wall Plans, Utility Plans, Material Report, and Geotechnical Report. Additional reviews will be conducted as necessary to obtain approval of the SWDR. Design Builder shall provide a pdf copy of the approved report to the Department. The Department shall be given the original approved document.
Drainage Report - Phase	2 bound	15	Acceptance needed prior release for construction.	Must be signed in accordance with Chapter 2, Section 9 of the PDPM and as required within the RFP. Additional reviews will be conducted as necessary to obtain acceptance of the drainage report. All previous comments must be addressed and included on the latest submittal. Design Builder shall provide a pdf copy of the accepted report to the Department. The Department shall be given the original accepted document. Note: The Drainage Report must be resubmitted for review and acceptance if any field changes to the accepted drainage design for each location occurs.
Drainage Report - Final (Comprehensive)	2 bound	20	Approval needed prior to release for construction of the last location and/or phase.	The Drainage Report-Final must be consistent with the other Drainage Reports-phase reports and will supersede all previous drainage reports. Must be signed in accordance with Chapter 2, Section 9 of the PDPM and as required within the RFP. Additional reviews will be conducted as necessary to obtain approval of the drainage report. All previous comments must be addressed and included on the latest submittal. Design Builder shall provide a pdf copy of the approved report to the Department. The Department shall be given the original approved document.

DOCUMENT NAME	[1] NO. OF COPIES	REVIEW TIME (WORKING DAYS)	Acceptance/ Approval Needed by	[2] Instructions
Materials Report	3 (bound)	30	Approval needed prior to the commencement of pavement operations of any State facility	Must be signed in accordance with Chapter 2, Section 9 of the PDPM and as required within the RFP. Must be signed and sealed by the Design Builder's R.C.E. Additional reviews will be conducted as necessary to obtain approval of the Materials Report. All previous comments must be addressed and included with the latest submittal. Design Builder shall provide a pdf copy of the approved report to the Department. The Department shall be given the original approved document. Any pavement work on non-State facilities must be coordinated between the Design Builder and the appropriate agency.
Geotechnical Report	3 bound	15	See Book 2, Section 8.	No more than two reports submitted for review per week. Must be signed in accordance with the PDPM Chapter 2, Section 9 and as required within the RFP. Additional reviews will be conducted as necessary to obtain approval of the report. All previous comments must be addressed and included with the latest submittal. Design Builder shall provide a pdf copy of the approved report to the Department. The Department shall be given the original approved document.
LCCA (If Applicable)	2 bound	30	Approval needed pior to the approval of the Materials Report	Must be signed in accordance with Chapter 2, Section 9 of the PDPM and as required within the RFP. Must be consistent with the approved Materials Report recommendations. Additional reviews will be conducted as necessary to obtain approval of the LCCA. All previous comments must be addressed and included with the latest submittal. Design Builder shall provide a pdf copy of the approved report to the Department. The Department shall be given the original approved document.
Structure Hydraulics Report	2	15	See Book 2, Section 13	
Bridge Load Rating Report	2	15	See Book 2, Section 13	
Seismic Assessment Report	3	15	See Book 2, Section 13	
TMP - Prior to NTP2	2	40	Approval needed before issuance of NTP2	Design Builder shall provide a pdf copy of the approved TMP to the Department.
TMP - After NTP2	2	10	On-going	The TMP will need to be revised continuously throughout the life of the project after issuance of NTP2 and approved by the Department. Additional reviews will be conducted as necessary to obtain approval of the TMP. All subsequent revisions must be approved by the Department before implementation. Design Builder shall provide a pdf copy of the approved TMP to the Department.

DOCUMENT NAME	[1] NO. OF COPIES	REVIEW TIME (WORKING DAYS)	Acceptance/ Approval Needed by	[2] Instructions
Storm Water Quality Master Plan	5	20	Acceptance needed before issuance of NTP2	Must be signed in accordance with Chapter 2, Section 9 of the PDPM and as required within the RFP. Additional reviews will be conducted as necessary to obtain acceptance of the Storm Water Quality Master Plan by the Department. All previous comments must be addressed and included on the latest submittal. Design Builder shall provide a pdf copy of the accepted report to the Department. The Department shall be given the original accepted document.

1. An electronic copy (pdf format) must be provided with all submittals. PDF format must allow searchable by texts.
2. Additional requirements and instructions can be found within the RFP

Note:
This list is not to be considered all inclusive of the reports required from the Design Builder. Additional reports may be required as indicated throughout this RFP, HDM, Ramp Metering Manual, and PDPM-Chapter 2 Section 9.

EXHIBIT 2-C

List of Required Plans for Design Development

EXHIBIT 2-C

List of Required Plans for Design Development			
[1.] TYPE OF PLANS	[2.] NO. OF COPIES	[3] 60% ELEMENTS	[3] 100% ELEMENTS
ROADWAY PLANS	5	SUPERELEVATION DIAGRAMS	60% COMMENTS WITH RESPONSES
		STAGE CONSTRUCTION	ALL ELEMENTS FROM 60%
		DRAINAGE PLANS	FINAL RETAINING WALL PLANS
		CONSTRUCTION DETAILS	PROPOSED R/W
		TYPICAL X-SECTIONS	ACCURATE GRID GRADES
		SSP'S	DETOUR PLANS
		RETAINING WALL LOCATIONS	CONSTRUCTION STORM WATER DETAIL PLANS
		ROADWAY LAYOUTS	CONTOUR GRADING PLANS
		TITLESHEET	Estimated construction cost of proposed work
		KEYMAP	
		CONSTRUCTION STORM WATER DETAIL PLANS	
		CONTOUR GRADING PLANS	
		Schedule for proposed work	
		PROFILES	
DRAINAGE PLANS	5	Preliminary Drainage Report (Including Hydrology maps and all Hydraulic calculations)	All Elements from 60%
		Vertical and Horizontal Alignments	Response & Corrections to all previous comments
		Conceptual approval of non-standard SSPs	Final Drainage Report
		Typical Cross Sections	All required permits obtained
		Utilities impacted by proposed drainage systems must be identified.	Revised Floodplain Evaluation Report Summary (If changes to scope of work after PA&ED phase)
		Drainage for Construction Staging	All cooperative agreements executed.
		Drainage interface/coordination with adjoining projects and/or consideration for future projects	Final Approval of Drainage Specifications (Standard and SSP)
		Drainage Layout, Profiles, Details, and any Special designs (Large U/G Structures, Pump Stations, Etc.)	
		Grading Plans, Contour Maps, etc.	Drainage Quantity sheets must be complete, accurate, and verified.
		Adequate consideration of Subsurface Conditions (groundwater control)	Revised Location Hydraulic Study (If changes to scope of work after PA&ED phase)
		Flow Diversion/Connection Approved by Appropriate Agencies	Construction Storm Water Detail Plans
		Utilization of correct erosion factors for slope soil loss, stream aggradation/degradation outlet velocities	Estimated construction cost of proposed work
		Drainage Quantity sheets	
		PS&E level Location Hydraulic Study and Floodplain Analysis	
		Adequate Soundwall and/or Retaining Wall Drainage	
		Construction Storm Water Detail Plans	
		Adequate Backfills based on Material Report's Recommendations and Data	
		Schedule for proposed work	
UTILITY PLANS	5	TITLESHEET	60% COMMENTS WITH RESPONSES
		KEYMAP	ALL ELEMENTS FROM 60%
		ROADWAY LAYOUTS	Estimated construction cost of proposed work
		UTILITY LAYOUTS (EXIST/PROPOSED)	
		UTILITY DETAILS	
		PARTIAL CROSS SECTIONS	
		DRAINAGE PLANS	
		SSP'S	
		Schedule for proposed work	

[1.] TYPE OF PLANS	[2.] NO. OF COPIES	[3] 60% ELEMENTS	[3] 100% ELEMENTS
STAGE CONSTRUCTION AND TRAFFIC HANDLING PLANS	5	ROADWAY LAYOUTS	60% COMMENTS WITH RESPONSES
		STAGE CONSTRUCTION PLANS	ALL ELEMENTS FROM 60%
		TRAFFIC HANDLING PLANS	FINAL STAGING QUANTITIES
		TYPICAL CROSS SECTIONS	
		DETOUR PLANS	
		Schedule for proposed work	
		SSP's	
PAVEMENT DELINEATION AND SIGN PLANS	5	PAVEMENT DELINEATION LAYOUTS	60% COMMENTS WITH RESPONSES
		SIGN PLANS/TABLES	ALL ELEMENTS FROM 60%
		OVERHEAD SIGN STRUCTURE DETAILS	FINAL QUANTITIES
		SSP'S	Estimated construction cost of proposed work
		Schedule for proposed work	
Structural Plans	5	See Book 2, section 13	See Book 2, section 13
LANDSCAPE PLANS	5	GRADING PLANS	60% COMMENTS WITH RESPONSES
		EROSION CONTROL PLANS	ALL ELEMENTS FROM 60%
		LANDSCAPE LAYOUTS	CONSTRUCTION STORM WATER DETAIL PLANS
		CONSTRUCTION STORM WATER DETAIL PLANS	Estimated construction cost of proposed work
		CONTOUR GRADING PLANS	
		TITLESHEET	
		KEYMAP	
		SSP'S	
		Schedule for proposed work	
CONTOUR GRADING PLANS	5	CONTOUR GRADING LAYOUTS	60% COMMENTS WITH RESPONSES
		ROADWAY PLANS	ALL ELEMENTS FROM 60%
		SIGN PLANS	
		DRAINAGE PLANS	
		Schedule for proposed work	
ELECTRICAL PLANS	5	ROADWAY LAYOUTS	60% COMMENTS WITH RESPONSES
		STAGE CONSTRUCTION AND TRAFFIC HANDLING PLANS	ALL ELEMENTS FROM 60%
		PAVEMENT DELINEATION AND SIGN PLANS	Estimated construction cost of proposed work
		UTILITY PLANS	
		LANDSCAPE PLANS	
		STRUCTURES PLANS	
		ELECTRICAL LAYOUTS	
		SSP'S	
		Schedule for proposed work	

[1.] Microstation files of submittals shall be made accessible to the Department.

[2.] Additional copies shall be provided at the request of the Department

[3.] The elements listed are not all inclusive. Additional information may be requested by the Department in order complete its review.

Note:
This list is not all inclusive of plans requiring Department review. The Department reserves the right to request any additional plans from the Design Builder in order to approve release for constructin documents.

EXHIBIT 2-D

Source Inspection Material Control Process

Exhibit 2-D
Source Inspection Material Control Process
Quality Assurance Inspection Process

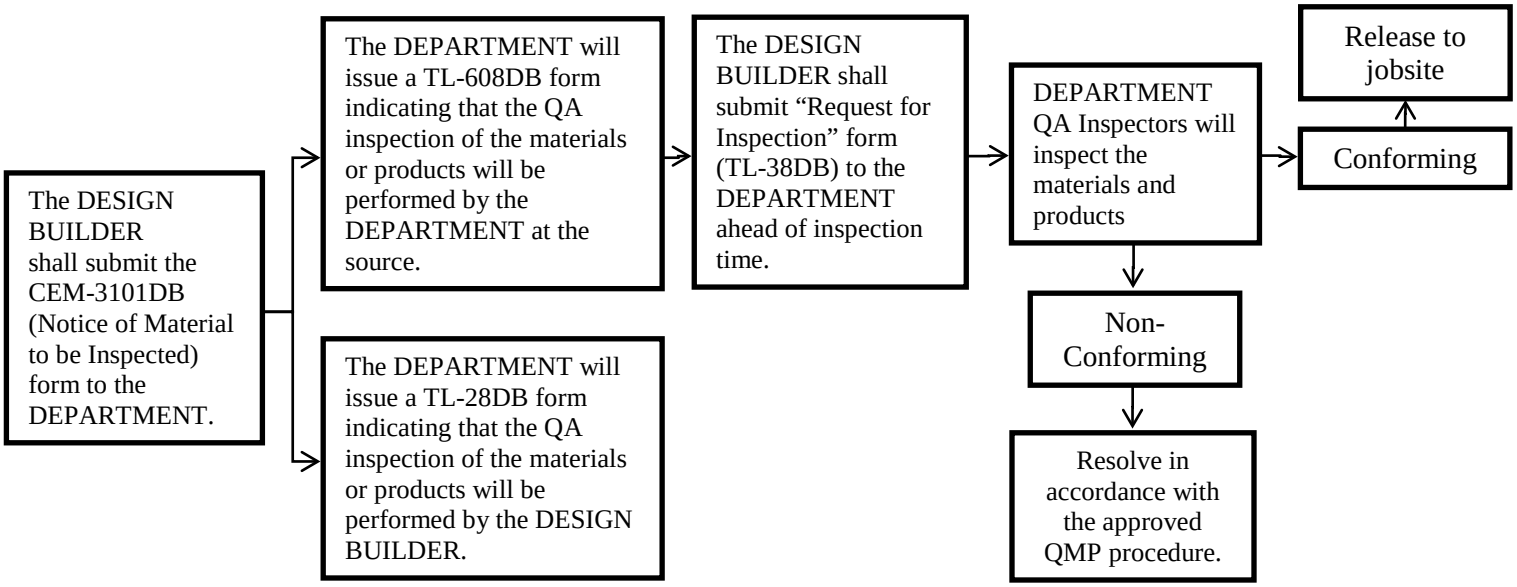

EXHIBIT 2-E

Source Inspection Tier Priority List

Tier-Failures
1: Catastrophic consequence - Must inspect
2: Significant safety concerns - May inspect
3: linterruptioin in service - Periodically inspect
4: Loss of funds to repair item - Periodically inspect

Inspection Priority
A: Highest - source inspection by METS
B: Lowest - source inspection by METS
E: Electrical Branch inspects

Responsible OSM Committee
CC: Concrete
MT: Materials Testing
SI: Source Inspection
WS: Welding

Using AutoFilter Drop Down List
Autofilter On
Menu: DATA /FILTER/ AUTOFILTER
Autofilter Offn
Menu: DATA /FILTER/ AUTOFILTER

* State Furnished and Standard Bid Items Only

Tier	Inspection Priority	Bid Item*	Resp OSM Comm	Description	Category
1	A	VARIES	CC	FURNISH PRECAST CONCRETE GIRDER	STRUCTURAL PRECAST CONCRETE
1	A	VARIES	CC	FURNISH PRECAST PRESTRESSED CONCRETE DECK UNIT (SLAB TYPE)	STRUCTURAL PRECAST CONCRETE
1	A	VARIES	CC	FURNISH PRECAST PRESTRESSED CONCRETE GIRDER	STRUCTURAL PRECAST CONCRETE
1	A	VARIES	CC	FURNISH PRECAST PRESTRESSED CONCRETE SLAB	STRUCTURAL PRECAST CONCRETE
1	A	550201	WS	FURNISH STRUCTURAL STEEL	STRUCTURAL STEEL
1	A	550203	WS	FURNISH STRUCTURAL STEEL (BRIDGE)	STRUCTURAL STEEL
1	A	550101	WS	STRUCTURAL STEEL	STRUCTURAL STEEL
1	A	550102	WS	STRUCTURAL STEEL (BRIDGE)	STRUCTURAL STEEL
2	A	550120	WS	ALTERNATIVE COLUMN CASING	COLUMN CASING
2	A	VARIES	MT	BAR REINFORCING STEEL	BAR REINFORCING STEEL
2	A	704700	WS	CEMENT-MORTAR LINED AND REINFORCED CEMENT-MORTAR COATED WELDED STEEL PRESSURE PIPE	WELDED STEEL PIPE
2	A	VARIES	WS	CEMENT-MORTAR LINED AND REINFORCED CEMENT-MORTAR COATED WELDED STEEL PRESSURE PIPE (CLASS 100)	WELDED STEEL PIPE
2	A	VARIES	WS	CEMENT-MORTAR LINED AND REINFORCED CEMENT-MORTAR COATED WELDED STEEL PRESSURE PIPE (CLASS 200)	WELDED STEEL PIPE
2	A	VARIES	WS	CEMENT-MORTAR LINED, ASPHALT COATED AND WRAPPED WELDED STEEL PIPE	WELDED STEEL PIPE
2	A	VARIES	WS	COATED AND WRAPPED WELDED STEEL PIPE	WELDED STEEL PIPE
2	A	550110	WS	COLUMN CASING	COLUMN CASING
2	A	VARIES	WS	FURNISH PILING (CLASS ___) (ALTERNATIVE V)	PILE (CLASS 70 TO 900)
2	A	VARIES	WS	FURNISH PILING (CLASS ___) (ALTERNATIVE W)	PILE (CLASS 70 TO 900)
2	A	VARIES	CC	FURNISH PILING (CLASS___)	PILE (CLASS 70 TO 900)
2	A	560230	WS	FURNISH SIGN STRUCTURE (BOX BEAM-CLOSED TRUSS)	SIGN STRUCTURE
2	A	560203	WS	FURNISH SIGN STRUCTURE (BRIDGE MOUNTED WITH WALKWAY)	SIGN STRUCTURE
2	A	560223	WS	FURNISH SIGN STRUCTURE (BRIDGE MOUNTED WITHOUT WALKWAY)	SIGN STRUCTURE
2	A	560213	WS	FURNISH SIGN STRUCTURE (LIGHTWEIGHT)	SIGN STRUCTURE
2	A	560218	WS	FURNISH SIGN STRUCTURE (TRUSS)	SIGN STRUCTURE
2	A	560208	WS	FURNISH SIGN STRUCTURE (TUBULAR)	SIGN STRUCTURE
2	A	VARIES	WS	FURNISH STEEL PILING	STEEL PILE
2	A	VARIES	WS	FURNISH STEEL PIPE PILING	STEEL PIPE PILE
2	A	490553	WS	FURNISH STEEL SHEET PILING	STEEL SHEET PILE
2	A	490101	SI	FURNISH TIMBER PILING	TIMBER PILE
2	A	490201	SI	FURNISH TREATED TIMBER PILING	TIMBER PILE
2	A	VARIES	MT	HEADED BAR REINFORCEMENT	BAR REINFORCING STEEL
2	A	VARIES	WS	JACKED WELDED STEEL PIPE	WELDED STEEL PIPE
2	A	562002	WS	METAL (BARRIER MOUNTED SIGN)	SIGN STRUCTURE
2	A	562004	WS	METAL (RAIL MOUNTED SIGN)	SIGN STRUCTURE
2	A	562001	WS	METAL (ROADSIDE SIGN)	SIGN STRUCTURE
2	A	VARIES	WS	METAL LINER PLATE PIPE	STEEL PLATE PIPE
2	A	VARIES	WS	METAL LINER PLATE PIPE (TYPE A)	STEEL PLATE PIPE
2	A	500010	MT	PRESTRESSING	CAST-IN-PLACE PRESTRESSED CONCRETE
2	A	518050	WS	PTFE BEARING	BEARING PAD (PTFE BEARING)
2	A	518051	WS	PTFE SPHERICAL BEARING	BEARING PAD (PTFE BEARING)
2	A	490380	WS	SHEET PILING	STEEL SHEET PILE
2	A	560113	WS	SIGN STRUCTURE (BRIDGE MOUNTED WITH WALKWAY)	SIGN STRUCTURE
2	A	560120	WS	SIGN STRUCTURE (BRIDGE MOUNTED WITHOUT WALKWAY)	SIGN STRUCTURE
2	A	490801	WS	STEEL SHEET PILING	STEEL SHEET PILE
2	A	VARIES	WS	STRUCTURAL STEEL PLATE ARCH	STEEL PLATE PIPE
2	A	VARIES	WS	STRUCTURAL STEEL PLATE PIPE	STEEL PLATE PIPE
2	A	VARIES	WS	STRUCTURAL STEEL PLATE PIPE (1/4 LINED)	STEEL PLATE PIPE
2	A	VARIES	WS	STRUCTURAL STEEL PLATE PIPE (4 BOLT)	STEEL PLATE PIPE
2	A	VARIES	WS	STRUCTURAL STEEL PLATE PIPE (6 BOLT)	STEEL PLATE PIPE
2	A	VARIES	WS	STRUCTURAL STEEL PLATE PIPE (8 BOLT)	STEEL PLATE PIPE
2	A	VARIES	WS	STRUCTURAL STEEL PLATE PIPE ARCH	STEEL PLATE PIPE
2	A	VARIES	WS	STRUCTURAL STEEL PLATE UNDERPASS	STEEL PLATE PIPE
2	A	VARIES	WS	STRUCTURAL STEEL PLATE VEHICULAR UNDERPASS	STEEL PLATE PIPE
2	A	VARIES	WS	WELDED STEEL PIPE	WELDED STEEL PIPE

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Using AutoFilter Drop Down List
Autofilter On
Menu: DATA /FILTER/ AUTOFILTER
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* State Furnished and Standard Bid Items Only

Tier	Inspection Priority	Bid Item*	Resp OSM Comm	Description	Category
2	A	VARIES	WS	WELDED STEEL PIPE CASING (BRIDGE)	WELDED STEEL PIPE
2	A	VARIES	WS	WELDED STEEL PIPE CONDUIT	WELDED STEEL PIPE
2	A	VARIES	WS	WELDED STEEL PIPE-LINER	WELDED STEEL PIPE
3	A	709904	SI	CATCH BASIN	DRAINAGE COMPONENT (GRATE)
3	A	719530	SI	CURB DRAIN	DRAINAGE COMPONENT (GRATE)
3	A	VARIES	SI	DEBRIS DEFLECTOR	DRAINAGE COMPONENT (GRATE)
3	A	706551	SI	DEBRIS DEFLECTOR RAIL	DRAINAGE COMPONENT (GRATE)
3	A	VARIES	SI	DEBRIS RACK	DRAINAGE COMPONENT (GRATE)
3	A	VARIES	SI	DEBRIS RACK	DRAINAGE COMPONENT (GRATE)
3	A	VARIES	SI	DEBRIS RACK CAGE	DRAINAGE COMPONENT (GRATE)
3	A	706540	SI	DEBRIS RISER	DRAINAGE COMPONENT (GRATE)
3	A	709901	SI	DEFORMED METAL PIPE	DRAINAGE COMPONENT (GRATE)
3	A	707050	SI	DRAINAGE INLET	DRAINAGE COMPONENT (GRATE)
3	A	707051	SI	DRAINAGE MANHOLE	DRAINAGE COMPONENT (GRATE)
3	A	750008	SI	FRAME AND COVER	MISCELLANEOUS METAL
3	A	750007	SI	FRAME AND GRATE	MISCELLANEOUS METAL
3	A	750015	SI	FRAME AND GRATE (SPECIAL)	MISCELLANEOUS METAL
3	A	719531	SI	GUTTER DRAIN	DRAINAGE COMPONENT (GRATE)
3	A	709906	SI	INLET	DRAINAGE COMPONENT (GRATE)
3	A	709903	SI	INLET (SPECIAL)	DRAINAGE COMPONENT (GRATE)
3	A	750025	SI	INLET FRAME AND COVER	MISCELLANEOUS METAL
3	A	750030	SI	INLET FRAME AND GRATE	MISCELLANEOUS METAL
3	A	750035	SI	INLET FRAME AND GRATE (TYPE 36R)	MISCELLANEOUS METAL
3	A	750050	SI	INLET GRATE	MISCELLANEOUS METAL
3	A	750049	SI	INLET GRATE (TYPE 36R)	MISCELLANEOUS METAL
3	A	VARIES	SI	MANHOLE	DRAINAGE COMPONENT (MANHOLE)
3	A	750010	SI	MANHOLE FRAME AND COVER	DRAINAGE COMPONENT (MANHOLE)
3	A	750013	SI	MANHOLE FRAME AND COVER (PRESSURE)	DRAINAGE COMPONENT (MANHOLE)
3	A	750011	SI	MANHOLE FRAME AND GRATE	DRAINAGE COMPONENT (MANHOLE)
3	A	709907	SI	MEDIAN INLET	DRAINAGE COMPONENT (GRATE)
3	A	VARIES	MT	METAL BEAM GUARD RAILING	RAILING (METAL BEAM GUARD RAILING)
3	A	VARIES	SI	METAL CATTLE GUARD	DRAINAGE COMPONENT (GRATE)
3	A	750001	WS	MISCELLANEOUS IRON AND STEEL	MISCELLANEOUS METAL
3	A	750002	WS	MISCELLANEOUS IRON AND STEEL (SEWER SYSTEM)	MISCELLANEOUS METAL
3	A	750500	WS	MISCELLANEOUS METAL	MISCELLANEOUS METAL
3	A	750501	WS	MISCELLANEOUS METAL (BRIDGE)	MISCELLANEOUS METAL
3	A	750510	WS	MISCELLANEOUS METAL (BRIDGE) (APPROACH)	MISCELLANEOUS METAL
3	A	750511	WS	MISCELLANEOUS METAL (BRIDGE) (CHANNEL)	MISCELLANEOUS METAL
3	A	750502	WS	MISCELLANEOUS METAL (RETAINING WALL)	MISCELLANEOUS METAL
3	A	VARIES	SI	PIPE ENERGY DISSIPATOR	DRAINAGE COMPONENT (GRATE)
3	A	VARIES	MT	PIPE HANDRAILING	RAILING (PIPE HANDRAILING)
3	A	706550	SI	RAIL DEBRIS DEFLECTOR MEMBER	DRAINAGE COMPONENT (GRATE)
3	A	709905	SI	RUBBLE ENERGY DISSIPATOR	DRAINAGE COMPONENT (GRATE)
3	A	VARIES	SI	SEWER MANHOLE	DRAINAGE COMPONENT (MANHOLE)
3	A	719190	SI	SEWER MANHOLE FRAME AND COVER	DRAINAGE COMPONENT (MANHOLE)
3	A	197060	MT	SOIL NAIL ASSEMBLY	SOIL NAIL ASSEMBLY
3	A	750028	SI	SPECIAL GRATE	MISCELLANEOUS METAL
3	A	719207	SI	SPECIAL SEWER MANHOLE	DRAINAGE COMPONENT (MANHOLE)
3	A	750005	SI	STEEL COVER	MISCELLANEOUS METAL
3	A	706539	SI	STEEL MEMBER (DEBRIS RACK)	DRAINAGE COMPONENT (GRATE)
3	A	575004	SI	TIMBER LAGGING	TIMBER
3	A	VARIES	MT	TUBULAR HANDRAILING	RAILING (TUBULAR METAL RAILING)
4	A	066800	SI	ADDITIONAL FENCE	FENCE
4	A	807500	SI	ALUMINUM CHAIN LINK FENCE (TYPE A)	FENCE

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B: Lowest - source inspection by METS
E: Electrical Branch inspects

Responsible OSM Committee
CC: Concrete
MT: Materials Testing
SI: Source Inspection
WS: Welding

Using AutoFilter Drop Down List
Autofilter On
Menu: DATA /FILTER/ AUTOFILTER
Autofilter Offn
Menu: DATA /FILTER/ AUTOFILTER

* State Furnished and Standard Bid Items Only

Tier	Inspection Priority	Bid Item*	Resp OSM Comm	Description	Category
4	A	839534	SI	ANCHOR ASSEMBLY (BREAKAWAY, TYPE M)	BARRIER (THRIE BEAM)
4	A	839529	MT	ANCHOR POST	ANCHOR POST
4	A	839523	SI	BARRIER POST	BARRIER (THRIE BEAM)
4	A	VARIES	WS	BITUMINOUS COATED STRUCTURAL STEEL PLATE PIPE	BITUMINOUS COATED STEEL PLATE PIPE
4	A	VARIES	WS	BITUMINOUS COATED STRUCTURAL STEEL PLATE PIPE ARCH	BITUMINOUS COATED STEEL PLATE PIPE
4	A	839530	SI	CABLE ANCHOR ASSEMBLY	BARRIER (THRIE BEAM)
4	A	839531	SI	CABLE ANCHOR ASSEMBLY (BREAKAWAY, TYPE A)	BARRIER (THRIE BEAM)
4	A	839532	SI	CABLE ANCHOR ASSEMBLY (BREAKAWAY, TYPE B)	BARRIER (THRIE BEAM)
4	A	839535	SI	CABLE ANCHOR ASSEMBLY (SPECIAL)	BARRIER (THRIE BEAM)
4	A	839521	SI	CABLE RAILING	RAILING (CABLE RAILING)
4	A	839527	SI	CABLE RAILING (MODIFIED)	RAILING (CABLE RAILING)
4	A	VARIES	SI	CHAIN LINK FENCE	FENCE
4	A	VARIES	SI	CHAIN LINK FENCE (EXTENSION ARM)	FENCE
4	A	800600	SI	CHAIN LINK FENCE (ROCK BARRIER)	FENCE
4	A	VARIES	SI	CHAIN LINK FENCE (RUSTIC)	FENCE
4	A	VARIES	SI	CHAIN LINK FENCE (SLATTED)	FENCE
4	A	800396	SI	CHAIN LINK FENCE (TYPE CL-1.8, 25 MM X 25 MM MESH)	FENCE
4	A	800370	SI	CHAIN LINK FENCE (TYPE CL-6, 1"X1" MESH)	FENCE
4	A	VARIES	SI	CHAIN LINK FENCE (VINYL-CLAD)	FENCE
4	A	VARIES	SI	CHAIN LINK FENCE (WITH EXTENSION ARM)	FENCE
4	A	VARIES	SI	CHAIN LINK FENCE (WITH REDWOOD LATH)	FENCE
4	A	800250	SI	CHAIN LINK FENCE ENCLOSURE	FENCE
4	A	VARIES	SI	CHAIN LINK GATE	GATE
4	A	VARIES	SI	CHAIN LINK GATE (EXTENSION ARM)	GATE
4	A	VARIES	SI	CHAIN LINK GATE (RUSTIC)	GATE
4	A	VARIES	SI	CHAIN LINK GATE (SLATTED)	GATE
4	A	VARIES	SI	CHAIN LINK GATE (VINYL-CLAD)	GATE
4	A	VARIES	SI	CHAIN LINK RAILING	RAILING (CHAIN LINK RAILING)
4	A	VARIES	SI	CHAIN LINK RAILING (MODIFIED)	RAILING (CHAIN LINK RAILING)
4	A	833039	SI	CHAIN LINK RAILING (RETAINING WALL)	RAILING (CHAIN LINK RAILING)
4	A	VARIES	SI	CHAIN LINK SLIDING GATE	GATE
4	A	839201	SI	DOUBLE METAL BEAM BARRIER	BARRIER (THRIE BEAM)
4	A	839202	SI	DOUBLE METAL BEAM BARRIER (WOOD POST)	BARRIER (THRIE BEAM)
4	A	839310	SI	DOUBLE THRIE BEAM BARRIER	BARRIER (THRIE BEAM)
4	A	839313	SI	DOUBLE THRIE BEAM BARRIER (BRIDGE)	BARRIER (THRIE BEAM)
4	A	839312	SI	DOUBLE THRIE BEAM BARRIER (STEEL POST)	BARRIER (THRIE BEAM)
4	A	839311	SI	DOUBLE THRIE BEAM BARRIER (WOOD POST)	BARRIER (THRIE BEAM)
4	A	VARIES	SI	DRIVE GATE (TYPE WM)	GATE
4	A	839553	SI	END SECTION	BARRIER (THRIE BEAM)
4	A	800003	SI	FENCE (TYPE BW, 4-STRAND)	FENCE
4	A	VARIES	SI	FENCE (TYPE BW, METAL POST)	FENCE
4	A	800005	SI	FENCE (TYPE BW, SPECIAL)	FENCE
4	A	VARIES	SI	FENCE (TYPE BW, WOOD POST)	FENCE
4	A	800060	SI	FENCE (TYPE WM AND BW)	FENCE
4	A	800051	SI	FENCE (TYPE WM, METAL POST)	FENCE
4	A	800054	SI	FENCE (TYPE WM, MODIFIED)	FENCE
4	A	800053	SI	FENCE (TYPE WM, SPECIAL)	FENCE
4	A	800052	SI	FENCE (TYPE WM, WOOD POST)	FENCE
4	A	066801	SI	GATE AND HARDWARE	GATE
4	A	801101	SI	GATEWAY	GATE
4	A	869050	SI	GUARD POST	BARRIER (THRIE BEAM)
4	A	VARIES	SI	METAL GATE	GATE
4	A	VARIES	WS	PAVED INVERT STRUCTURAL STEEL PLATE PIPE	BITUMINOUS COATED STEEL PLATE PIPE
4	A	800711	SI	PICKET FENCING	FENCE

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4	A	800712	SI	PICKET FENCING, OVERCROSSING	FENCE
4	A	839518	MT	RAIL POST END ANCHOR	ANCHOR POST
4	A	800707	SI	REDWOOD FENCE	FENCE
4	A	839522	SI	REMOVABLE BARRIER POST	BARRIER (THRIE BEAM)
4	A	839570	SI	RETURN SECTION	BARRIER (THRIE BEAM)
4	A	839545	SI	RETURN SECTION (THRIE BEAM BARRIER)	BARRIER (THRIE BEAM)
4	A	VARIES	MT	ROADSIDE SIGN	ROADSIDE SIGN
4	A	809800	SI	ROCK FENCE	FENCE
4	A	804201	SI	ROLLING CHAIN LINK GATE	GATE
4	A	800706	SI	RUSTIC RAIL FENCE	FENCE
4	A	839103	SI	SINGLE METAL BEAM BARRIER (STEEL POST)	BARRIER (THRIE BEAM)
4	A	839102	SI	SINGLE METAL BEAM BARRIER (WOOD POST)	BARRIER (THRIE BEAM)
4	A	839301	SI	SINGLE THRIE BEAM BARRIER	BARRIER (THRIE BEAM)
4	A	839304	SI	SINGLE THRIE BEAM BARRIER (BRIDGE)	BARRIER (THRIE BEAM)
4	A	839303	SI	SINGLE THRIE BEAM BARRIER (STEEL POST)	BARRIER (THRIE BEAM)
4	A	839302	SI	SINGLE THRIE BEAM BARRIER (WOOD POST)	BARRIER (THRIE BEAM)
4	A	800710	SI	SPECIAL FENCE (NO CLIMB)	FENCE
4	A	839569	SI	TERMINAL ANCHOR ASSEMBLY (TYPE CA)	BARRIER (THRIE BEAM)
4	A	839568	SI	TERMINAL ANCHOR ASSEMBLY (TYPE SFT)	BARRIER (THRIE BEAM)
4	A	839537	SI	TERMINAL CONNECTOR	BARRIER (THRIE BEAM)
4	A	839547	SI	TERMINAL CONNECTOR (THRIE BEAM BARRIER)	BARRIER (THRIE BEAM)
4	A	839546	SI	TERMINAL SECTION (THRIE BEAM BARRIER)	BARRIER (THRIE BEAM)
4	A	839550	SI	TERMINAL SECTION (TYPE A)	BARRIER (THRIE BEAM)
4	A	839551	SI	TERMINAL SECTION (TYPE B)	BARRIER (THRIE BEAM)
4	A	839552	SI	TERMINAL SECTION (TYPE C)	BARRIER (THRIE BEAM)
4	A	839557	SI	TERMINAL SECTION (TYPE C) (UNGALVANIZED)	BARRIER (THRIE BEAM)
4	A	839558	SI	TERMINAL SECTION (TYPE M)	BARRIER (THRIE BEAM)
4	A	839566	SI	TERMINAL SYSTEM (TYPE CAT)	BARRIER (THRIE BEAM)
4	A	839567	SI	TERMINAL SYSTEM (TYPE CAT) BACKUP	BARRIER (THRIE BEAM)
4	A	839559	SI	TERMINAL SYSTEM (TYPE ET)	BARRIER (THRIE BEAM)
4	A	839565	SI	TERMINAL SYSTEM (TYPE SRT)	BARRIER (THRIE BEAM)
4	A	575003	SI	TIMBER POST	TIMBER
4	A	800705	SI	WIRE MESH AND WOOD FENCE	FENCE
4	A	801100	SI	WIRE MESH GATE	FENCE
4	A	VARIES	SI	WIRE MESH GATE	GATE
4	A	839515	SI	WOOD BARRIER POST	BARRIER (THRIE BEAM)
4	A	800701	SI	WOOD FENCE	FENCE
2	B	653341	CC	60" REINFORCED CONCRETE PIPE SIPHON (CLASS III, RUBBER GASKET JOINT)	RCP 1500 MM AND LARGER
2	B	994650	SI	BUILDING WORK	BUILDING WORK
2	B	VARIES	CC	CONCRETE BARRIER	BARRIER (CONCRETE)
2	B	VARIES	CC	CONCRETE BARRIER (TYPE 50/60)	BARRIER (CONCRETE, TYPE 50/60)
2	B	VARIES	CC	CONCRETE FLARED END SECTION	RCP 1500 MM AND LARGER
2	B	VARIES	SI	EARTH RETAINING STRUCTURE (MSE WALL) - SOIL REINFORCEMENT	EARTHWORK
2	B	VARIES	CC	FURNISH PRECAST PRESTRESSED CONCRETE PANEL	NON-STRUCTURAL PRECAST CONCRETE
2	B	VARIES	CC	JACKED OVAL SHAPED REINFORCED CONCRETE PIPE (CLASS III)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	JACKED REINFORCED CONCRETE PIPE (CLASS II)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	JACKED REINFORCED CONCRETE PIPE (CLASS III)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	JACKED REINFORCED CONCRETE PIPE (CLASS III, RUBBER GASKET JOINT)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	JACKED REINFORCED CONCRETE PIPE (CLASS IV)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	JACKED REINFORCED CONCRETE PIPE (CLASS IV, RUBBER GASKET JOINT)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	JACKED REINFORCED CONCRETE PIPE (CLASS V)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	JACKED REINFORCED CONCRETE PIPE (CLASS V, RUBBER GASKET JOINT)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	MASONRY BLOCK WALL	MASONRY BLOCK
2	B	VARIES	MT	METAL TUBE BRIDGE RAILING	NON-STRUCTURAL PRECAST CONCRETE

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2	B	750497	WS	MISCELLANEOUS METAL (RESTRAINER - BAR TYPE)	BRIDGE RESTRAINER UNITS
2	B	750498	WS	MISCELLANEOUS METAL (RESTRAINER - CABLE TYPE)	BRIDGE RESTRAINER UNITS
2	B	750496	WS	MISCELLANEOUS METAL (RESTRAINER - PIPE TYPE)	BRIDGE RESTRAINER UNITS
2	B	750499	WS	MISCELLANEOUS METAL (RESTRAINER - ROD TYPE)	BRIDGE RESTRAINER UNITS
2	B	750503	WS	MISCELLANEOUS METAL (RESTRAINER)	BRIDGE RESTRAINER UNITS
2	B	750506	WS	MISCELLANEOUS METAL (TIE ROD)	MISCELLANEOUS METAL
2	B	VARIES	CC	OVAL SHAPED REINFORCED CONCRETE PIPE (CLASS III)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	OVAL SHAPED REINFORCED CONCRETE PIPE (CLASS III)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	OVAL SHAPED REINFORCED CONCRETE PIPE (CLASS IV)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	OVAL SHAPED REINFORCED CONCRETE PIPE (CLASS V)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	PRECAST CONCRETE PIPE ENERGY DISSIPATOR	RCP 1500 MM AND LARGER
2	B	VARIES	CC	PRECAST CONCRETE PIPE MANHOLE	RCP 1500 MM AND LARGER
2	B	VARIES	CC	PRECAST CONCRETE PIPE RISER	RCP 1500 MM AND LARGER
2	B	VARIES	CC	PRECAST CONCRETE PIPE SEWER MANHOLE	RCP 1500 MM AND LARGER
2	B	513504	CC	PRECAST EXPOSED AGGREGATE PANEL	NON-STRUCTURAL PRECAST CONCRETE
2	B	VARIES	CC	REINFORCED CONCRETE PIPE	RCP 1500 MM AND LARGER
2	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS II)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS II, RUBBER GASKET JOINT)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS III SPECIAL)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS III)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS III, RUBBER GASKET JOINT)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS IV SPECIAL)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS IV)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS IV, RUBBER GASKET JOINT)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS V SPECIAL)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS V)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS V, RUBBER GASKET JOINT)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	REINFORCED CONCRETE PIPE (RUBBER GASKET JOINT)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	REINFORCED CONCRETE PIPE (SPECIAL)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	REINFORCED CONCRETE SEWER PIPE (CLASS III, RUBBER GASKET JOINT)	RCP 1500 MM AND LARGER
2	B	VARIES	CC	RETAINING WALL	RETAINING WALL
2	B	517962	CC	SOUND WALL (BARRIER) (PRECAST CONCRETE PANEL)	NON-STRUCTURAL PRECAST CONCRETE
2	B	VARIES	CC	SOUND WALL (MASONRY BLOCK)	MASONRY BLOCK
2	B	517992	CC	SOUND WALL (PRECAST CONCRETE PANEL)	NON-STRUCTURAL PRECAST CONCRETE
2	B	517991	CC	SOUND WALL PRECAST CONCRETE	NON-STRUCTURAL PRECAST CONCRETE
2	B	VARIES	CC	STANDPIPE	RCP 1500 MM AND LARGER
2	B	557053	WS	STEEL CRIB WALL (TYPE C)	STRUCTURAL STEEL
2	B	557054	WS	STEEL CRIB WALL (TYPE D)	STRUCTURAL STEEL
2	B	500050	MT	TIEBACK ANCHOR	TIEBACK ANCHOR
2	B	500055	MT	TIEBACK SOLDIER PILE WALL	TIEBACK ANCHOR
2	B	500060	MT	TIEDOWN ANCHOR	TIEBACK ANCHOR
2	B	575040	SI	TIMBER CATWALK	TIMBER
2	B	575020	SI	TIMBER CRIB WALL	TIMBER
2	B	575005	SI	TIMBER RETAINING WALL	TIMBER
3	B	658801	CC	1220 MM X 670 MM OVAL SHAPED REINFORCED CONCRETE PIPE (CLASS V)	RCP < 1500 MM
3	B	VARIES	SI	30 DEGREE CORRUGATED STEEL PIPE ELBOW	STEEL PIPE
3	B	654824	CC	36" REINFORCED CONCRETE PRESSURE PIPE (CLASS III, RUBBER GASKET JOINT)	RCP < 1500 MM
3	B	VARIES	SI	45 DEGREE CORRUGATED STEEL PIPE ELBOW	STEEL PIPE
3	B	702744	SI	48" BITUMINOUS COATED STEEL PIPE ENERGY DISSIPATOR (.079" THICK)	BITUMINOUS COATED STEEL PIPE
3	B	VARIES	SI	60 DEGREE CORRUGATED STEEL PIPE ELBOW	STEEL PIPE
3	B	VARIES	CC	ACCESS SEWER MANHOLE	RCP < 1500 MM
3	B	VARIES	SI	ALTERNATIVE ENTRANCE TAPER	STEEL PIPE
3	B	VARIES	CC	ALTERNATIVE PIPE DOWNDRAIN	RCP < 1500 MM
3	B	VARIES	CC	ALTERNATIVE PIPE DOWNDRAIN (TYPE A)	RCP < 1500 MM

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3	B	VARIES	CC	ALTERNATIVE PIPE DOWNDRAIN (TYPE B)	RCP < 1500 MM
3	B	VARIES	CC	ALTERNATIVE PIPE DOWNDRAIN (TYPE C)	RCP < 1500 MM
3	B	VARIES	CC	ALTERNATIVE PIPE DOWNDRAIN (TYPE D)	RCP < 1500 MM
3	B	VARIES	CC	ALTERNATIVE PIPE INLET	RCP < 1500 MM
3	B	VARIES	CC	ALTERNATIVE PIPE INLET (TYPE C)	RCP < 1500 MM
3	B	VARIES	CC	ALTERNATIVE PIPE RISER	RCP < 1500 MM
3	B	VARIES	CC	ALTERNATIVE PIPE RISER (TYPE C)	RCP < 1500 MM
3	B	VARIES	CC	ALTERNATIVE PIPE UNDERDRAIN	RCP < 1500 MM
3	B	VARIES	CC	ALTERNATIVE PIPE UNDERDRAIN (TYPE A)	RCP < 1500 MM
3	B	VARIES	CC	ALTERNATIVE PIPE UNDERDRAIN (TYPE B)	RCP < 1500 MM
3	B	VARIES	CC	ALTERNATIVE PIPE UNDERDRAIN (TYPE C)	RCP < 1500 MM
3	B	VARIES	CC	ALTERNATIVE PIPE UNDERDRAIN (TYPE D)	RCP < 1500 MM
3	B	518220	CC	ALTERNATIVE SOUND WALL	MASONRY BLOCK
3	B	VARIES	SI	ANCHOR ASSEMBLY	STEEL PIPE
3	B	VARIES	SI	ASBESTOS BONDED BITUMINOUS COATED ENTRANCE TAPER	BITUMINOUS COATED STEEL PIPE
3	B	VARIES	SI	BITUMINOUS COATED CORRUGATED ALUMINUM PIPE DOWNDRAIN	BITUMINOUS COATED ALUMINUM PIPE
3	B	VARIES	SI	BITUMINOUS COATED CORRUGATED STEEL ECCENTRIC REDUCER	BITUMINOUS COATED STEEL PIPE
3	B	VARIES	SI	BITUMINOUS COATED CORRUGATED STEEL FLUME DOWNDRAIN	BITUMINOUS COATED STEEL PIPE
3	B	VARIES	SI	BITUMINOUS COATED CORRUGATED STEEL PIPE ELBOW	BITUMINOUS COATED STEEL PIPE
3	B	VARIES	SI	BITUMINOUS COATED CORRUGATED STEEL PIPE ENERGY DISSIPATOR	BITUMINOUS COATED STEEL PIPE
3	B	VARIES	SI	BITUMINOUS COATED CORRUGATED STEEL PIPE INLET	BITUMINOUS COATED STEEL PIPE
3	B	VARIES	SI	BITUMINOUS COATED CORRUGATED STEEL PIPE MANHOLE	BITUMINOUS COATED STEEL PIPE
3	B	VARIES	SI	BITUMINOUS COATED CORRUGATED STEEL PIPE RISER	BITUMINOUS COATED STEEL PIPE
3	B	VARIES	SI	BITUMINOUS COATED CORRUGATED STEEL REDUCER	BITUMINOUS COATED STEEL PIPE
3	B	702700	SI	BITUMINOUS COATED DOWNDRAIN ENERGY DISSIPATOR	BITUMINOUS COATED STEEL PIPE
3	B	VARIES	SI	BITUMINOUS COATED DOWNDRAIN SLIP JOINT	BITUMINOUS COATED STEEL PIPE
3	B	VARIES	SI	BITUMINOUS COATED ENTRANCE TAPER	BITUMINOUS COATED STEEL PIPE
3	B	691901	SI	BITUMINOUS COATED FLUME DOWNDRAIN	BITUMINOUS COATED STEEL PIPE
3	B	VARIES	SI	BITUMINOUS COATED HALF-CIRCLE PIPE DOWNDRAIN	BITUMINOUS COATED STEEL PIPE
3	B	VARIES	SI	BITUMINOUS COATED PAVED INVERT CORRUGATED ALUMINUM PIPE DOWNDRAIN	BITUMINOUS COATED ALUMINUM PIPE
3	B	VARIES	SI	BITUMINOUS COATED PAVED INVERT CORRUGATED STEEL ECCENTRIC REDUCER	BITUMINOUS COATED STEEL PIPE
3	B	VARIES	SI	BITUMINOUS COATED STEEL FLARED END PIPE ARCH SECTION	BITUMINOUS COATED STEEL PIPE
3	B	VARIES	SI	BITUMINOUS COATED STEEL FLARED END SECTION	BITUMINOUS COATED STEEL PIPE
3	B	VARIES	SI	BITUMINOUS COATED TAPERED INLET	BITUMINOUS COATED STEEL PIPE
3	B	719301	CC	BRICK MANHOLE	MASONRY BLOCK
3	B	719215	CC	BRICK SEWER MANHOLE	MASONRY BLOCK
3	B	750505	WS	BRIDGE DECK DRAINAGE SYSTEM	BRIDGE DECK DRAINAGE SYSTEM
3	B	692409	SI	CABLE ANCHORAGE SYSTEM	STEEL PIPE
3	B	692410	SI	CABLE ANCHORAGE SYSTEM (TYPE A)	STEEL PIPE
3	B	692411	SI	CABLE ANCHORAGE SYSTEM (TYPE B)	STEEL PIPE
3	B	VARIES	SI	CLEANOUT ELBOW	STEEL PIPE
3	B	692381	SI	CONCRETE ANCHOR AND CABLE ASSEMBLY	STEEL PIPE
3	B	VARIES	CC	CONCRETE FLARED END SECTION	RCP < 1500 MM
3	B	833070	CC	CONCRETE RAILING	RAILING (CONCRETE RAILING)
3	B	719210	CC	CONCRETE SEWER MANHOLE	RCP < 1500 MM
3	B	719213	CC	CONCRETE SEWER MANHOLE (TYPE C)	RCP < 1500 MM
3	B	691201	SI	CORRUGATED ALUMINUM FLUME DOWNDRAIN	ALUMINUM PIPE
3	B	VARIES	SI	CORRUGATED ALUMINUM PIPE	ALUMINUM PIPE
3	B	VARIES	SI	CORRUGATED ALUMINUM PIPE DOWNDRAIN	ALUMINUM PIPE
3	B	VARIES	SI	CORRUGATED STEEL ADAPTOR	STEEL PIPE
3	B	VARIES	SI	CORRUGATED STEEL ECCENTRIC REDUCER	STEEL PIPE
3	B	VARIES	SI	CORRUGATED STEEL FLUME DOWNDRAIN	STEEL PIPE
3	B	VARIES	SI	CORRUGATED STEEL PIPE	STEEL PIPE
3	B	VARIES	SI	CORRUGATED STEEL PIPE ARCH	STEEL PIPE

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3	B	VARIES	SI	CORRUGATED STEEL PIPE CONDUIT	STEEL PIPE
3	B	VARIES	SI	CORRUGATED STEEL PIPE DOWNDRAIN	STEEL PIPE
3	B	VARIES	SI	CORRUGATED STEEL PIPE ELBOW	STEEL PIPE
3	B	VARIES	SI	CORRUGATED STEEL PIPE ENERGY DISSIPATOR	STEEL PIPE
3	B	VARIES	SI	CORRUGATED STEEL PIPE INLET	STEEL PIPE
3	B	VARIES	SI	CORRUGATED STEEL PIPE INVERT PLANKING	STEEL PIPE
3	B	VARIES	SI	CORRUGATED STEEL PIPE MANHOLE	STEEL PIPE
3	B	VARIES	SI	CORRUGATED STEEL PIPE RISER	STEEL PIPE
3	B	VARIES	SI	CORRUGATED STEEL PIPE SIPHON	STEEL PIPE
3	B	VARIES	SI	CORRUGATED STEEL REDUCER	STEEL PIPE
3	B	703000	SI	CULVERT INVERT PLANKING	STEEL PIPE
3	B	820107	SI	DELINEATOR (CLASS 1)	ROADSIDE MARKER
3	B	820108	SI	DELINEATOR (CLASS 2)	ROADSIDE MARKER
3	B	820105	SI	DELINEATOR (SPECIAL)	ROADSIDE MARKER
3	B	702600	SI	DOWNDRAIN ENERGY DISSIPATOR	STEEL PIPE
3	B	VARIES	SI	DOWNDRAIN SLIP JOINT	STEEL PIPE
3	B	719220	CC	DROP SEWER MANHOLE	RCP < 1500 MM
3	B	VARIES	CC	EARTH RETAINING STRUCTURE	EARTHWORK
3	B	VARIES	SI	ENTRANCE TAPER	STEEL PIPE
3	B	VARIES	SI	FLUME ANCHOR ASSEMBLY	STEEL PIPE
3	B	VARIES	SI	FLUME DOWNDRAIN	STEEL PIPE
3	B	719222	CC	FLUSH SEWER MANHOLE	RCP < 1500 MM
3	B	722020	MT	GABION	GABION
3	B	VARIES	SI	GALVANIZED STEEL CASING	STEEL PIPE
3	B	VARIES	SI	GALVANIZED STEEL PIPE (SUPPLY LINE ON BRIDGE)	STEEL IRRIGATION PIPE
3	B	VARIES	SI	GALVANIZED STEEL PIPE DOWNDRAIN	STEEL PIPE
3	B	703233	SI	GRATED LINE DRAIN	STEEL PIPE
3	B	820118	SI	GUARD RAILING DELINEATOR	ROADSIDE MARKER
3	B	VARIES	SI	HALF-CIRCLE ANCHOR ASSEMBLY	STEEL PIPE
3	B	VARIES	SI	HALF-CIRCLE PIPE DOWNDRAIN	STEEL PIPE
3	B	VARIES	SI	JACKED CORRUGATED STEEL PIPE	STEEL PIPE
3	B	VARIES	CC	JACKED REINFORCED CONCRETE PIPE (CLASS II)	RCP < 1500 MM
3	B	VARIES	CC	JACKED REINFORCED CONCRETE PIPE (CLASS III SPECIAL)	RCP < 1500 MM
3	B	VARIES	CC	JACKED REINFORCED CONCRETE PIPE (CLASS III)	RCP < 1500 MM
3	B	VARIES	CC	JACKED REINFORCED CONCRETE PIPE (CLASS III, RUBBER GASKET JOINT)	RCP < 1500 MM
3	B	VARIES	CC	JACKED REINFORCED CONCRETE PIPE (CLASS IV)	RCP < 1500 MM
3	B	VARIES	CC	JACKED REINFORCED CONCRETE PIPE (CLASS IV, RUBBER GASKET JOINT)	RCP < 1500 MM
3	B	VARIES	CC	JACKED REINFORCED CONCRETE PIPE (CLASS V SPECIAL)	RCP < 1500 MM
3	B	VARIES	CC	JACKED REINFORCED CONCRETE PIPE (CLASS V)	RCP < 1500 MM
3	B	VARIES	CC	JACKED REINFORCED CONCRETE PIPE (CLASS V, RUBBER GASKET JOINT)	RCP < 1500 MM
3	B	VARIES	CC	JACKED REINFORCED CONCRETE SEWER PIPE (CLASS III)	RCP < 1500 MM
3	B	VARIES	CC	JACKED REINFORCED CONCRETE SEWER PIPE (CLASS V, RUBBER GASKET JOINT)	RCP < 1500 MM
3	B	519080	SI	JOINT SEAL	JOINT SEAL (TYPE B)
3	B	519081	SI	JOINT SEAL (MR 1/2")	JOINT SEAL (TYPE B)
3	B	519120	SI	JOINT SEAL (MR 15 MM)	JOINT SEAL (TYPE B)
3	B	519117	SI	JOINT SEAL (MR 30 MM)	JOINT SEAL (TYPE B)
3	B	519142	SI	JOINT SEAL (MR 40 MM)	JOINT SEAL (TYPE B)
3	B	519144	SI	JOINT SEAL (MR 50 MM)	JOINT SEAL (TYPE B)
3	B	519121	SI	JOINT SEAL (TYPE B - MR 30 MM)	JOINT SEAL (TYPE B)
3	B	519122	SI	JOINT SEAL (TYPE B - MR 40 MM)	JOINT SEAL (TYPE B)
3	B	519123	SI	JOINT SEAL (TYPE B - MR 50 MM)	JOINT SEAL (TYPE B)
3	B	519086	SI	JOINT SEAL (TYPE B-MR 1 1/2")	JOINT SEAL (TYPE B)
3	B	519085	SI	JOINT SEAL (TYPE B-MR 1")	JOINT SEAL (TYPE B)
3	B	519087	SI	JOINT SEAL (TYPE B-MR 2")	JOINT SEAL (TYPE B)

Tier-Failures
1: Catastrophic consequence - Must inspect
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3: linterruptioin in service - Periodically inspect
4: Loss of funds to repair item - Periodically inspect

Inspection Priority
A: Highest - source inspection by METS
B: Lowest - source inspection by METS
E: Electrical Branch inspects

Responsible OSM Committee
CC: Concrete
MT: Materials Testing
SI: Source Inspection
WS: Welding

Using AutoFilter Drop Down List
Autofilter On
Menu: DATA /FILTER/ AUTOFILTER
Autofilter Offn
Menu: DATA /FILTER/ AUTOFILTER

* State Furnished and Standard Bid Items Only

Tier	Inspection Priority	Bid Item*	Resp OSM Comm	Description	Category
3	B	820114	SI	KILOMETER POST MARKER	ROADSIDE MARKER
3	B	719300	CC	MANHOLE	RCP < 1500 MM
3	B	820101	SI	MARKER	ROADSIDE MARKER
3	B	820112	SI	MARKER (CULVERT)	ROADSIDE MARKER
3	B	066073	SI	MARKER PANELS	ROADSIDE MARKER
3	B	518205	CC	MASONRY BLOCK VENEER	MASONRY BLOCK
3	B	518201	CC	MASONRY BLOCK WALL	MASONRY BLOCK
3	B	820109	SI	METAL MARKER POST	ROADSIDE MARKER
3	B	820110	SI	MILEPOST MARKER	ROADSIDE MARKER
3	B	VARIES	MT	NEOPRENE STRIP	WATERSTOP
3	B	VARIES	SI	NESTABLE CORRUGATED STEEL PIPE	STEEL PIPE
3	B	VARIES	SI	NON-PERFORATED STEEL PIPE UNDERDRAIN	STEEL PIPE
3	B	VARIES	CC	NON-REINFORCED CONCRETE PIPE	NON-REINFORCED CONCRETE PIPE
3	B	VARIES	CC	NON-REINFORCED CONCRETE PIPE (EXTRA STRENGTH)	NON-REINFORCED CONCRETE PIPE
3	B	VARIES	CC	NON-REINFORCED CONCRETE SEWER PIPE	RCP < 1500 MM
3	B	VARIES	CC	NON-REINFORCED CONCRETE SEWER PIPE (EXTRA STRENGTH)	RCP < 1500 MM
3	B	VARIES	CC	NON-REINFORCED CONCRETE SEWER PIPE (RUBBER GASKET JOINT)	RCP < 1500 MM
3	B	VARIES	SI	OBJECT MARKER	ROADSIDE MARKER
3	B	719221	CC	OFFSET SEWER MANHOLE	RCP < 1500 MM
3	B	VARIES	CC	OVAL SHAPED REINFORCED CONCRETE PIPE (CLASS II)	RCP < 1500 MM
3	B	VARIES	CC	OVAL SHAPED REINFORCED CONCRETE PIPE (CLASS III)	RCP < 1500 MM
3	B	VARIES	CC	OVAL SHAPED REINFORCED CONCRETE PIPE (CLASS III, RUBBER GASKET JOINT)	RCP < 1500 MM
3	B	VARIES	CC	OVAL SHAPED REINFORCED CONCRETE PIPE (CLASS IV)	RCP < 1500 MM
3	B	VARIES	SI	PART CIRCLE CORRUGATED STEEL CULVERT	STEEL PIPE
3	B	700100	SI	PART CIRCLE CORRUGATED STEEL PIPE	STEEL PIPE
3	B	VARIES	SI	PERFORATED STEEL PIPE UNDERDRAIN	STEEL PIPE
3	B	VARIES	SI	PIPE DOWNDRAIN	STEEL PIPE
3	B	VARIES	CC	PRECAST CONCRETE PIPE ENERGY DISSIPATOR	RCP < 1500 MM
3	B	VARIES	CC	PRECAST CONCRETE PIPE INLET	RCP < 1500 MM
3	B	719315	CC	PRECAST CONCRETE PIPE MANHOLE	RCP < 1500 MM
3	B	VARIES	CC	PRECAST CONCRETE PIPE MANHOLE	RCP < 1500 MM
3	B	VARIES	CC	PRECAST CONCRETE PIPE MANHOLE (EXTRA STRENGTH)	RCP < 1500 MM
3	B	VARIES	CC	PRECAST CONCRETE PIPE RISER	RCP < 1500 MM
3	B	VARIES	CC	PRECAST CONCRETE PIPE SECTION	RCP < 1500 MM
3	B	VARIES	CC	PRECAST CONCRETE PIPE SEWER MANHOLE	RCP < 1500 MM
3	B	VARIES	WS	PUMPING PLANT METAL WORK	PUMPING PLANT METAL WORK
3	B	820125	SI	REFLECTOR ASSEMBLY	ROADSIDE MARKER
3	B	VARIES	CC	REINFORCED CONCRETE PIPE	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS II SPECIAL)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS II)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS II, RUBBER GASKET JOINT)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS III SPECIAL)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS III)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS III, RUBBER GASKET JOINT)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS IV SPECIAL)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS IV SPECIAL, RUBBER GASKET JOINT)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS IV)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS IV, RUBBER GASKET JOINT)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS V SPECIAL)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS V)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE PIPE (CLASS V, RUBBER GASKET JOINT)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE PIPE (RUBBER GASKET JOINT)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE PIPE (SPECIAL)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE PIPE RISER	RCP < 1500 MM

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Tier	Inspection Priority	Bid Item*	Resp OSM Comm	Description	Category
3	B	VARIES	CC	REINFORCED CONCRETE PIPE SIPHON (CLASS III, RUBBER GASKET JOINT)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE PRESSURE PIPE (CLASS III)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE SEWER PIPE (CLASS III SPECIAL)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE SEWER PIPE (CLASS III)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE SEWER PIPE (CLASS III, RUBBER GASKET JOINT)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE SEWER PIPE (CLASS IV SPECIAL)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE SEWER PIPE (CLASS IV)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE SEWER PIPE (CLASS IV, RUBBER GASKET JOINT)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE SEWER PIPE (CLASS V SPECIAL)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE SEWER PIPE (CLASS V)	RCP < 1500 MM
3	B	VARIES	CC	REINFORCED CONCRETE SEWER PIPE (CLASS V, RUBBER GASKET JOINT)	RCP < 1500 MM
3	B	518042	MT	REPLACE BEARING	BEARING PAD
3	B	518040	MT	REPLACE BEARING PAD	BEARING PAD
3	B	VARIES	CC	SEWER MANHOLE	RCP < 1500 MM
3	B	721811	CC	SLOPE PAVING (MASONRY BLOCK)	MASONRY BLOCK
3	B	VARIES	SI	SLOTTED CORRUGATED STEEL PIPE	STEEL PIPE
3	B	VARIES	SI	SLOTTED CORRUGATED STEEL PIPE RISER	STEEL PIPE
3	B	820115	SI	SNOW POLE MARKER	ROADSIDE MARKER
3	B	490305	SI	SOLDIER PILE	TIMBER PILE
3	B	518001	CC	SOUND WALL	MASONRY BLOCK
3	B	517950	CC	SOUND WALL (BARRIER)	MASONRY BLOCK
3	B	517961	CC	SOUND WALL (BARRIER) (MASONRY BLOCK)	MASONRY BLOCK
3	B	518002	CC	SOUND WALL (MASONRY BLOCK)	MASONRY BLOCK
3	B	517960	CC	SOUND WALL (RETAINING WALL)	MASONRY BLOCK
3	B	820190	SI	SPECIAL MARKER	ROADSIDE MARKER
3	B	VARIES	SI	SPECIAL SLIP JOINT	STEEL PIPE
3	B	694903	SI	SPILLWAY ASSEMBLY	STEEL PIPE
3	B	VARIES	CC	STANDPIPE	RCP < 1500 MM
3	B	VARIES	SI	STEEL FLARED END PIPE ARCH SECTION	STEEL PIPE
3	B	VARIES	SI	STEEL FLARED END SECTION	STEEL PIPE
3	B	VARIES	SI	SUPPLY LINE (BRIDGE)	STEEL IRRIGATION PIPE
3	B	VARIES	SI	TAPERED INLET	STEEL PIPE
3	B	719230	CC	TERMINAL SEWER MANHOLE	RCP < 1500 MM
3	B	820111	SI	UNDERDRAIN MARKER	ROADSIDE MARKER
3	B	VARIES	MT	WATERSTOP	WATERSTOP
4	B	570115	SI	ABUTMENT LUMBER BLOCKING	TIMBER
4	B	518009	SI	ACCESS GATE	GATE
4	B	518010	SI	ACCESS GATE (SOUND WALL)	GATE
4	B	VARIES	SI	ALFALFA VALVE	DRAINAGE COMPONENT (GATE)
4	B	VARIES	SI	AUTOMATIC DRAINAGE GATE	DRAINAGE COMPONENT (GATE)
4	B	994011	CC	CONCRETE BLOCK PAVER	MISCELLANEOUS PRECAST CONCRETE
4	B	839512	SI	CONCRETE HEADLIGHT GLARE SCREEN	GLARE SCREEN
4	B	VARIES	SI	CORRUGATED HIGH DENSITY POLYETHYLENE PIPE CONDUIT	CORRUGATED HDPE PIPE CONDUIT
4	B	VARIES	SI	DRAINAGE PUMPING EQUIPMENT	DRAINAGE PUMPING EQUIPMENT
4	B	705799	SI	GATE RISER ASSEMBLY	DRAINAGE COMPONENT (GATE)
4	B	VARIES	SI	GATE VALVE	DRAINAGE COMPONENT (GATE)
4	B	705901	SI	GATE VALVE ASSEMBLY	DRAINAGE COMPONENT (GATE)
4	B	VARIES	SI	GATE VALVE W/ BYPASS VALVE	DRAINAGE COMPONENT (GATE)
4	B	681132	SI	GEOCOMPOSITE DRAIN	GEOCOMPOSITE DRAIN
4	B	VARIES	CC	GROUT	GROUT
4	B	839511	SI	HEADLIGHT GLARE PROTECTION	GLARE SCREEN
4	B	839510	SI	HEADLIGHT GLARE SCREEN	GLARE SCREEN
4	B	VARIES	SI	HEAVY DUTY AUTOMATIC DRAINAGE GATE	DRAINAGE COMPONENT (GATE)
4	B	VARIES	SI	METAL TURNOUT GATE	DRAINAGE COMPONENT (GATE)

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* State Furnished and Standard Bid Items Only

Tier	Inspection Priority	Bid Item*	Resp OSM Comm	Description	Category
4	B	VARIES	SI	PUMPING PLANT EQUIPMENT	DRAINAGE PUMPING EQUIPMENT
4	B	VARIES	SI	SLIDE HEADGATE	DRAINAGE COMPONENT (GATE)
4	B	VARIES	SI	SLIDE HEADGATE AND AUTOMATIC DRAINAGE GATE	DRAINAGE COMPONENT (GATE)
4	B	570120	SI	TREATED LUMBER AND TIMBER	TIMBER
4	B	570130	SI	UNTREATED LUMBER AND TIMBER	TIMBER

EXHIBIT 2-F

Notice Of Materials To Be Used For Design-Build (CEM – 3101DB)

STATE OF CALIFORNIA * DEPARTMENT OF TRANSPORTATION

NOTICE OF MATERIALS TO BE USED FOR DESIGN-BUILD

CEM-3101DB (REV 03/2012) CT#7541-3511-1-DB

ADA Notice

For individuals with sensory disabilities this document is available in alternate formats. For information call (916) 654-6410 or TDD (916) 654-3880 or write Records and Forms Management, 1120 N Street, MS-89, Sacramento, Ca 95814

To (Resident Engineer): _____ Date: _____

You are hereby notified that materials required for use under Contract No. (1) _____

Dist._____ Co. _____ Rte. _____ P.M. _____

will be obtained from the following sources:

Item Category (2)	Item Code (3)	Item Description (4)	Item Component (5)	Item Sub Component (5)	Manufacturer/Provider Names(s) and Address(es) (6)

It is requested that you arrange for sampling, testing and inspection of materials prior to delivery in accordance with Section 6 of the Standard Specifications. It is understood that source inspection does not relieve the design builder of the full responsibility for incorporating into the work, materials that comply in all respects with the contract plans and specifications. Nor does it preclude the subsequent rejection of materials found to be unsuitable.

Yours Truly,

Contractor:		
Address:		
Business Phone:	Business Fax:	E-Mail:

(7) Materials Administrator, Mail Station #5
Materials Engineering & Testing Services
5900 Folsom Blvd, Sacramento, CA 95819
Fax: (916) 227-7084

Construction Senior Engineer

Design-Builder File

District Construction Office

EXHIBIT 2-G

Inspection Request Form (TL – 38DB)

CALTRANS
OFFICE OF STRUCTURAL MATERIALS
<<SELECT STREET ADDRESS>>
<<SELECT CITY, STATE, ZIP>>

PHONE: <<SELECT PHONE #>> **FAX: <<SELECT FAX #>>**

SCHEDULED DATE: _____ **INSPECTOR ASSIGNED:** _____

OR ☐ **MATERIAL WILL NOT BE INSPECTED AT THE SOURCE AT THIS TIME**

CONFIRMED BY:

This section is for METS LAB use only

INSPECTION REQUEST FOR DESIGN-BUILD

NUMBER OF PAGES INCLUDING COVER PAGE: (_____)

CONTRACT NO: _____ **INSPECTION DATE REQUESTED:** _____

(EA – XX-XXXXXX)

Requests must be received at least 2 business days prior to the inspection date requested. One week notice is required locations outside the State of California.

MATERIALS OR ACTIVITIES TO BE INSPECTED:

ITEM CATEGORY	MATERIAL DESCRIPTION	QUANTITY TO BE INSPECTED

☐ **WELDING** (Shop / Field) ☐ **PROCEDURE/QUALIFICATION TEST** ☐ **CONCRETE**

Please circle.

☐ **OTHER** _____

COMMENTS: _____

COMPANY NAME: _____ **E-MAIL:** _____

PHONE: ( ) _____ **FAX: ( ) _____**

ADDRESS / CITY / ZIP CODE: _____

PERSON REQUESTING INSPECTION: _____

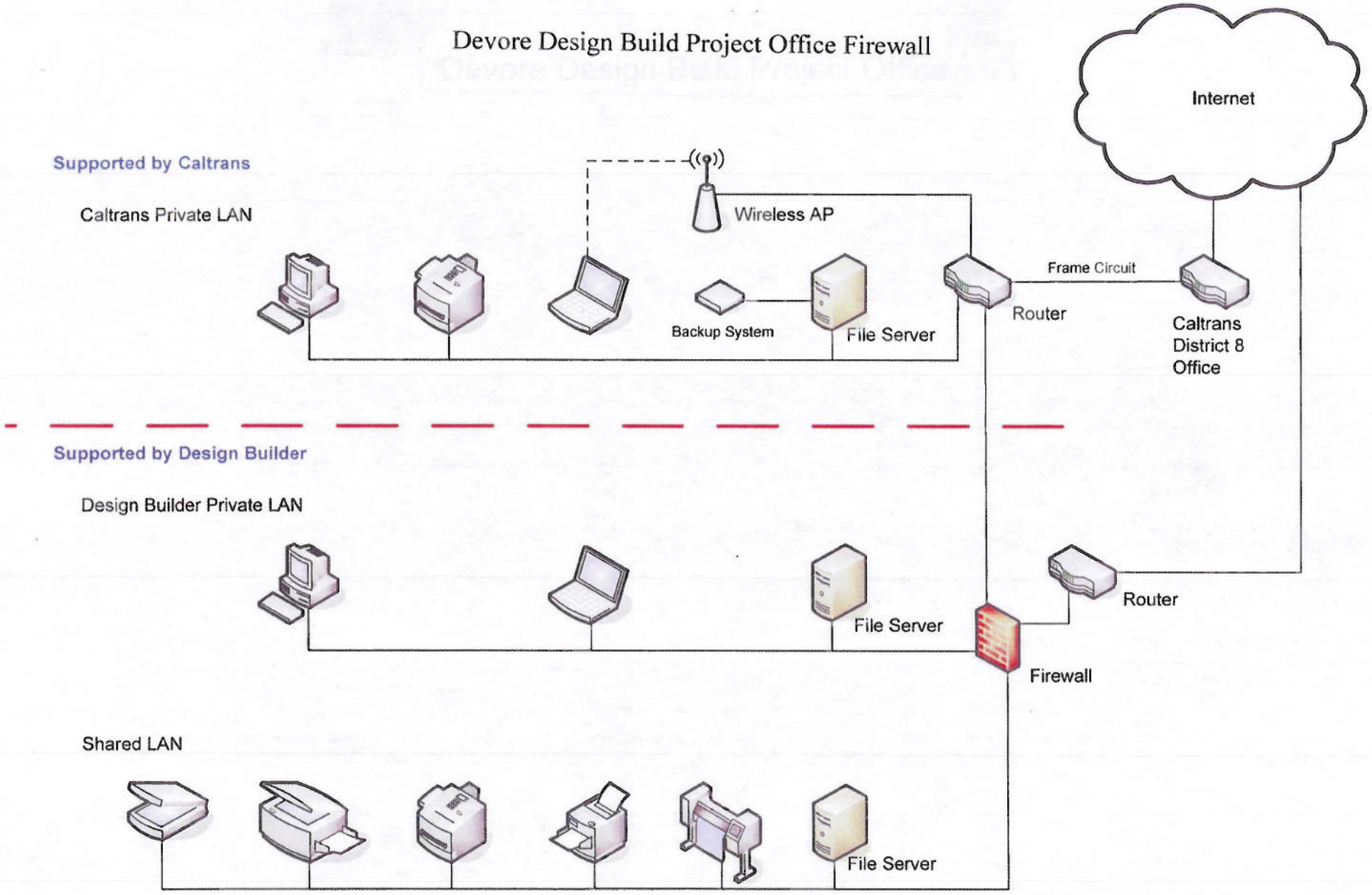
PERSON TO CONTACT ON SITE: _____ **PHONE: ( )** _____

Note: Inspection will only be done at the location where the material is located. All appropriate documents should be readily available for our inspector to verify. Be aware that any other material not listed on the inspection form will not be inspected without prior confirmation. We expect to be able to confirm your inspection date on the next business day following receipt of this form. Please notify this office of all changes to your schedule at least 24 hours prior to the scheduled inspection date. Incomplete or incorrectly filled out forms will delay the inspection process. Be advised that due to the unpredictable nature of inspections, OSM staff will not schedule appointments for a specific time of day. Inspections of material in production may occur at any time. Please remember to provide safe access to all material requiring inspection. A copy of this form can be obtained from Caltrans Structural Material Representative (SMR) for the project.

EXHIBIT 2-H

Devore Design Build Project Office Firewall

EXHIBIT 2-H



June 28, 2011

EXHIBIT 2-I

Release for Construction (RFC) Checklist for R/W and Utilities

EXHIBIT 2-I

Release for Construction (RFC) Checklist for R/W and Utilities

YES	NO	
☐	☐	Are the limits of work identified or shown on RFC Plans (Station and Offsets)?
☐	☐	Have you verified that the Department is in possession of all parcels within the RFC work limits in accordance to the latest monthly Right of Way status report?
☐	☐	Have all utility conflicts been cleared within the RFC work limits? If no, explain how the utility will be protected in place.

_____ _____

Project Manager Quality Manager

Design-Builder Design-Builder

EXHIBIT 4-A

Project Document Environmental Commitment Record

Date: February 2012

ENVIRONMENTAL COMMITMENTS RECORD
(I-15 / I-215 Interchange Improvements Project)

08-SBd-15
PM 14.0 / R16.4

08-SBd-215
PM 16.0 / 17.8

EA 08-0K7100
PN 0800000366

Avoidance, Minimization, and/or Mitigation Measures	Page # in Env. Doc.	Responsible for Development and/or Implementation of Measure	Timing/ Phase	If applicable, corresponding construction provision: (standard, special, non-standard)	Action(s) Taken to Implement Measure	Measure Completed (Date and Initials)		Remarks	Environmental Compliance	
									YES	NO
RESOURCE										
Community Impacts										
REL-1 In conjunction with acquisition of any property, whether for temporary use or a partial or full acquisition for permanent use, all requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended in 1987, and The Business and Farm Relocation Program will be fully satisfied.	2.3-93	Resident Engineer / District Environmental Planning / Design-Builder	During Design-Build							
Utilities and Emergency Services										
UT-1 Prior to the approval of final plans, the impacts of all utility relocations shall be assessed against the impacts identified in the preliminary plans and assessed in this document. If such impacts exceed the impacts assessed in this document, then	2.4-6	District Design-/ Resident Engineer-/ Design-Builder	During Design-Build							

Date: February 2012

ENVIRONMENTAL COMMITMENTS RECORD
(I-15 / I-215 Interchange Improvements Project)

08-SBd-15
PM 14.0 / R16.4

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									YES	NO
the Department shall ensure that additional environmental review of the revised plans is conducted, as necessary. During preparation of final plans, the Department will coordinate requisite utility relocation efforts prior to construction.										
Traffic and Transportation/Bicycle and Pedestrian Facilities										
TR-1 Prior to the commencement of any construction, the design-builder shall prepare a Traffic Management Plan per the Department's requirements, including: a community outreach program, media bulletins, appropriate signing, adherence to dust control restrictions, avoidance of traffic restrictions during peak travel periods, construction zone enhanced enforcement (provided by the California Highway Patrol), emergency response, and	2.5-85	Resident Engineer / District Traffic Management / Design-Builder	During Design-Build							

Date: February 2012

ENVIRONMENTAL COMMITMENTS RECORD
(I-15 / I-215 Interchange Improvements Project)

08-SBd-15
PM 14.0 / R16.4

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									YES	NO
coordination of work as necessary with any other roadway projects in the vicinity. In particular, the TMP shall ensure that emergency responders have adequate access during all phases of construction, and shall provide for emergency contact points between the construction engineer and all emergency responders. The TMP shall also include measures to preserve the viability of I-15 as a heavy haul route during construction to the degree feasible, and will identify measures to coordinate with the heavy haul industry.										
TR-2 The project will not utilize Kenwood Avenue north of the I-15 northbound ramps, or Devore Road north of the I-215 northbound ramps as a detour route during any part of the construction of this project.	2.5-86	Resident Engineer / District Traffic Management / Design-Builder	During Design-Build							

Date: February 2012

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									YES	NO
Additionally, construction haul trucks will be routed away from congested streets and sensitive areas.										
TR-3 The design shall incorporate specific new signage directing motorists to Kenwood Avenue from northbound I-15 and I-215.	2.5-86	District Design / Resident Engineer / District Traffic Management / Design-Builder	During Design-Build							
TR-4 If the project requires the closure of the local service interchanges at Glen Helen Parkway, Devore Road, or Kenwood Avenue for more than ten days, then a ramp closure study must be completed during the design-build phase. The Department will ensure implementation of any measures resulting from such studies.	2.5-86	Resident Engineer / District Traffic Management / District Environmental Planning / Design-Builder	During Design-Build							
Visual/Aesthetics										

Date: February 2012

ENVIRONMENTAL COMMITMENTS RECORD
(I-15 / I-215 Interchange Improvements Project)

08-SBd-15
PM 14.0 / R16.4

08-SBd-215
PM 16.0 / 17.8

EA 08-0K7100
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									YES	NO
V-1 Hardsurface Plan: A plan to implement retaining and sound walls, medians, and other aesthetic hardscape will be incorporated into the final design of the project consistent with the applicable goals and policies articulated in the San Bernardino County and City of San Bernardino General Plans, as well as those in the Glen Helen Specific Plan, including:	2.6-62	District Design / Resident Engineer / Landscape Architecture / Design-Builder	During Design-Build							
V-1-a Sound and retaining walls will be heavily textured (such as fractured rib or split-face) to minimize visual impacts of mass. Surfaces facing public use will incorporate wall cap and panel detailing to scale elements to adjacent features, and site-specific aesthetic features (local or historic references) to minimize community impact by enhancing the regional "sense of place." Sound and retaining walls	2.6-62	Resident Engineer / District Design / Landscape Architecture / Design-Builder	During Design-Build							

Date: February 2012

ENVIRONMENTAL COMMITMENTS RECORD (I-15 / I-215 Interchange Improvements Project)

08-SBd-15
PM 14.0 / R16.4

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PN 0800000366

Avoidance, Minimization, and/or Mitigation Measures	Page # in Env. Doc.	Responsible for Development and/or Implementation of Measure	Timing/ Phase	If applicable, corresponding construction provision: (standard, special, non-standard)	Action(s) Taken to Implement Measure	Measure Completed (Date and Initials)		Remarks	Environmental Compliance	
									YES	NO
in historic/cultural impact areas will include a range of minimization techniques not limited to: set back with planting at road edge, terracing, battered (non-vertical) retaining walls, and coloring to duplicate adjacent native soil.										
V-1-b Slope paving will include textural elements with pattern linking wall treatments to minimize visual impacts of disruption of viewshed elements and link paved elements into existing features.	2.6-62	Resident Engineer / District Design / Landscape Architecture / Design-Builder	During Design-Build							
V-1-c Gore paving will incorporate contrasting paving treatment both as a safety feature and as a minimization measure to reduce visual mass of proposed paving areas.	2.6-62	Resident Engineer / District Design / Landscape Architecture / Design-Builder	During Design-Build							
V-1-d Median barriers, where appropriate and approved by the	2.6-62	Resident Engineer / District Design /	During Design-							

Date: February 2012

ENVIRONMENTAL COMMITMENTS RECORD
(I-15 / I-215 Interchange Improvements Project)

08-SBd-15
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PN 0800000366

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									YES	NO
Department, will incorporate an embossed pattern or "logo" to minimize visual impact of mass hardsurface resulting from median infill and loss of current textural variety of natural earth median. The embossed pattern will not be continuous and will be applied to between 20% and 25% of the new median barriers constructed. Background for the patterned areas will be that of the 75% to 80% of the remaining median barriers constructed.		Landscape Architecture / Design-Builder	Build							
V-2 Highway Planting: All measures necessary to address the potential visual/aesthetic impacts resulting from the I-15/I-215 Interchange Improvements project will be funded and constructed as part of the roadway construction project. Revegetation measures below will address visual/aesthetic impacts and be implemented in a	2.6-62	Resident Engineer / District Design / Landscape Architecture / District Cultural Studies / Design-Builder	During Design-Build							

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									YES	NO
manner that is consistent with constraints and other requirements related to the biological and cultural resources within the project area. Measures will be provided at the following locations:										
V-2-a All graded slopes will be revegetated so that mature (non-pioneer) species cover is established. Planting will be site-specific and vary according to slope aspect and elevation. Temporary irrigation as necessary to establish planting is considered part of this revegetation planting. Revegetation will be required for all disturbed ground as well as graded slopes, to restore visual unity of the site and integrity of the setting.	2.6-63	Resident Engineer / District Design / Landscape Architecture / District Cultural Studies / Design-Builder	During Design-Build							
V-2-b At Devore Road/I-215 and at Kenwood/I-15, planting will	2.6-63	Resident Engineer / District Design /	During Design-							

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									YES	NO
supplement Hardsurface Plan elements and provide appropriate planting at community entries. Planting will minimize visual and community impacts of the increased scale of the adjacent interchange, and provide buffering to retain the existing rural setting. Planting will be site specific and will link to the adjacent native landscape.		Landscape Architecture / District Biologist / District Maintenance / Design-Builder	Build							
V-2-c Along the northbound truck climbing lane, planting will minimize visual impacts of the freeway widening that would occur under the project. Planting will be provided to reduce adjacent owners' awareness of the adjacent interchange.	2.6-63	Resident Engineer / District Design / Landscape Architecture / District Biologist / District Maintenance / Design-Builder	During Design-Build							
V-2-d Areas adjacent to bridge and wall elements will be planted to minimize the increased scale of built elements. Native tree massing, appropriate to each	2.6-63	Resident Engineer / District Design / Landscape Architecture / District Biologist / District	During Design-Build							

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									YES	NO
specific location, will be implemented utilizing temporary irrigation, to minimize local visual impacts.		Maintenance / Design-Builder								
V-2-e Storm water elements (i.e., swales, basins) will be addressed as integrated elements of the revegetation planting. As approved by the Department, rip-rap and other constructed elements will be colored to match native soil to minimize visual intrusion. Grading of basins will minimize their visual impacts by being designed to present a "not man-made appearance," mimicking natural land forms.	2.6-63	Resident Engineer / District Design / Landscape Architecture / District Biologist / District Stormwater / District Maintenance / Design-Builder	During Design-Build							
V-3 Light and Glare: Lighting fixtures will be selected to minimize glare on adjacent properties and into the night sky. Lighting will be shielded with non-glare hoods and focused within the freeway right-of-way. The	2.6-63	Resident Engineer / District Design / Landscape Architecture / District Biologist / District Maintenance /	During Design-Build							

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									YES	NO
lighting plan will be reviewed and approved by the Department and the County and the City of San Bernardino, as applicable, prior to construction to ensure compliance with these criteria. Increased glare from proposed walls, structures and pavements will be minimized by measures identified in V-1 and V-2.		Design-Builder								
V-4 Grading: Slopes, particularly those abutting undisturbed areas, will include contour grading, easing all edges and slope rounding (Department's Highway Design Manual 304.4 and 109.3), and where necessary, additional right-of-way to achieve it. Contour grading and slope rounding will be provided to minimize the visual impacts of disrupted graded slopes against existing landforms and to address impacts to unity between native surroundings and graded	2.6-64	Resident Engineer / District Design / Landscape Architecture / District Biologist / Design-Builder	During Design-Build							

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									YES	NO
areas.										
V-5 Structures: Architectural/ aesthetic treatment of bridges will address the I-15/I-215 Interchange as a unique and vivid visual asset. Structures will include shape and textural elements as appropriate to link them to adjacent Hardsurface Plan elements. Girders and barriers will incorporate similar unifying treatments. Support for lighting and signage will incorporate linking elements of the base or the pole itself to the overall structure. These treatments will address the visual impacts of the proposed structures by integrating its elements into a visually unified structure linked into surrounding ground treatments.	2.6-64	Resident Engineer / District Design / Landscape Architecture / District Cultural Studies / Design-Builder	During Design-Build							
Cultural Resources										

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									YES	NO
CR-1 If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.	2.7-5	Resident Engineer / District Cultural Studies / Design-Builder	During Design-Build							
CR-2 If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to Public Resources Code Section 5097.98, if the remains are thought to be Native American, the coroner will notify the Native American Heritage Commission (NAHC) who will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will	2.7-6	Resident Engineer / District Cultural Studies / Design-Builder	During Design-Build							

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									YES	NO
contact the District 8, Division of Environmental Planning, Gabrielle Duff, DEBC: (909) 383-6933, and Gary Jones, DNAC: (909) 383-7505, so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.										
CR-3 Archaeological and tribal monitors shall be present during grubbing and clearing activity in the areas surveyed in the Supplemental HPSR. In the event that additional cultural deposits are uncovered during grubbing and clearing operations, the archaeological monitor shall be empowered to halt or divert work in the vicinity of the find until the archaeologist is able to determine the nature and the	2.7-6	Resident Engineer / District Cultural Studies / Design-Builder	During Design-Build							

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									YES	NO
significance of the discovery.										
Hydrology and Floodplain										
FP-1 During design-build, all applicable coordination with San Bernardino County Department of Public Works Flood Control Division shall occur including obtaining an encroachment permit as required prior to work within their right-of-way.	2.8-8	Resident Engineer / District Design / District Hydraulics / Design-Builder	During Design-Build							
FP-2 During design-build, the agency shall ensure that the project engineer prepares a Final Location Hydraulic Study (LHS) based on an updated hydraulic model for Cable Creek. In addition, a detailed survey of the existing creek will be performed to determine actual as-built conditions. The results of the survey will be incorporated into an updated hydraulic model for both existing and proposed	2.8-8	Resident Engineer / District Design / District Hydraulics / Design-Builder	During Design-Build					The above measure only applied to Alternatives 2 and 5 because Alternative 3A was selected as the Preferred Alternative, this measure is no longer applicable to the project.		

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									YES	NO
conditions.										
Water Quality and Storm Runoff										
WQ-1 The Department will comply with the provisions of the National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the Department's Order No. 99-06-DWQ, NPDES No. CAS000003, and any subsequent permit as they relate to construction activities for the project. This will include submission of a Notice of Intent (NOI) to the State Water Resources Control Board at least 14 days prior to the start of construction which includes preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP), and submission of a Notice of Termination (NOT) to the State	2.9-20	Resident Engineer / District Design / District Storm Water / Design-Builder	During Design-Build							

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Water Resources Control Board upon completion of construction and stabilization of the site.										

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									YES	NO
WQ-2 The Department will comply with the provisions of the General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (De Minimus) Threat to Water Quality, Order No. R8-2009-0003, National Pollutant Discharge Elimination System (NPDES) No. CAG998001, as they relate to discharge of uncontaminated non-storm water dewatering wastes discharges for the project. This will include submitting to the Santa Ana Regional Water Quality Control Board a Notice of Intent (NOI) at least 60 days prior to the start of construction, notification of discharge at least 5 days prior to any planned discharges, and monitoring reports by the 30th day of each month following the monitoring period.	2.9-20	Resident Engineer / District Design / District Storm Water / Design-Builder	During Design-Build							
WQ-3 The Department will comply with the Statewide Storm	2.9-20	Resident Engineer / District Design /	During Design-							

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									YES	NO
Water Management Plan (SWMP, May 2003, or subsequent issuance) and the National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the Construction General Permit (CGP) 2009 0009-DWQ, NPDES No. CA000002, and the NPDES Permit and Waste Discharge Requirements for the San Bernardino County Flood Control District, the County of San Bernardino, and the Incorporated Cities of San Bernardino County within the Santa Ana Region, Order No. R8-2010-0036 (NPDES No. CAS618036), and any subsequent permit as required and as they relate to operation of the project.		District Stormwater / Design-Builder	Build							
WQ-4 The potential exists for contaminated groundwater in the project area due to past leaks	2.9-21	Resident Engineer / District Design / District Stormwater /	During Design-Build							

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									YES	NO
and spills in the vicinity. In the unexpected event that dewatering of contaminated groundwater occurs, compliance with the General Permit for de minimus water discharges or an individual permit from the SARWQCB, consistent with NPDES requirements, shall be required. Once the SARWQCB receives and reviews the NOI, the SARWQCB will decide which permit is applicable.		District Environmental Engineering / Design-Builder								
Geology/Soils/Seismic/Topography										
G-1 During the design phase of the project, numerous exploratory borings will be excavated throughout the project area to investigate site-specific soils and conditions and to collect samples of subsurface soils for laboratory testing. The locations and depths of the borings will be selected based upon the final design selected. Either a truck-mounted	2.10-10	Resident Engineer / District Design / District Environmental Engineering / Design-Builder	During Design-Build							

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									YES	NO
drilling rig equipped with hollow-stem augers or a mud-rotary drilling rig shall be used to excavate the exploratory boreholes. Soil samples recovered shall be tested to determine soil type, soil shear strength, compressibility characteristics, Sand Equivalent, R-value, compaction characteristics, permeability and erosion, and corrosion potential.										
G-2 During the design phase, settlement magnitudes and time rates of settlement shall be verified by exploratory borings, laboratory soil testing, and analysis.	2.10-11	Resident Engineer / District Design / District Environmental Engineering / Design-Builder	During Design-Build							
G-3 In order to minimize the potential for surface soil erosion, selective grading and adhering to provisions for site drainage, slope planting, and any other measures required by the Department will	2.10-11	Resident Engineer / District Design / District Environmental Engineering /	During Design-Build							

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									YES	NO
be incorporated into the design.		Design-Builder								
Paleontology										
P-1 A qualified paleontologist or his/her representative will attend the pre-grade meeting. At this meeting, the paleontologist will explain the likelihood for encountering paleontological resources, what resources may be discovered, and the methods that will be employed if anything is discovered.	2.11-3	Resident Engineer / District Paleontology / Design-Builder	During Design-Build							
P-2 During construction excavation, a qualified vertebrate paleontologic monitor shall initially be present on a full-time basis whenever excavation will occur within the sediments that have a high sensitivity rating and on a spot-check basis in sediments that have a low sensitivity rating. Monitoring may be reduced to a part-time basis if	2.11-3	Resident Engineer / District Paleontology / Design-Builder	During Design-Build							

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									YES	NO
no resources are being discovered in sediments with a high sensitivity rating (monitoring reductions and when they occur will be determined by the qualified Principal Paleontologist). The monitor shall inspect fresh cuts and/or spoils piles to recover paleontological resources. The monitor shall be empowered to temporarily divert construction equipment away from the immediate area of the discovery. The monitor shall be equipped to rapidly stabilize and remove fossils rapidly to avoid prolonged delays to construction schedules. If large mammal fossils or large concentrations of fossils are encountered, the grading contractor shall consider using heavy equipment on site to assist in the removal and collection of large materials.										

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									YES	NO
P-3 Localized concentrations of small (or micro-) vertebrates may be found in all native sediments. Therefore, it is recommended that these native sediments occasionally be spot-screened through 1/8- to 1/20-inch mesh screens to determine whether microfossils are present. If microfossils are encountered, additional sediment samples (up to 3 cubic yards, or 6,000 pounds) shall be collected and processed through 1/20-inch mesh, and sometimes 1/30-inch mesh screens, to recover additional fossils. The processing of large bulk samples is best accomplished at a designated location within the project limits that will be accessible throughout the duration of construction but will also be away from any proposed cut or fill areas. Processing is usually completed concurrently with construction,	2.11-3	Resident Engineer / District Paleontology / Design-Builder	During Design-Build							

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									YES	NO
with the intent to have all processing completed before, or just after, project completion. A small corner of a staging or equipment parking area is an ideal location. If water is not available, the location should be accessible for a water truck to occasionally fill containers with water.										
P-4 Any recovered specimens shall be prepared to the point of identification and permanent preservation. This includes the picking of any washed mass samples to recover small invertebrate and vertebrate fossils, the removal of surplus sediment from around larger specimens to reduce the volume of storage for the repository and the storage cost, and the addition of approved chemical hardeners/stabilizers to fragile specimens. This is best	2.11-4	Resident Engineer / District Paleontology / Design-Builder	During Design-Build							

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									YES	NO
accomplished at a designated laboratory, usually off site, with access to fossil preparation tools, magnifying equipment, storage boxes and vials, and chemical hardeners. Processing of fossils through the lab is best accomplished concurrently with construction, especially if numerous fossils are being collected.										
P-5 Specimens shall be identified to the lowest taxonomic level possible and curated into an institutional repository with retrievable storage. The repository institutions usually charge a one-time fee based on volume, so removing surplus sediment is important. The repository institution may be a local museum or university that has a curator who can retrieve the specimens on request. The draft curation agreement	2.11-4	Resident Engineer / District Paleontology / Design-Builder	During Design-Build							

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									YES	NO
between the landowner and the curation facility should be in place with an approved curation facility prior to the initiation of any paleontological monitoring or mitigation activities.										
P-6 A report of findings will be prepared at the conclusion of the project discussing what was found and the significance of the finds.	2.11-4	Resident Engineer / District Paleontology / Design-Builder	During Design-Build							
Hazardous Waste/Materials										
HW-1 Dewatering is not anticipated during the construction of the project. However, in the event dewatering may be required, a Site Investigation for potentially contaminated groundwater will be required during the preparation of final plans within the area of the project ROW.	2.12-14	Resident Engineer / District Design / District Storm Water / District Biologist / Design-Builder	During Design-Build							

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									YES	NO
HW-2 Additional ADL sampling will occur in unpaved locations outside the existing State highway ROW during the preparation of final plans, when the adjacent properties will be acquired as part of the project. The analytical results of the soil sampling will determine the appropriate handling of the soil and disposal of surplus materials. When feasible, soil will be reused within Department ROW in accordance with CalEPA DTSC Variance No. V09HQSCD006 (effective July 1, 2009 through July 1, 2014) for ADL impacted soil, or a subsequent variance. If it is not feasible to reuse soils, then the excavated hazardous soils will require off-site disposal as hazardous waste at a permitted facility. Refer to Caltrans Special Standard Provision (SSP) XE 19-900 for additional information regarding	2.12-14	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							

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									YES	NO
the disposal of soils impacted with ADL. The following additional measures will be undertaken to minimize the potential for adverse impacts from aerially deposited lead.										
HW-2-a A site-specific lead compliance plan should be developed to address health and safety of construction workers**.**	2-12.14	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
HW-2-b In consideration of total lead concentrations, existing soil within the state right-of-way may be managed as non-hazardous and may be reused onsite without restriction or released as surplus to the design-builder for disposition as non-hazardous waste.	2-12.14	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							

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									YES	NO
HW-2-c However, it should be stipulated that the soil is contaminated with lead and should not be reused at residential or other sensitive receptor locations (i.e. schools, day care. etc.).	2-12.14	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
HW-3 Prior to the start of construction, a site-specific Health and Safety Plan will be prepared, consistent with Department requirements, to address contact, handling, and disposal of potentially contaminated groundwater and soil. The Plan shall include the following:	2.12-15	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
HW-3-a Identification of key personnel	2.12-15	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							

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									YES	NO
HW-3-b Monitoring of potential vapors resulting from contaminated soil or groundwater, utilizing a photo-ionization detector	2.12-15	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
HW-3-c Summary of risk assessment for workers, the community, and the environment	2.12-15	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
HW-3-d Air Monitoring Plan	2.12-15	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
HW-3-e Emergency Response Plan	2.12-15	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
HW-4 Prior to the completion of Environmental Document and Project Approval phase, but after a build alternative is selected, a certified consultant shall conduct	2.12-15	Resident Engineer / District Environmental Engineering /	Prior to PA&ED					This has been completed.		

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									YES	NO
asbestos surveys of any roadway structures within the State highway ROW that will be renovated or demolished.		Design-Builder								
HW-5 During the preparation of final plans, prior to the start of any demolition or renovation of a structure, a certified consultant shall conduct asbestos, lead-based paint (LBP), and polychlorinated biphenyls (PCBs) surveys of any building structures that will be renovated or demolished.	2.12-15	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
HW-6 During the preparation of final plans, prior to the start of any demolition or renovation, and/or relocation of a structure, all utility pole-mounted transformers within the project area shall be inspected for leaks. Leaking transformers will be considered a potential PCB hazard unless tested and shall be	2.12-15	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							

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									YES	NO
handled accordingly.										
HW-7 Prior to construction, any yellow traffic striping and pavement-marking material will be tested and removed in accordance with Caltrans SSP 14-001.	2.12-15	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
HW-8 Soils adjacent to the BNSF railroad tracks were tested and it was determined that the contamination of such soils is consistent with background levels. However, any excess soil from the railroad right-of-way should not be used on residential or other sensitive use (i.e.; day care) properties.	2.12-15	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
HW-9 Soil sampling for pesticides on former agricultural properties that will be acquired as part of the project has been conducted where soil has not been disturbed (through grading,	2.12-16	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							

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									YES	NO
etc.). The analytical results of the soil sampling indicate that the soils can be safely reused on the project site. However, any soil considered for off-site re-use or disposal should be stockpiled, sampled and analyzed, at a minimum, for TPH (carbon chain), VOCs, and metals to assure that the soil is suitable for its intended reuse.										
HW-10 Prior to the start of any demolition or renovation of a structure, notification and submittal of fees to the SCAQMD at least 10 days prior to proceeding with the demolition work (refer to SCAQMD Rule 1403) shall be required. Notification would fall under Section 7-1.01F, Air Pollution Control, and Section 7-1.04, Permits and Licenses, of the Standard Specifications. The design-builder shall adhere to the	2.12-16	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							

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									YES	NO
requirements of SCAQMD Rule 1403 during renovation/ demolition activities.										
HW-11 Unless documentation from the utility company indicates that creosote was not used, all wooden utility poles that are to be removed or relocated as part of the project, as well as soils located at the base of these utility poles, will be tested for creosote during the preparation of final plans when access is available. If creosote is detected within samples taken from either the utility poles or soils beneath the utility poles, such material shall be disposed of at the appropriate classified waste facility.	2.12-16	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
HW-12 If unknown wastes or suspect materials are discovered during construction, all excavation activities in the	2.12-16	Resident Engineer / District Environmental Engineering /	During Design-Build							

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									YES	NO
immediate vicinity of the area of concern shall be suspended. The contractor will follow the Department Unknown Hazards Procedures outlined in Section 7-1.06 of the Environmental Hazards and Safety Procedures of the Department's Construction Manual.[1] The Department, in conjunction with other appropriate agencies, shall develop a plan to investigate suspect materials and determine what corrective measures, if any, may be required to safeguard public health and the environment.		Design-Builder								
HW-13 Prior to renovation or demolition activities, a licensed asbestos abatement firm shall be	2.12-16	Resident Engineer / District Environmental	During Design-Build							

[1] http://www.dot.ca.gov/hq/construc/manual2001/chapter7/chp7_1.pdf

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									YES	NO
contracted to remove the identified ACM shim and bolt mastic materials. The identified reasonably available control measures (RACMs) will require removal in compliance with the USEPA NESHAP and the local South Coast Air Quality Management District (SCAQMD) Rule 1403.		Engineering / Design-Builder								
HW-14 The asbestos abatement contractor shall comply with Rule 1403 and provide at least a 10-day notification prior to asbestos removal.	2.12-17	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
HW-15 Prior to the importation of any fill material, the design-builder shall ensure that all imported fill is sampled and is free of contamination.	2.12-17	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
HW-16 It is recommended that additional investigation be conducted at the closed service	2.12-17	Resident Engineer / District Environmental	During Design-Build							

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									YES	NO
station site located on Devore Road north of I-215 to identify the anomaly using a backhoe. If necessary, the structure should be removed or abandoned in place in accordance with regulatory requirements. Additional sampling and laboratory analysis may be required below the structure if it is a UST or other potential source of chemical release. Given the history of the Site, undiscovered or unknown environmental conditions may be encountered during grading and development of the project. If encountered, additional investigations and removal actions may be required at that time. Although no evidence of chemical impact was identified during the PSI, the contractor		Engineering / Design-Builder								

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									YES	NO
should be prepared to handle soils impacted by former site operations, should they be encountered during construction. All excavation activities should be performed by a grading contractor possessing an active various locations South Coast Air Quality Management District (SCAQMD) Rule 1166 excavation permit. During construction, stained or odorous soil, if encountered, may be stockpiled for characterization on a portion of the Department's property outside the construction zone. This soil should be placed inside bermed, plastic-lined staging areas and covered with plastic when not in active use. If encountered, impacted soils should be managed by the contractor in accordance with regulations.										

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									YES	NO
Air Quality										
AQ-1 During the design-build phase, the following standard conditions shall be implemented:	2.13-30	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
AQ-1-a Prior to any site preparation, grading and/or construction activities, the Project Engineer will require the design-builder to develop a Construction Emission Minimization Plan (CEM Plan). That plan will specifically incorporate measures for controlling particulate and other emissions during construction from the following sources: • Department's Standard Specifications Sections 14-9 and 18 (Rule Applicability and Dust Control) • Department's Standard	2.13-30	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							

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									YES	NO
Specifications Section 39-3.06 (Asphalt Concrete Plant Emissions) • Department's Standard Specifications Section 13(Stormwater measures related to dust control) • SCAQMD Rule 403, including control measures from Tables 1, 2, and 3 in that rule • ARB Off-Road Fleet and Portable Equipment regulations, and SCAQMD permitting requirements, as applicable under Standard Specifications 14-9										
AQ-1-b During all site preparation, grading, clean-up, and other activities during construction, the Resident Engineer will require the design-builder to comply with the measures in the CEM Plan.	2.13-30	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
AQ-1-c The Resident Engineer will conduct site inspections at	2.13-30	Resident Engineer / District Environmental	During Design-							

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									YES	NO
least once a month to ensure that the design-builder is complying with the provisions of the CEM Plan.		Engineering / Design-Builder	Build							
AQ-2 During clearing, grading, earth moving, or excavation operations, excessive fugitive dust emissions will be controlled by regular watering and/or other dust preventive measures identified in the SCAQMD Rule 403 BACMs, as listed in Table 2-13-H in Section 2.13.3 of Chapter 2 of this Environmental Document. These control techniques will be indicated in project specifications. Compliance with the Rule 403 BACMs will be subject to periodic site inspections by the Department. Measures will include:	2.13-30	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
AQ-2-a All material excavated or graded will be sufficiently	2.13-31	Resident Engineer / District Environmental	During Design-							

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									YES	NO
watered to prevent excessive amounts of dust.		Engineering / Design-Builder	Build							
AQ-2-b Watering will occur at least three times daily with complete coverage, including mandatory watering after work is done for the day, with additional watering if necessary to adequately control dust.	2.13-31	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
AQ-2-c All material transported on site or off site will be either sufficiently watered or securely covered to prevent excessive amounts of dust.	2.13-31	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
AQ-2-d The area disturbed by clearing, grading, earth moving, or excavation operations will be minimized so as to prevent excessive amounts of dust.	2.13-31	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
AQ-2-e Visible dust beyond the property line emanating from the	2.13-31	Resident Engineer / District Environmental	During Design-							

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									YES	NO
project will be prevented to the maximum extent feasible, consistent with applicable Department standard specifications.		Engineering / Design-Builder	Build							
The CEM Plan will also include the following measures to reduce PM_{10}: **AQ-2-f** Apply non-toxic soil stabilizers according to manufacturers' specifications to all inactive construction areas, (previously graded areas inactive for ten days or more), all unpaved parking or staging areas, or unpaved road surfaces.	2.13-31	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
AQ-2-g Sweep streets at the end of the day if visible soil is carried onto adjacent public roads (recommend water sweepers with reclaimed water). Sweepers must comply with SCAQMD	2.13-31	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							

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									YES	NO
Rules 1186 and 1186.1.										
AQ-2-h Control of material on all trucks hauling excavated or graded material from the site by compliance with State Vehicle Code Section 23114, with special attention to Sections 23114(b)(F), (e)(2), and (e)(4) as amended, regarding the prevention of such material spilling onto public streets and roads.	2.13-31	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
AQ-2-i Temporarily cover stockpiles and make additional stabilizer/water applications when sustained wind speeds, or gusts, exceed 25 mph**.**	2.13-31	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
AQ-3 Equipment staging or storage areas shall be located at least 500 feet away from any occupied residence, school, hospital, licensed child care facility, or other licensed health care facility throughout the period	2.13-32	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							

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									YES	NO
of construction.										
AQ-4 The CEM Plan will also include the following measures to reduce vehicular emissions:	2.13-32	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
AQ-4-a Instruct the design-builder to minimize truck idling to the maximum extent feasible, and to comply at minimum with ARB on- and off-road vehicle regulations (maximum 5 minutes of idling unless meeting one of the rules' exemptions).	2.13-32	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
AQ-4-b Use electricity from power poles rather than temporary diesel or gasoline power generators, to the maximum extent feasible.	2.13-32	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
AQ-4-c As part of the Construction Traffic Management Plan, route haul trucks away from	2.13-32	Resident Engineer / District Environmental	During Design-Build							

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									YES	NO
congested streets or sensitive areas* to the maximum extent feasible. * Sensitive areas are those with occupied residences, schools, hospitals, child care facilities, or other health care facilities, and active-use parks such as playgrounds, consistent with the ARB Land Use Handbook.		Engineering / Design-Builder								
AQ-4-d Control of ozone precursor emissions from construction equipment vehicles by maintaining equipment engines in good condition and in proper tune per the manufacturer's specifications.	2.13-32	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
AQ-4-e Ozone precursor emissions from construction equipment vehicles will be controlled by maintaining equipment engines in good condition and in proper tune per	2.13-32	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							

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									YES	NO
manufacturer's specifications. Compliance with this measure will be subject to periodic inspections of construction equipment vehicles by the Department.										
AQ-5 All Diesel fueled construction equipment, whether stationary or mobile, will comply with the latest applicable regulations promulgated by the California Air Resources Board (CARB).	2.13-32	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
Noise										
N-1 The control of noise from construction activities shall conform to the Department's Standard Specifications in Section 14-8.02, "Noise Control," and also by Standard Special Provisions S5-310, "Noise Control." Noise control shall conform to the provisions in	2.14-17	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							

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									YES	NO
Section 14-8.02 and the Standard Special Provision in S5-310. The noise level from the Contractor's operations, between the hours of 9:00 p.m. and 6:00 a.m., shall not exceed 86 dBA L_{max} at a distance of 50 ft. The Contractor should use an alternative warning method instead of a sound signal unless required by safety laws. In addition, the Contractor shall equip all internal combustion engines with the manufacturer-recommended muffler and shall not operate any internal combustion engine on the job site without its appropriate muffler.										
N-2 In accordance with the County of San Bernardino County Code, construction activities shall be limited to between the hours of 7:00 a.m. and 7:00 p.m., Monday through Saturday, excluding Sundays and	2.14-18	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							

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									YES	NO
Federal holidays.										
N-3 Portable equipment should be located as far as possible from the noise-sensitive locations as is feasible.	2.14-18	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
N-4 Construction vehicle staging areas and equipment maintenance areas should be located as far as possible from sensitive receiver locations.	2.14-18	Resident Engineer / District Environmental Engineering / Design-Builder	During Design-Build							
N-5 Prior to completion of the Environmental Document and Project Approval, the sound barriers determined to be reasonable and feasible shall be coordinated with the affected property owners.	2.14-41	Resident Engineer / District Environmental Engineering / Design-Builder	Prior to PA&ED					No sound barriers are considered reasonable and feasible for the Preferred Alternative; therefore, this measure is no longer applicable.		
N-6 Feasible sound barriers that are not reasonable based on a cost perspective or interior noise abatement measures, such as	2.14-41	Resident Engineer / District Environmental Engineering /	During Design-Build					Similarly, sound barriers Nos. 2, 14, and 32, under their respective alternatives,		

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									YES	NO
window and door upgrades, should be considered for Receiver R-6 because this receiver would be exposed to a severe traffic noise impact of 75 dBA L_{eq} or higher under all four build alternatives. Sound barrier 24 for Alternative 3A, the Preferred Alternative, is feasible, but not reasonable.		Design-Builder						are also feasible but not reasonable, however, since they do not pertain to Alternative 3A, they are now removed from reference in this measure.		
BIOLOGICAL RESOURCES										
Natural Communities										
NC-1 The final project design will not exceed the grading limits identified in the preliminary project plans without additional environmental assessment.	2.15-19	Resident Engineer / District Design / District Biologist / District Environmental Planning / Design-Builder	During Design-Build							
NC-2 Appropriate wildlife fencing will be installed to direct wildlife toward existing undercrossing	2.15-19	Resident Engineer / District Design /	During Design-Build							

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									YES	NO
structures and to inhibit wildlife movement onto the I-15 and I-215 freeways, as determined by the District Biologist. Equipment maintenance, lighting, and staging must be in designated areas, away from wildlife corridor entrances. The corridors will be kept clear of all equipment or structures that could potentially serve as barriers to wildlife passage.		District Biologist / Design-Builder								
NC-3 Construction staging and storage activities will be located in upland areas so as to prevent the runoff from any spills from entering waters of the U.S. and State.	2.15-20	Resident Engineer / District Design / District Biologist / Design-Builder	During Design-Build							
NC-4 In order to avoid impacts to nesting birds, any native vegetation removal or tree trimming activities will occur outside of the nesting bird season (February 15–August 31). In the event that vegetation	2.15-20	Resident Engineer / District Biologist / Design-Builder	During Design-Build							

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									YES	NO
clearing is necessary during the nesting season, a qualified biologist must conduct a pre-construction survey to identify the locations of nests. Should nesting birds be found, an exclusionary buffer will be established by the biologist. This buffer will be clearly marked in the field by construction personnel under guidance of the biologist, and construction or clearing will not be conducted within this zone until the biologist determines that the young have fledged or the nest is no longer active.										
NC-5 A biologist will monitor construction for the duration of the project to ensure that vegetation removal, BMPs, ESAs, and all avoidance and minimization measures are properly constructed and followed.	2.15-20	Resident Engineer / District Design / District Biologist / Design-Builder	During Design-Build							
NC-6 The existing culvert structures that will be extended	2.15-20	Resident Engineer / District Design /	During Design-							

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									YES	NO
or modified by the project will be designed to be at least as compatible with wildlife usage as the existing culverts. For example, to create traction for wildlife, textured concrete will be used within the culvert and on culvert inlet/outlet structures. Existing culverts will be day-lighted or sky-lighted to enhance wildlife visibility, as determined to be feasible by the Department Project Manager. Vegetation will be removed from culvert areas with hydrological flow. However, because vegetation around culverts provides cover for animals, routine maintenance of culverts will involve clearing vegetation mainly in the flow line so use by wildlife is not inhibited. The following avoidance and minimization measures will be incorporated:		District Biologist / District Maintenance / Design-Builder	Build							
NC-6-a Following project construction, all disturbed habitat	2.15-20	Resident Engineer / District Design /	During Design-							

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									YES	NO
adjacent to 1a-Pittman Canyon (Matthews Ranch Road) and 1b-Pittman Canyon (culvert), 2-Middleman Canyon, 8-Cajon Creek, and 9-BNSF and UP Railroad will be restored with native vegetation to the best extent feasible.		District Biologist / Design-Builder	Build							
NC-6-b Equipment maintenance, lighting, and staging must be in designated areas, away from wildlife crossings.	2.15-20	Resident Engineer / District Design / District Biologist / Design-Builder	During Design-Build							
NC-6-c If work must be done at night, noise and direct lighting would be directed away from the crossings.	2.15-21	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
NC-6-d The crossings would be kept clear of all equipment or structures that could potentially serve as barriers to wildlife passage.	2.15-21	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
NC-6-e The existing culvert structures that would be	2-15-21	Resident Engineer / District Design /	During Design-							

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									YES	NO
extended or modified by the project would be designed so that they would be at least as compatible with wildlife usage as the existing culvert. Where feasible, the final design will incorporate the use of textured concrete within the culvert, and on culvert inlet/outlet structures**.**		District Biologist / Design-Builder	Build							
NC-6-f To maximize wildlife movement in each of the culverts identified in Table 2.15-C, any culverts listed in the table shall include natural or smooth cement bottoms in the extended segments.	2.15-21	Resident Engineer / District Design / District Biologist / Design-Builder	During Design-Build							
NC-6-g Wing-walls will be utilized to the maximum extent practicable to minimize culvert extension lengths for each of the culverts identified in Table 2.15-C.	2.15-21	Resident Engineer / District Design / District Biologist / Design-Builder	During Design-Build							
NC-6-h During the final design stage, each of the major wildlife crossings shown in Table 2.15-C will be evaluated to determine the	2.15-21	Resident Engineer / District Design / District Biologist /	During Design-Build							

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									YES	NO
feasibility of day-lighting any portions of the culvert or adding sky-lights, where feasible, to enhance wildlife movement.		Design-Builder								
NC-6-i Appropriate wildlife fencing will be installed to direct wildlife toward existing undercrossing structures, as determined by the District Biologist, to inhibit wildlife movement onto the I-15 and I 215.	2.15-21	Resident Engineer / District Design / District Biologist / Design-Builder	During Design-Build							
NC-6-j Vegetation will be removed from the flow line. However, because it is best to have vegetation around the culverts to provide cover for animals, the Department will provide routine maintenance of culverts by clearing vegetation in the flow line with minimal impact to wildlife, so use by wildlife is not inhibited.	2.15-21	Resident Engineer / District Biologist / District Maintenance / Design-Builder	During Design-Build							
NC-6-k Prior to clearing or construction, highly visible barriers (such as orange	2.15-21	Resident Engineer / District Biologist /	Prior to any ground disturbing activities							

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									YES	NO
construction fencing) will be installed around the project footprint to designate ESAs to be preserved. No grading or fill activity of any type will be permitted within these ESAs. In addition, heavy equipment, including motor vehicles, will not be allowed to operate within the ESAs. All construction equipment should be operated in a manner so as to prevent accidental damage to nearby preserved areas. No structure of any kind, or incidental storage of equipment or supplies, will be allowed within these protected zones. Silt fence barriers will be installed at the ESA boundary to prevent accidental deposition of fill material in areas where vegetation is immediately adjacent to planned grading activities.		Design-Builder								
NC-7 Noise sampling will be conducted before and after	2.15-22	Resident Engineer / District Biologist /	During Design-							

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									YES	NO
construction in Pittman Canyon in 3-5 locations as directed by the District biologist in the upstream drainage to provide data related to the wildlife enhancement measures.		District Design / Design-Builder	Build							
NC-8 A minimum 5' passage (sidewalk or trail) will be incorporated adjacent to the newly constructed Cajon Road under the I-15 Bridge to allow wildlife movement in the area when the Creek is filled with water in normal storm conditions.	2.15-22	Resident Engineer / District Design / District Biologist / Design-Builder	During Design-Build							
NC-9 Rubberized asphalt will be used on Cajon Road in the area adjacent to Cajon Creek as it traverses under the I-15 Bridge to reduce noise.	2.15-22	Resident Engineer / District Design / District Biologist / Design-Builder	During Design-Build							
NC-10 No lighting will be installed on Cajon Boulevard between 100 feet west of Devore Road/Glen Helen Parkway and 100 feet east of the Kenwood Avenue intersection. Any lighting at the Kenwood Avenue intersection	2.15-22	Resident Engineer / District Design / District Biologist / Design-Builder	During Design-Build							

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									YES	NO
shall be limited to requisite safety lighting only.										
NC-11 No lighting will be installed on the I-15 bridges over Cajon Creek that will shine down below the bridges.	2.15-22	Resident Engineer / District Design / District Biologist / Design-Builder	During Design-Build							
NC-12 The Pittman Canyon culvert downstream (south and west of I-15) will be reconstructed utilizing 3:1 – 4:1 side slopes within the Department's right-of-way, and will include a stepped transition down to the drainage from the culvert.	2.15-22	Resident Engineer / District Design / District Biologist / Design-Builder	During Design-Build							
NC-13 The District will work with USFS to identify wildlife enhancement measures in the Pittman Canyon area and Unnamed Drainage 4 prior to construction.	2.15-22	Resident Engineer / District Design / District Biologist / District Environmental Planning / Design-Builder	During Design-Build							
NC-14 During construction, soil and vegetation disturbance will	2.15-22	Resident Engineer / District Design /	During Design-							

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									YES	NO
be minimized to the greatest extent feasible.		District Biologist / District Environmental Planning / Design-Builder	Build							
Wetlands and Waters										
WAT-1 Implementation of any of the Build Alternatives will require obtaining the following permits related to Waters of the U.S. and Waters of the State:	2.16-40	Resident Engineer / District Biologist	Prior to Construction							
WAT-1-a Section 404 Permit from the USACOE	2.16-40	Resident Engineer / District Biologist	Prior to Construction							
WAT-1-b Section 401 Waiver of Certification of the Section 404 Permit from the RWQCB	2.16-40	Resident Engineer / District Biologist	Prior to Construction							
WAT-1-c Section 1602 Agreement from the CDFG	2.16-40	Resident Engineer / District Biologist	Prior to Construction							
WAT-2 Compensatory mitigation is anticipated to be required to offset the loss of federal jurisdictional waters and will be at a minimum 2:1 mitigation ratio. Of the 76 acres being purchased for impacts to alluvial fan sage scrub, the Department plans to utilize 3.5 acres of the 76 to	2.16-40	Resident Engineer / District Biologist / Design-Builder	During Design-Build							

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									YES	NO
address impacts to waters of the U.S.										
WAT-3 Compensatory mitigation is anticipated to be required to offset the loss of State jurisdictional waters and will be at a minimum 2:1 mitigation ratio. Of the 76 acres being purchased for impacts to alluvial fan sage scrub, the Department plans to utilize 24.25 acres of the 76 to address impacts to waters of the State.	2.16-41	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
Animals										
ANI-1 To avoid potential effects to special status raptors and other nesting birds protected by the Migratory Bird Treaty Act (MBTA), vegetation clearing and preliminary ground disturbance work will be completed outside of bird breeding season (typically set as February 15 through August 31). In the event that initial groundwork cannot be conducted outside the bird	2.18-6	Resident Engineer / District Biologist / Design-Builder	Prior to ground disturbing activities							

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									YES	NO
breeding season, focused surveys will be conducted prior to ground disturbing activities. Should nesting birds be found, an exclusionary buffer will be established by the biologist. The buffer may be up to 500 feet in diameter depending on the species of nesting bird found. This buffer will be clearly marked in the field by construction personnel under guidance of the biologist, and construction or clearing will not be conducted within this zone until the biologist determines that the young have fledged or the nest is no longer active.										
ANI-2 Surveys for the presence of special status bat-species will be required prior to the commencement of construction. Because the species of bat may change between current surveys and the time of construction, and	2.18-7	Resident Engineer / District Biologist / Design-Builder	Prior to ground disturbing activities							

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									YES	NO
because avoidance and minimization measures are species specific, the precise measures cannot be determined at this time. Therefore, the application of appropriate avoidance and minimization measures regarding bats will require further investigation and potential mitigation as specified below:										
ANI-2-a A qualified bat biologist shall survey the project area in the 2012 Spring season to assess the potential for its use as a day and night roost which would allow time to deal with any bat issues that may arise and could be dealt with prior to construction. Since bat roosts can change seasonally, if bats are determined to be present during the 2012 Spring survey, the qualified bat biologist will also perform pre-construction surveys each subsequent spring prior to construction activities involving	2.18-7	Resident Engineer / District Biologist / Design-Builder	Prior to ground disturbing activities							

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									YES	NO
existing bridge structures. The surveys will include a combination of structure inspection, sampling, exit counts, and acoustic surveys. The acoustic survey assesses the frequency of sounds emitted by the bats and is used to determine the species of bats that are present.										
ANI-2-b A night roost refers to a structure (natural or built) in which bats roost during the evening between foraging bouts. There would be minimal or no impacts to bats if construction activity is limited to daytime hours, the existing structures utilized by the bats for roosting are not removed or altered, vegetation adjacent to these structures is not cleared, and the airspace to access the structures is not restricted. If nighttime construction activity is anticipated, or if major modifications will be made to the bridges or culverts that may reduce their suitability for night roosting, the potential night	2.18-7	Resident Engineer / District Biologist / Design-Builder	Prior to construction							

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									YES	NO
roosting areas within the BSA will require further investigation during the preparation of the final project plans through acoustic monitoring to yield more precise information with regard to presence, species composition, and the approximate number of bats utilizing the structures for roosting. This information would then be used to determine the appropriate avoidance and minimization measures that would minimize impacts to night-roosting bats.										

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									YES	NO
ANI-2-c Although bridge and culvert roosts can be relatively easy to identify, tree roosts are more subtle and require close examination. In order to avoid potential direct impacts to roosting bats, if tree removal or trimming is necessary for project construction, large trees and snags should be examined by a bat biologist in the spring season preceding construction prior to removal or trimming to ensure that no roosting bats are present.	2.18-8	Resident Engineer / District Biologist / Design-Builder	Prior to ground disturbing activities							
ANI-2-d An additional daytime assessment should be conducted in the spring prior to the start of construction to reexamine the crevices that may be suitable for use by day roosting bats. If day roosting bats are present or their presence is assumed in structures that will be directly affected by construction activities, exclusionary devices may need to be placed in the fall (September or October) to avoid potential direct impacts to bats.	2.18-8	Resident Engineer / District Biologist / Design-Builder	Prior to ground disturbing activities							

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									YES	NO
ANI-2-e The biologist will stipulate the appropriate time of year (normally the fall and winter) for construction at potential roosting sites (e.g., bridge structures) to avoid impacts to roosting bats. After surveys are completed during the spring 2012 season, depending on the results, appropriate avoidance and minimization measures will be specified by a qualified bat biologist. Avoidance and minimization measures may include some or all of the following: exclusionary devices and changing staging areas, access routes, and lighting.	2.18-8	Resident Engineer / District Biologist / Design-Builder	Prior to ground disturbing activities							
ANI-3 Prior to commencement of any construction in Cajon Creek, the Department shall review and approve a speckled dace relocation plan that will include the following elements:	2.18-8	Resident Engineer / District Biologist / Design-Builder	Prior to ground disturbing activities							
ANI-3-a Ongoing surveying for the presence of speckled dace in Cajon Creek by a qualified biologist.	2.18-8	Resident Engineer / District Biologist / Design-Builder	During Design-Build							

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									YES	NO
ANI-3-b Review of proposed grading activities to ensure that no ponds are created that might entrap speckled dace.	2.18-8	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
ANI-3-c Plans for water diversion, if needed.	2.18-8	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
ANI-3-d Relocation plans for any speckled dace that might be identified.	2.18-8	Resident Engineer / District Biologist / Design-Builder	Prior to ground disturbing activities							
ANI-4 Prior to the commencement of any construction in Cajon Creek, the Department shall review and approve a two-striped garter snake relocation plan that will include the following elements:	2.18-9	Resident Engineer / District Biologist / Design-Builder	Prior to ground disturbing activities							
ANI-4-a The SBKR monitors will be trained to survey for the presence of the two-striped garter snake. Any such snakes found will be appropriately relocated outside the	2.18-9	Resident Engineer / District Biologist / Design-Builder	During Design-Build							

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									YES	NO
construction area.										
ANI-4-b Plans for water diversion and the potential to encounter the snake will be developed.	2.18-9	Resident Engineer / District Biologist / Design-Builder	Prior to ground disturbing activities							
Threatened and Endangered Species										
Efforts for San Bernardino Kangaroo Rat *- Measures Incorporated into Project Design*										
ES-1 Widening of I-15 south of Cajon Creek was shifted into the median rather than outside widening to avoid impacts to SBKR habitat and waters of the U.S. and State.	2.19-26	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
ES-2 In areas where feasible, the project footprint was minimized through the use of 2:1 slopes rather than the Department standard 4:1 slopes.	2.19-26	Resident Engineer / District Design / District Biologist / Design-Builder	During Design-Build							
ES-3 To minimize potential impacts to SBKR habitat and to waters of the U.S and State, the following design refinements	2.19-26	Resident Engineer / District Design / District Biologist /	During Design-Build							

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									YES	NO
have been incorporated into the proposed reconnection of Cajon Boulevard:		Design-Builder								
ES-3-a The design speed of the roadway was reduced to allow for tighter curves. This reduction in design speed allowed for reduced habitat impacts as follows:	2.19-27	Resident Engineer / District Design / District Biologist / Design-Builder	During Design-Build							
ES-3-a-i West of the I-15 undercrossing, Cajon Boulevard was aligned as close as possible to the I-15 freeway to minimize the extent of the habitat island created between Cajon Boulevard and I-15.	2.19-27	Resident Engineer / District Design / District Biologist / Design-Builder	During Design-Build							
ES-3-a-ii East of the I-15 undercrossing Cajon Boulevard was aligned as close as possible to the existing developed parcels that front on Old Cajon Boulevard to limit impacts to the habitat between Cajon Boulevard and	2.19-27	Resident Engineer / District Design / District Biologist / Design-Builder	During Design-Build							

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									YES	NO
the Creek.										
ES-3-a-iii The edge of the embankment for Cajon Boulevard adjacent to Cajon Creek will be protected by a retaining wall rather than by slopes, reducing the impacts to SBKR habitat.	2.19-27	Resident Engineer / District Design / District Biologist / Design-Builder	During Design-Build							
ES-3-a-iv An approximately 3-foot solid wall will be constructed along the reconnection of Cajon Boulevard, to shield Cajon Creek and adjacent SBKR habitat from car lights.	2.19-27	Resident Engineer / District Design / District Biologist / Design-Builder	During Design-Build							
ES-4 Impacts of the reopening of the closed portion of existing Cajon Boulevard between Kenwood Avenue and its current southern terminus were reduced by the following measures:	2.19-27	Resident Engineer / District Design / District Biologist / Design-Builder	During Design-Build							
ES-4-a Maintaining and utilizing the existing closed roadbed as much as possible.	2.19-27	Resident Engineer / District Design / District Biologist /	During Design-Build							

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									YES	NO
		Design-Builder								
ES-4-b Limiting capacity on Cajon Boulevard between Kenwood Avenue and Devore Road/Glen Helen Parkway to one lane in each direction (instead of the originally proposed four-lane roadway, two lanes in each direction).	2.19-27	Resident Engineer / District Design / District Biologist / Design-Builder	During Design-Build							
Efforts for San Bernardino Kangaroo Rat *- Compensatory Measure for Permanent Take of Habitat*										
ES-5 To offset permanent and temporary impacts to SBKR suitable habitat (occupied and potentially occupied), the Department will purchase credits within the Cajon Creek Conservation Bank or another accredited conservation bank for SBKR according to the ratios specified in the table below. In addition, temporary effects will be offset by restoring habitat to pre-project conditions. Please see Appendix M in the Department's	2.19-27	Resident Engineer / District Biologist / Landscape Architecture / Design-Builder	During Design-Build							

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									YES	NO
BA (2011).										
Efforts for San Bernardino Kangaroo Rat *- Measures to Reduce Impacts During Construction*										
ES-6 A biologist with knowledge about SBKR and its habitat will be retained to function as a biological monitor. The biological monitor will hold a valid Section 10(a)(1)(A) permit for SBKR. At least 30 days prior to initiating project activities, the name(s), any permit numbers, and resumes of all prospective biological monitors will be submitted, in writing, to the Palm Springs Fish and Wildlife Office (PSFWO). Project activities will not begin until the PSFWO approves a biological monitor or monitors. If no response is received within 30 days, the Department will contact the USFWS regarding status.	2.19-28	Resident Engineer / District Biologist / Design-Builder	Prior to ground disturbing activities							
ES-7 Prior to clearing or construction and under the supervision of the approved	2.19-28	Resident Engineer / District Biologist /	Prior to ground disturbing activities							

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									YES	NO
biological monitor, highly visible barriers (such as orange construction fencing) will be installed around scalebroom scrub communities (*Lepidospartum squamatum,* Alliance, Sawyer et al. 2009) adjacent to the project footprint to designate Environmentally Sensitive Areas (ESAs) to be protected from construction impacts. No grading or fill activity of any type will occur within these ESAs. In addition, heavy equipment, including motor vehicles, will not drive or operate within the ESAs. All construction equipment will be operated in a manner to prevent accidental damage to nearby protected areas. No structure of any kind, or incidental storage of equipment or supplies, will occur within these protected zones		Design-Builder								
ES-8 The biological monitor will ensure compliance with the	2.19-28	Resident Engineer /	Prior to ground							

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									YES	NO
project description evaluated in the project biological opinion, including all conservation measures and terms and conditions, and will have the authority to halt/suspend all activities until appropriate corrective measures have been taken.		District Biologist / Design-Builder	disturbing activities							
ES-9 The biological monitor will report any non-compliance within 24 hours to the Palm Springs Fish and Wildlife Office (PSFWO).	2.19-29	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
ES-10 The biological monitor will develop and conduct an environmental awareness education program for all construction personnel (including temporary design-builders and subcontractors) before any work is begun on or adjacent to the project site. At a minimum, the information presented will include (1) the purpose of resource protection; (2) a description of	2.19-29	Resident Engineer / District Biologist / Design-Builder	During Design-Build							

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									YES	NO
SBKR and its habitat; (3) a description of the arroyo toad and its critical habitat; (4) the conservation measures that will be implemented in conjunction with project construction; (5) delineation and flagging of the project area, and limitations on movement of personnel and equipment and; (6) the general provisions of the Act including the legal status of SBKR, arroyo toad and the meaning of "take."										
ES-11 Before any ground disturbance begins and under the supervision of the approved biological monitor, the design-builder will delineate and mark all limits of construction to be clearly visible to all personnel. All construction-related activities by design-builders, subcontractors or their agents, and equipment (including vegetation removal, grading, equipment lay-down and storage, and design-builder	2.19-29	Resident Engineer / District Biologist / Design-Builder	Post construction							

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									YES	NO
parking) will be restricted to the designated limits of construction and staging areas. Construction staging and equipment storage will be located outside of any potential habitat areas. All movement of design-builders, subcontractors or their agents, and equipment will be restricted to the limits of construction and staging areas. Black mesh silt fencing will be installed to prevent accidental deposition of fill material in areas where vegetation is immediately adjacent to planned grading activities. The biological monitor will inspect the fencing at the close of each business day throughout the construction phase. The design-builder will implement any required repairs to the fencing within 24 hours of receiving notification of the required repair. Should any work occur beyond the fenced or										

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									YES	NO
demarcated limits of impact, the biological monitor will request that the resident engineer halt work until the problem has been remedied. The biological monitor will notify the PSFWO of the problem within 24 hours of its occurrence.										
ES-12 Prior to project-related vegetation clearing and grading within SBKR suitable habitat areas, an exclusionary fence will be installed, as necessary, around the limits of SBKR suitable habitat (category 1) areas. The exclusionary fence will consist of a 5-feet-tall chain link fence with a ¼-inch gauge wire mesh strip (e.g., hardware cloth) attached to the inside base of the chain link fence. The wire mesh will be buried to a minimum depth of 12 inches below the ground surface and have a minimum height of 4 feet above ground	2.19-30	Resident Engineer / District Biologist / Design-Builder	Prior to ground disturbing activities							

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									YES	NO
level. The proposed fence design will be submitted to and approved by the PSFWO at least 30 days prior to emplacement and grading. The qualified biologist experienced with SBKR will be present on-site when the fence is installed to minimize the disturbance of SBKR burrows from the fence installation. During fence construction, the biological monitor or other qualified biologist holding a 10(a)(1)(A) permit will hand-excavate marked burrows within 100 feet in advance of the trenching backhoe; if necessary, another biologist will stand by the backhoe to observe any animals caught up in the backhoe bucket. The SBKR permitted biologist will remove any SBKR found in the burrow or backhoe bucket and release them outside the fence alignment. A fence design will be submitted to the PSFWO for approval at least 30 days prior to										

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									YES	NO
emplacement.										
ES-13 After any required exclusionary fence is in place, and before initial ground disturbance construction activities, the fenced area will be trapped and all small mammals captured will be removed and released outside the project footprint to adjacent suitable habitat. The biological monitor or other qualified biologist holding a valid section 10(a)(1)(A) permit will live-trap and remove as many SBKR as possible from within the enclosed construction area and recapture any SBKR that return to the site. Trapping will continue for at least 5 consecutive nights, or until there have been 2 consecutive nights of trapping with no SBKR captures, or until PSFWO has provided written or verbal approval to discontinue trapping. The SBKR permitted	2.19-30	Resident Engineer / District Biologist / Design-Builder	Prior to ground disturbing activities							

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									YES	NO
biologist will mark all SBKR captures on the chest with a red Sharpie pen (or comparable pen) to identify any recaptures that re-enter the fenced area and will report the number of captures and recaptures to the PSFWO.										
ES-14 At the beginning and close of each work day throughout the duration of construction, the design-builder or biological monitor will inspect unfilled excavations, unburied pipes, and soils stockpiles for the presence of any SBKR that may be entrapped. The SBKR-permitted biologist will remove and release the entrapped animals outside the project footprint to adjacent habitat. At the close of each work day, and after any discovered SBKR have been removed, the design-builder will backfill, cover, or otherwise close all excavations or unburied pipes; temporarily	2.19-30	Resident Engineer / District Biologist / Design-Builder	Prior to ground disturbing activities							

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									YES	NO
store and cover soils stockpiles within the designated temporary work area (and not outside that area where SBKR may burrow overnight); and inspect the exclusionary fencing and immediately repair any gaps larger than 0.5 in.										
ES-15 During construction, the biological monitor will conduct walk-over surveys of the project area at least 2 days a week (or other interval approved by the PSFWO) before the start of daily activities for the purpose of detecting any evidence that SBKR are entering the construction footprint. During these walk-over surveys, the biological monitor will remove any live SBKR from the construction area and locate any dead or injured SBKR within the limits of construction.	2.19-31	Resident Engineer / District Biologist / Design-Builder	Prior to ground disturbing activities							

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									YES	NO
ES-16 When trapping, collecting, and releasing any SBKR found in the construction area or vicinity during the course of work, the biological monitor/biologist will implement the following measures:	2.19-31	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
ES-16-a Locate all traps in areas that best typify SBKR habitat, and place them in sufficient numbers to provide adequate coverage of suitable habitat. Mark all trap locations with flagging, reflective tape, or other technique that is visible under day and night conditions, and at a distance of at least 16.3 ft.	2.19-31	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
ES-16-b Use only 12-inch Sherman or wire-mesh live traps; 9-inch models may be used only if obtained before March 13, 1990. Ensure all trap models are modified to eliminate or substantially reduce the risk of SBKR injury (e.g., tail lacerations or excisions). Do not place any	2.19-31	Resident Engineer / District Biologist / Design-Builder	During Design-Build							

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									YES	NO
batting in the traps.										
ES-16-c Sterilize traps previously used outside of San Bernardino County.	2.19-31	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
ES-16-d Conduct trapping only if the nightly low temperature is forecast to be 50 degrees Fahrenheit or above, and if no extended periods of wind, rain, fog, or other inclement weather will occur to make conditions unsuitable for trapping or will unduly imperil the lives of the animals.	2.19-31	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
ES-16-e Adjust traps by hand each time they are placed, set, and baited, at a sensitivity level appropriate for capturing SBKR. Visually inspect all traps before closing, and close them by hand.	2.19-31	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
ES-16-f Check all traps at least twice each night, once near midnight and again at sunrise.	2.19-31	Resident Engineer / District Biologist /	During Design-Build							

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									YES	NO
		Design-Builder								
ES-16-g Identify all trap locations with a unique identification code on a log sheet, note the date and time each trap is checked, and periodically review the log sheet to ensure no traps are inadvertently missed. Field documentation shall be available to Service personnel upon request.	2.19-32	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
ES-16-h Hold individual SBKR for no longer than 1 hour before releasing them, and relocate them as quickly as possible. Do not place the animal in a plastic bag; transfer it in a clean, structurally sound, breathable container with adequate ventilation. Do not at any time allow the animal to become stressed due to temperature extremes (either hot or cold).	2.19-32	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
ES-17 The approved biological monitor will prepare a weekly	2.19-32	Resident Engineer /	During Design-							

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									YES	NO
monitoring memo to document the construction activities, describe the conservation measures utilized, and report any observations of live or dead SBKR for transmittal to the Department and PSFWO until construction is complete.		District Biologist / Design-Builder	Build							
ES-18 The approved biological monitor will submit annual reports on vegetation restoration activities and results as specified in the restoration plan for the temporary impact areas.	2.19-32	Resident Engineer / District Biologist / Landscape Architecture / District Maintenance / Design-Builder	During Design-Build					Any reports with duration requirements must satisfy said requirements.		
ES-19 The design-builder will ensure that Service personnel have the right to access and inspect the project site during project implementation (with prior notification from the Service) for compliance with the project description, conservation measures, and terms and conditions of the Biological	2.19-32	Resident Engineer / District Biologist / Design-Builder	Prior to construction							

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									YES	NO
Opinion.										
ES-20 No night work will be conducted in SBKR habitat areas. When night work is conducted adjacent to SBKR habitat areas, noise and lighting will be directed away from these habitats.	2.19-32	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
ES-21 After construction is complete, and at the direction of the Department Biologist, the design-builder will remediate compacted soils in the temporary work area by ripping all areas not directly in the active channels (ordinary high water mark) to a depth of about 1 foot. Stockpiled sand and cobble topsoil will be placed to an appropriate depth (about 1 foot) to provide SBKR burrowing substrates of soil densities similar to pre-construction conditions.	2.19-32	Resident Engineer / District Biologist / Design-Builder	Post Construction							
ES-22 The following Best Management Practices (BMPs) will be implemented during	2.19-32	Resident Engineer / District Biologist /	During Design-Build							

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									YES	NO
project construction:		District Storm Water / Design-Builder								
ES-22-a According to the Water Quality Assessment prepared for the project, temporary construction effects to water quality are subject to the Department Storm Water Quality Handbooks, which provide the working details for critical, temporary Construction Site BMPs. The handbooks provide guidelines for the proper design, implementation, and maintenance of construction BMPs. The Storm Water Pollution Prevention Plan (SWPPP) for the proposed project will identify the specific BMPs to be implemented during project construction so as not to cause or contribute to an exceedance of any applicable water quality standard contained	2.19-33	Resident Engineer / District Biologist / District Storm Water / Design-Builder	During Design-Build							

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									YES	NO
in a Statewide Water Quality Control Plan and/or the Santa Ana RWQCB Basin Plan. These BMPs will meet the Best Available Technology/Best Control Technology requirement as stipulated in the Department National Pollution Discharge Elimination System Permit.										
ES-22-b All equipment maintenance and dispensing of fuel, oil, coolant, or any other such activities will be restricted to designated staging areas to prevent the release of hazardous substances into the project site or drainages (i.e., Cajon Creek, Cable Creek, Lytle Creek or their tributaries). Any accidental spills will be immediately contained and properly disposed of.	2.19-33	Resident Engineer / District Biologist / District Storm Water / Design-Builder	Prior to construction							
ES-22-c No pets will be allowed in, or adjacent to, the project site.	2.19-33	Resident Engineer /	During Design-Build							

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									YES	NO
		Design-Builder								
ES-22-d No rodenticides, herbicides, insecticides, or other chemicals will be used that could be harmful to the SBKR or SBKR or arroyo toad critical habitats.	2.19-33	Resident Engineer / Design-Builder	During Design-Build							
ES-22-e Trash will be stored in closed containers so that it is not readily accessible to scavengers, (e.g., crows and raccoons) and will be removed from the construction site on a daily basis so as not to attract potential SBKR predators.	2.19-33	Resident Engineer / Design-Builder	During Design-Build							
ES-22-f Spoils and rubble will not be deposited outside the limits of construction and all fill material and waste will be disposed of properly and removed from the construction site on a daily basis.	2.19-33	Resident Engineer / Design-Builder	During Design-Build							
ES-22-g Erosion control, fuel spill cleanup, and mandated	2.19-33	Resident Engineer /	During Design-							

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									YES	NO
equipment noise control measures will be used at all times.		District Biologist / Design-Builder	Build							
ES-23 Implement the conservation measures as specified in the project description evaluated in the biological opinion. If the biological monitor detects impacts to SBKR from project-related activities in excess of those described in the incidental take statement, the Department, their agents, or the biological monitor will contact the PSFWO immediately.	2.19-33	Resident Engineer / District Biologist / Design-Builder	Prior to ground disturbing activities							
Efforts for San Bernardino Kangaroo Rat *- Restoration Activities after Construction*										
ES-24 Prior to initiating project impacts, the Department will develop a restoration plan for the temporary impact areas. The plan will be submitted to the PSFWO for review and approval no later than 30 days prior to initial ground-disturbing activities.	2.19-34	Resident Engineer / District Biologist / Design-Builder	During Design-Build							

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									YES	NO
ES-25 Following Project construction, all disturbed habitat adjacent to Pittman Canyon, Middleman Canyon, Cajon Creek, and Burlington Northern Santa Fe Railroad wildlife crossings will be restored with native vegetation.	2.19-34	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
ES-26 The Department will develop appropriate restoration plans for any temporarily impacted areas within SBKR suitable habitat. Such restoration plans will be implemented immediately following the completion of construction. Restoration plans will be submitted to PSFWO for approval no later than 30 days prior to ground-disturbing activities. In some areas during initial ground-disturbing activities, the upper 6 inches of topsoil will be salvaged and stockpiled for use	2.19-34	Resident Engineer / District Biologist / Design-Builder	During Design-Build							

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									YES	NO
in areas to be revegetated. Upon completion of construction, the temporary impact areas will be revegetated with native plant species consistent with those found adjacent to affected areas. A Department biologist will approve the native plant palette to be used in areas to be revegetated. No species listed on Cal-IPC's California Invasive Plant Inventory that have a high or moderate rating will be used for revegetation. Components of the restoration plan shall include methods for recontouring the land, replacing the topsoil (if it was collected), planting seed and/or container stock, and maintaining (i.e., weeding, replacement planting, supplemental watering, etc.) and monitoring the restored area for a period of five years (or less if the restoration meets all success criteria). Also, this plan will										

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									YES	NO
include a detailed description of restoration methods, slope stabilization and erosion control, criteria for restoration to be considered successful, and monitoring protocol(s). Following the completion of construction activities, these temporary impact areas will be planted as soon as possible to prevent encroachment by nonnative invasive weeds. The restoration plan will be implemented for a minimum of 5 years, unless the Service agrees that success criteria are met earlier and no artificial water has been used for at least 2 years.										
ES-27 Following construction, all permanent lighting installed along the new freeway alignment will be permanently shielded and directed onto the roadway.	2.19-35	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
Efforts for Arroyo Toad										

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									YES	NO
ES-28 The Department will fund the habitat enhancement effort by entering into an agreement with Inland Empire Conservation District (IERCD) and the Santa Ana Watershed Authority (SAWA) to perform in-stream enhancement of arroyo toad habitat within Cajon Wash upstream of the proposed project site. The Department will fund the enhancement of one acre of arroyo toad habitat within Cajon Wash to offset 0.15 acre of permanent effects and 0.06 acre of temporary effects to arroyo toad critical habitat. This in-stream enhancement location will be within the same critical habitat unit as the area affected. Prior to ground-disturbing activities, the Department will provide the PSFWO with a copy of the agreement with the Inland Empire Resource Conservation District and Santa Ana	2.19-35	Resident Engineer / District Biologist / Design-Builder	During Design-Build							

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									YES	NO
Watershed Authority.										
ES-29 A biologist with knowledge of arroyo toad and its habitat will be retained to function as a biological monitor for work in areas within or adjacent to arroyo toad critical habitat.	2.19-35	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
ES-29-a The biological monitor will ensure compliance with the project description including any Conservation Measures and Terms and Conditions identified in the January 27, 2012, Biological Opinion issued for project effects to listed species discussed in the project BSA.	2.19-35	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
ES-29-b The biological monitor will develop and implement a design-builder education program to be provided to all personnel (including temporary design-builders and subcontractors) over the life of the project. Prior to conducting any work on the site, personnel will be instructed	2.19-35	Resident Engineer / District Biologist / Design-Builder	During Design-Build							

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									YES	NO
regarding: • The purpose of resource protection • Description of the arroyo toad and its critical habitat • Conservation measures that will be implemented in conjunction with project construction • General provisions of the FESA										
ES-29-c The biological monitor will be present during vegetation clearing and grading prior to project construction and during construction to monitor habitat conditions and construction impacts as deemed necessary in coordination with the PSFWO.	2.19-35	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
ES-30 Prior to any ground disturbance, all limits of project construction will be delineated and marked so as to be clearly visible to personnel on foot and in heavy equipment. All	2.19-36	Resident Engineer / District Biologist / Design-Builder	During Design-Build							

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									YES	NO
construction-related activities (e.g., vegetation removal, grading, equipment lay-down and storage, and design-builder parking) will occur inside the limits of construction. Construction staging and equipment storage will be located outside of any potential habitat areas. All movement of design-builders, subcontractors, or their agents and equipment will be restricted to the limits of construction and staging and equipment storage areas.										
ES-31 No night work will be conducted in arroyo toad critical habitat. When night work is conducted adjacent to arroyo toad critical habitat areas, noise and lighting would be directed away from critical habitat areas.	2.19-36	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
ES-32 To implement reasonable and prudent measure number 2 (monitor and report on compliance/effectiveness of	2.19-36	Resident Engineer / District Biologist /	During Design-Build							

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									YES	NO
conservation measures), the Department shall:		Design-Builder								
ES-32-a Submit a monthly report to PSFWO covering results of the biological monitor's visits to the Project site during all phases of project construction, until construction is complete.	2.19-36	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
ES-32-b Submit annual reports on vegetation restoration activities and results as specified in the restoration plan for the temporary impact areas.	2.19-36	Resident Engineer / District Biologist / Design-Builder	During Design-Build					Any reports with duration requirements must satisfy said requirements.		
ES-32-c Ensure Service personnel have the right to access and inspect the Project site during project implementation (with prior notification from the Service) for compliance with the project description, conservation measures, and terms and conditions of the project	2.19-36	Resident Engineer / District Biologist / Design-Builder	During Design-Build							

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									YES	NO
biological opinion.										
General Measure to Protect Species During Structure Demolition										
ES-33 During demolition of any structure, if listed or sensitive species are found within the structure, non-lethal methods of removal must be undertaken to remove the sensitive or listed species from the structure. Species with no status may be exterminated after identification by the biological monitor. Relocation of listed species will follow specifications found within the Biological Opinion; sensitive species shall be relocated in areas of suitable habitat at the maximum possible distance from residential or commercial structures within the project area. In cases where no special status species are found within a structure to be demolished, lethal extermination methods will be	2.19-36	Resident Engineer / District Biologist / Design-Builder	During Design-Build							

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									YES	NO
chosen to target the interior of the structure.										
Invasive Species										
Measures to be Implemented Prior to the Beginning of Construction										
INV-1 Prior to the start of any grading:	2.20-2									
INV-1-a The construction site shall be surveyed well in advance of construction (12 months if possible), and existing native plant materials will be collected on site. Sufficient time should be allocated for a professional seed company to visit the project site during the appropriate season and collect the native plant seed. If a decision is made to collect seed from USFS lands, a forest products permit will be obtained beforehand. Seeds will be stored appropriately until use.	2.20.2	Resident Engineer / District Biologist / Design-Builder	Prior to construction							

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									YES	NO
INV-1-b The location of existing invasive species within the planned construction footprint will be mapped and documented (including, but not limited to, fennel, tamarisk and tree of heaven). Invasive species occurrence documentation will include: • USFS location information for the project area • Field Surveys • Description of the methods used to detect and document invasive species occurrences	2.20-2	Resident Engineer / District Biologist / Design-Builder	Prior to construction							
INV-1-c A Final Invasive Species Removal Map will be prepared based on the above, which will be confirmed and accepted by the Department Biologist.	2.20-3	Resident Engineer / District Biologist / Design-Builder	Prior to construction							
INV-1-d The design-builder shall appoint an Invasive Species Monitor tasked with ensuring that the measures that follow are	2.20-3	Resident Engineer / District Biologist /	Prior to construction							

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									YES	NO
implemented during all phases of construction.		Design-Builder								
Measures to be Implemented during Initial Clearing and Grubbing										
INV-2 During all initial clearing and grubbing operations, the Invasive Species Monitor shall ensure that the following measures are implemented:	2.20-3	Resident Engineer / District Biologist / Design-Builder	Prior to ground disturbing activities							
INV-2-a Invasive species in the work area shall be removed from the site prior to seed set based upon the mapping created in INV-1.	2.20-3	Resident Engineer / District Biologist / Design-Builder	Prior to ground disturbing activities							
INV-2-b For all species of invasive woody plants in areas of potential disturbance within the construction footprint, either remove the whole plant including all roots if feasible, or cut and stump treat with a Department approved aquatic herbicide using the cut and daub method within	2.20-3	Resident Engineer / District Biologist / Design-Builder	During Design-Build							

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									YES	NO
minutes of cutting. Resulting cut biomass should be appropriately disposed of off-site. If seed is present when cut, the vehicles carrying the cut biomass shall be covered well enough to prevent loss of seed or root material in transport. If herbicide application is not feasible, cutting is not recommended unless the stumps will be permanently buried under at least 4 feet of fill or covered with pavement.										
INV-2-c Soil and vegetation disturbance will be minimized to the greatest extent feasible.	2.20-3	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
INV-2-d During initial ground disturbing activities, the upper six inches of topsoil will be salvaged and stockpiled for potential re use in areas to be revegetated (except for areas currently	2.20-3	Resident Engineer / District Biologist / Design-Builder	During Design-Build							

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									YES	NO
infested with invasive species).										
INV-2-e Excavated soil from areas with invasive species populations will be kept separate from other soil and removed and appropriately disposed of 1) off-site or 2) placed in areas to be covered with concrete or at least four feet of additional fill.	2.20-3	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
Measures to be Implemented during All Periods of Construction										
INV-3 During all construction operations, the Invasive Species Monitor shall ensure that the following measures are implemented.	2.20-3	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
INV-3-a No storage or staging areas will be located on USFS lands.	2.20-4	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
INV-3-b Trucks with loads carrying vegetation shall be	2.20-4	Resident Engineer /	During Design-							

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									YES	NO
covered and vegetative materials removed from the site shall be disposed of in accordance with all applicable laws and regulations.		District Design / District Biologist / Design-Builder	Build							
INV-3-c During construction, the construction design-builder will ensure implementation of appropriate dust control measures, to prevent excessive amounts of dust, and to control the aeolian removal of weeds and seeds from stockpiled materials. All active portions of the construction site are watered a minimum of three times daily, consistent with dust control measures specified in air quality Measures AQ-1 through AQ-4 in Section 2.13.4 (Air Quality) of this Environmental Document, to prevent excessive amounts of dust and to control the aeolian removal of weeds and seeds from stockpiled materials.	2.20-4	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
INV-3-d All material stockpiled is sufficiently watered or covered to prevent excessive amounts of	2.20-4	Resident Engineer / District Biologist /	During Design-Build							

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									YES	NO
dust.		Design-Builder								
INV-3-e Soil/gravel/rock shall be obtained from weed-free sources, to the extent practicable.	2.20-4	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
INV-3-f The design-builder shall identify the source of fill material for construction work performed on USFS land and immediately adjacent (100') and will obtain approval from USFS prior to its use.	2.20-4	Resident Engineer / District Biologist / Design-Builder	Prior to ground disturbing activities							
INV-3-g To the extent practicable only certified weed-free straw, mulch, and/or fiber rolls will be used for erosion control to the maximum extent practicable.	2.20-4	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
INV-3-h Erosion and sediment control devices, including certified weed-free straw, mulch, fiber rolls, and bonded fiber matrix, will be made from biodegradable materials such as jute, with no plastic mesh, to avoid creating a wildlife entanglement hazard.	2.20-4	Resident Engineer / District Biologist / Design-Builder								

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									YES	NO
INV-3-i The design-builder will be responsible for ensuring the inspection and cleaning of construction equipment at the beginning of each work day and prior to transporting equipment from one project location to another. All equipment used on the project site shall be field cleared of dirt and vegetation debris within the infested area prior to moving the equipment into non-infested areas of the project and documented in a form approved by Department biologist.	2.20-4	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
INV-3-j Should an invasion occur during construction, appropriate eradication strategies will be employed.	2.20-4	Resident Engineer / District Biologist / Design-Builder	During Design-Build							
Measures to be Implemented during Revegetation and Restoration Activities										
INV-4 During all landscaping and restoration activities, the following measures shall be implemented.	2.20-5	Resident Engineer / District Biologist / Landscape Architecture / Design-	During Design-Build							

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									YES	NO
		Builder								
INV-4-a To the extent practicable, restoration seeding will be conducted in the fall to maximize natural rainfall for watering.	2.20-5	Resident Engineer / District Biologist / Landscape Architecture / Design-Builder	During Design-Build							
INV-4-b Soil that was collected under measure INV-2-d shall be restored to create new top soil.	2.20-5	Resident Engineer / District Biologist / Landscape Architecture / Design-Builder	During Design-Build							
INV-4-c In compliance with the Executive Order on Invasive Species, E.O. 13112, the landscaping and erosion control included in the project will not use species listed on Cal-IPC's California Invasive Plant Inventory. The Department Biologist will approve the native plant pallet to be used in areas to be revegetated. In areas of particular sensitivity, extra	2.20-5	Resident Engineer / District Biologist / Landscape Architecture / Design-Builder	During Design-Build							

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									YES	NO
precautions will be taken if invasive species are found in or adjacent to the construction areas.										
INV-4-d Bare soil will be revegetated with the following (in order of preference): • The seed collected above under mitigation measure INV-1-a. If additional seed is needed, the seed mix shall be taken from native plant species from local Southern California genotypes (but not stock from coastal genotypes), and approved by the Department. Seed purity will be certified by planting seed labeled under the California Food and Agricultural Code or that has been tested within a year by a seed laboratory certified by the Association of Official Seed Analysts or by a seed technologist certified by the Society of Commercial Seed	2.20-5	Resident Engineer / District Biologist / Landscape Architecture / Design-Builder	During Design-Build							

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Avoidance, Minimization, and/or Mitigation Measures	Page # in Env. Doc.	Responsible for Development and/or Implementation of Measure	Timing/ Phase	If applicable, corresponding construction provision: (standard, special, non-standard)	Action(s) Taken to Implement Measure	Measure Completed (Date and Initials)		Remarks	Environmental Compliance	
									YES	NO
Technologists. Any such seed will be collected from within a 25 mile radius of the project site, and within an elevation range of 900 to1,500 feet mean sea level (MSL) and available for the scheduled planting time. If local propagules are not available or cannot be collected in sufficient quantities, materials collected or grown from other sources within southern California shall be substituted at the discretion of the District Biologist.										
Measures to be Implemented after Completion of Construction and Revegetation										
INV-5 After completion of construction and revegetation, the Department Biologist shall ensure the following measures are completed.	2.20-5	Resident Engineer / District Biologist / Landscape Architecture / Design-Builder	During Design-Build							
INV-5-a Identify any necessary eradication procedures (e.g.,	2.20-6	Resident Engineer /	During Design-							

Date: February 2012

ENVIRONMENTAL COMMITMENTS RECORD
(I-15 / I-215 Interchange Improvements Project)

08-SBd-15
PM 14.0 / R16.4

08-SBd-215
PM 16.0 / 17.8

EA 08-0K7100
PN 0800000366

Avoidance, Minimization, and/or Mitigation Measures	Page # in Env. Doc.	Responsible for Development and/or Implementation of Measure	Timing/ Phase	If applicable, corresponding construction provision: (standard, special, non-standard)	Action(s) Taken to Implement Measure	Measure Completed (Date and Initials)		Remarks	Environmental Compliance	
									YES	NO
spraying, hand weeding) should an invasion of nonnative plants occur; the use of herbicides will be prohibited within and adjacent to native vegetation, except as specifically authorized by the PSFWO and monitored by a Department biologist.		District Biologist / Landscape Architecture / Design-Builder	Build							
INV-5-b Monitor the erosion control and revegetation sites twice yearly (spring and fall) for three years from date of revegetation installation in a specific area, to detect and control the introduction/invasion of nonnative species.	2.20-6	Resident Engineer / District Biologist / Landscape Architecture / Design-Builder	During Design-Build							
INV-5-c Identify any necessary eradication procedures (e.g., spraying and/or hand weeding) should an infestation occur; the use of herbicides will be prohibited within and adjacent to native vegetation, except as specifically authorized and	2.20-6	Resident Engineer / District Biologist / Landscape Architecture / Design-Builder	During Design-Build							

Date: February 2012

ENVIRONMENTAL COMMITMENTS RECORD
(I-15 / I-215 Interchange Improvements Project)

08-SBd-15
PM 14.0 / R16.4

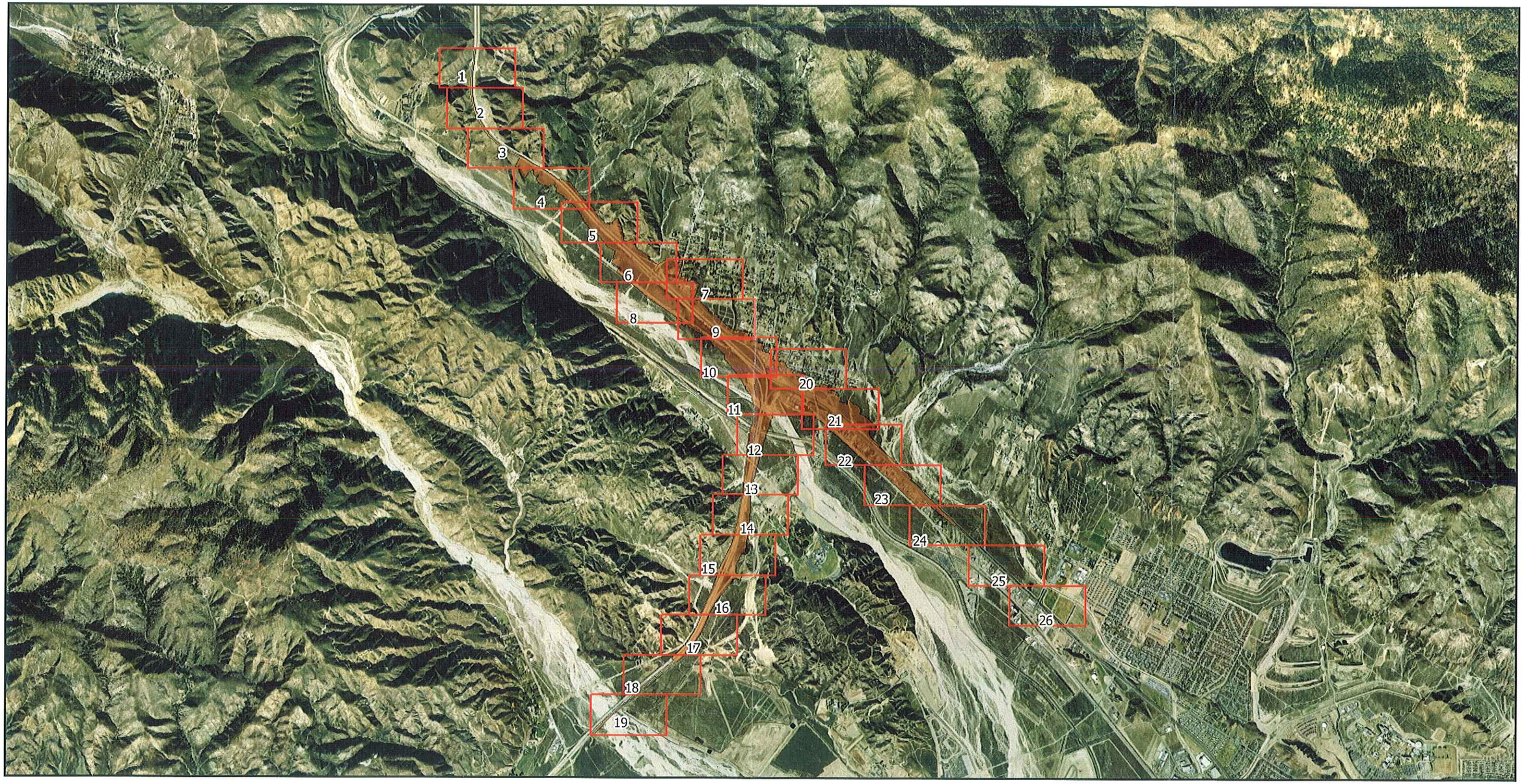
08-SBd-215
PM 16.0 / 17.8

EA 08-0K7100
PN 0800000366

Avoidance, Minimization, and/or Mitigation Measures	Page # in Env. Doc.	Responsible for Development and/or Implementation of Measure	Timing/ Phase	If applicable, corresponding construction provision: (standard, special, non-standard)	Action(s) Taken to Implement Measure	Measure Completed (Date and Initials)		Remarks	Environmental Compliance	
									YES	NO
monitored by the Department Biologist. Where herbicide application is not acceptable or feasible, woody stumps will be removed from the site and appropriately disposed of off-site, permanently buried under at least 4 feet of fill, or covered with pavement to avoid re-sprouts from stumps. Follow-up herbicide treatment of re-sprouts from cut stumps shall be conducted for a minimum of three years from stump removal.										

EXHIBIT 4-B

Area Of Potential Effect Map



N

0 2,000 4,000
FEET

Index IDs

Area of Potential Effect

Caltrans District 8 Project Manager — Date 1-26-11

Caltrans District 8 Architectural Historian (PQS) — Date 1/28/11

MAP 3

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange
Improvements Project

APE Index Map

SOURCE: AECom, 2010.

I:\LIM0705\Reports\Cultural\APE\INDEXMap3_APE_Mapbook.mxd (01/11/11)

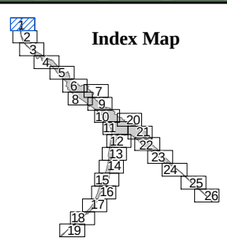
N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
- TCE
- Existing Local Agency ROW
- Freeway Edge of Pavement
- Local Edge of Pavement
- Bridges
- Matchline
- Retaining Walls
- (#) Resources Evaluated
- Grading Limits
- Bioswale
- Detention Basin
- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map



SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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MAP 3
SHEET 1 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange
Improvements Project

Area of Potential Effects

N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
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- TCE
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- Drainage Improvements
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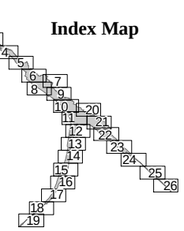
- San Bernardino National Forest

Index Map



MAP 3
SHEET 2 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange Improvements Project

Area of Potential Effects

SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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Matchline - Sheet 2 and Sheet 3

034906252

034906253

034906202

034906203

Begin Construction

15

Matchline - Sheet 3 and Sheet 4

N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
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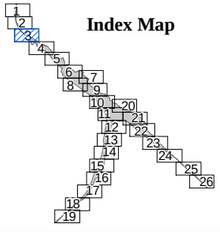
- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map



SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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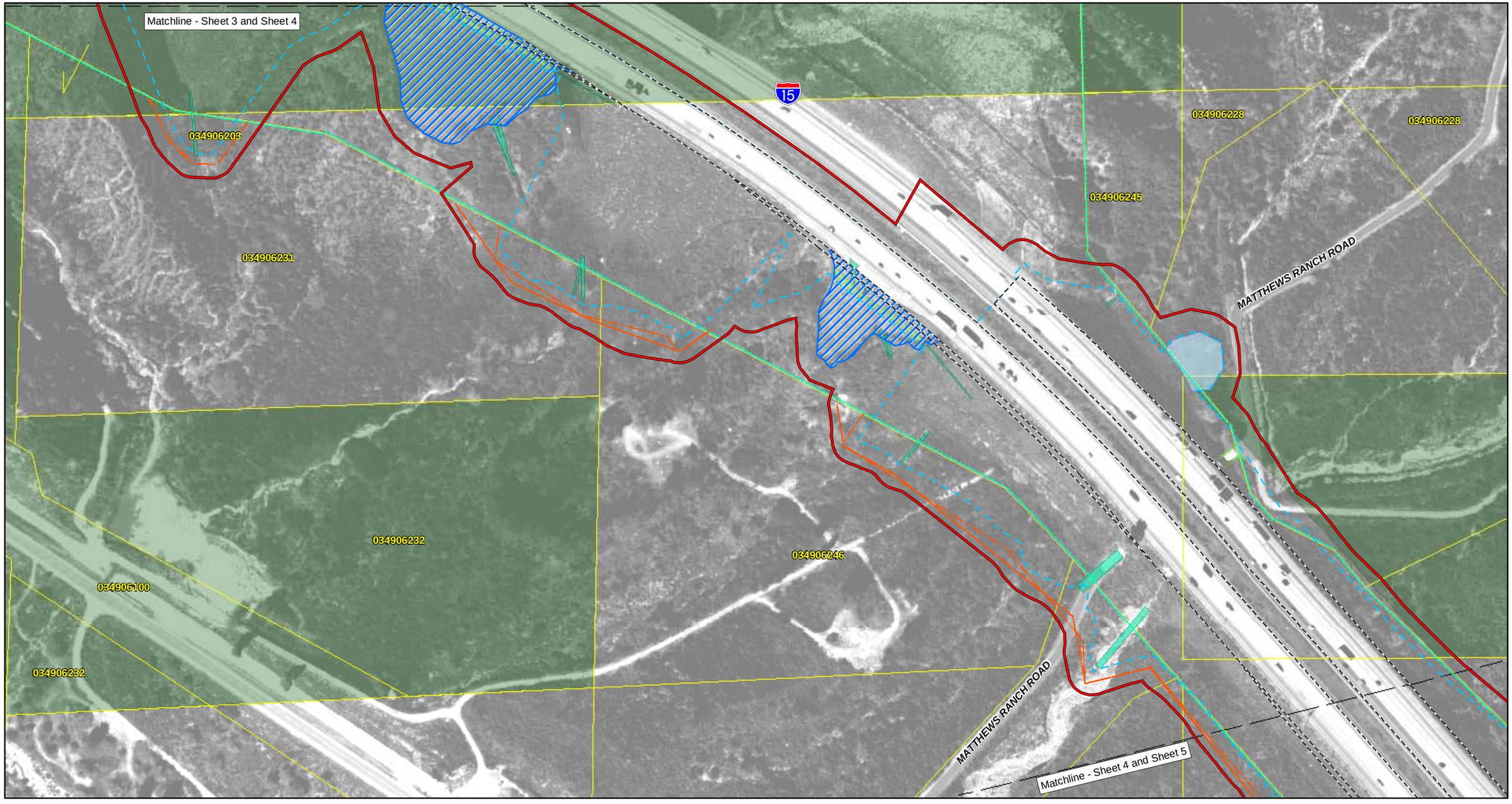
MAP 3

SHEET 3 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange Improvements Project

Area of Potential Effects



N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
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- (#) Resources Evaluated
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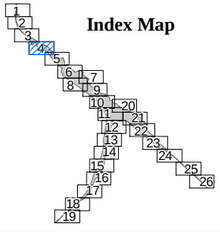
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map



SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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MAP 3

SHEET 4 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange Improvements Project

Area of Potential Effects

MATTHEWS RANCH ROAD

Matchline - Sheet 4 and Sheet 5

034906251

034906247

034906235

034906233

034906239

CAJON BOULEVARD

15

034910201

Matchline - Sheet 5 and Sheet 6

N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
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- Bioswale
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- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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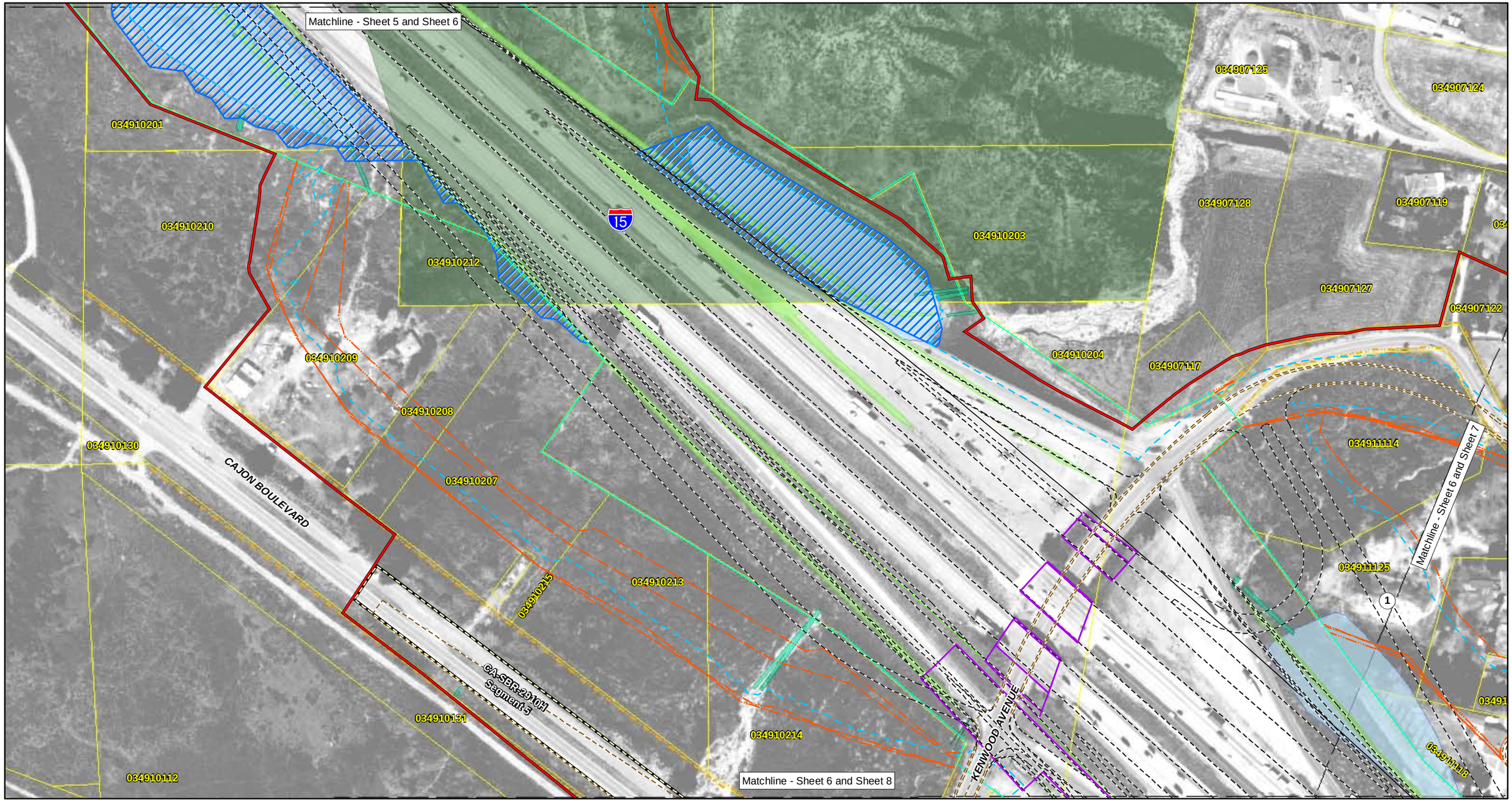
MAP 3

SHEET 5 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange
Improvements Project

Area of Potential Effects



N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
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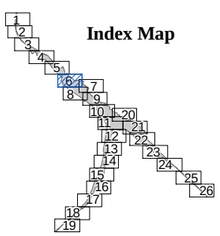
- Bioswale
- Detention Basin
- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map



MAP 3
SHEET 6 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange
Improvements Project

Area of Potential Effects

SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
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- Existing CalTrans ROW
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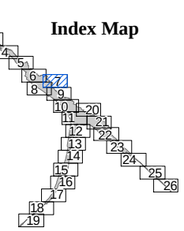
- Retaining Walls
- (#) Resources Evaluated
- Grading Limits
- Bioswale
- Detention Basin
- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map



SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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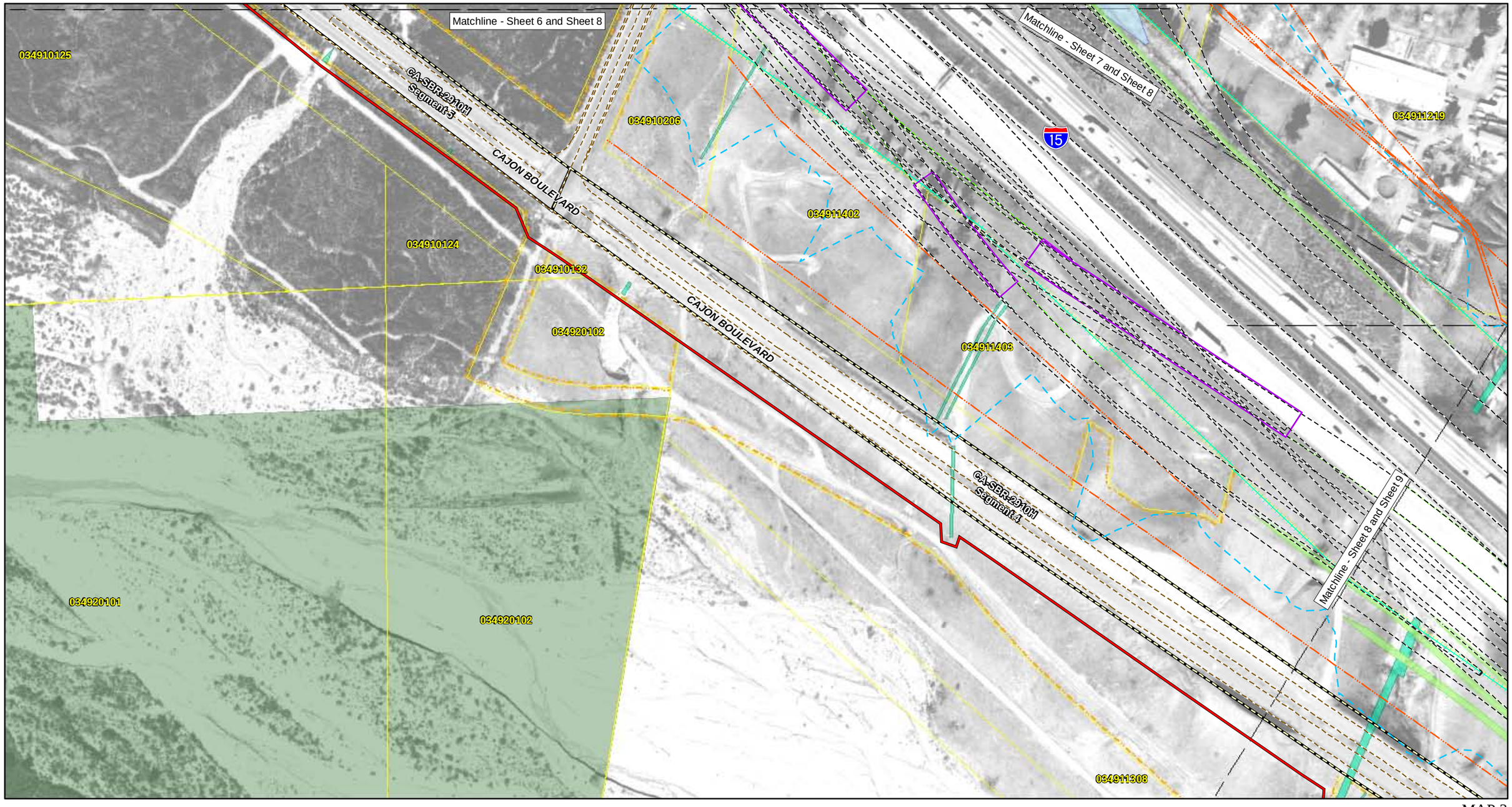
MAP 3
SHEET 7 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange
Improvements Project

Area of Potential Effects



N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
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- (#) Resources Evaluated
- Grading Limits
- Bioswale
- Detention Basin
- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map

SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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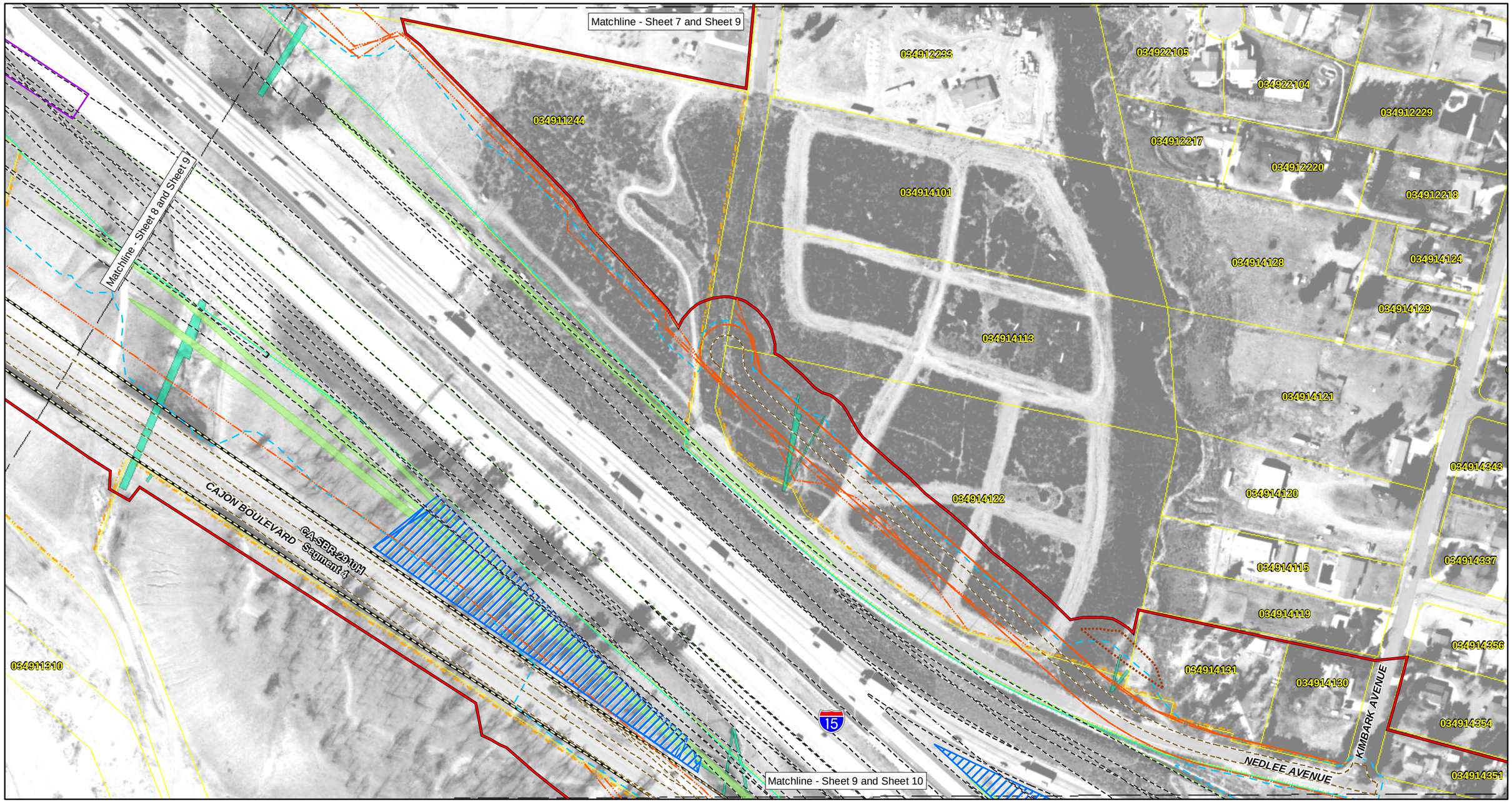
MAP 3
SHEET 8 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange Improvements Project

Area of Potential Effects



N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
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- (#) Resources Evaluated
- Grading Limits
- Bioswale
- Detention Basin
- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map

MAP 3

SHEET 9 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange Improvements Project

Area of Potential Effects

SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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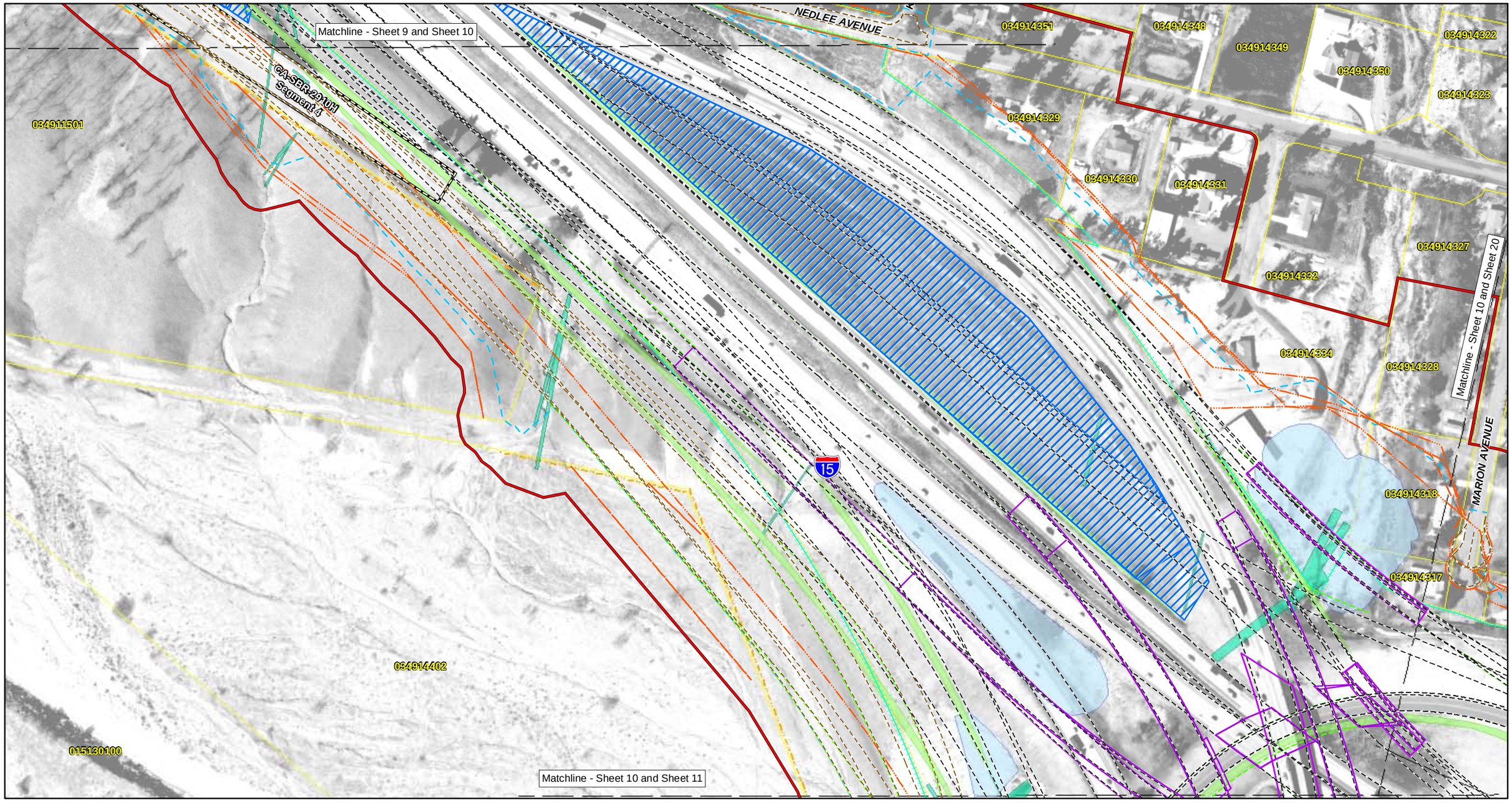

N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
- TCE
- Existing Local Agency ROW
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- Local Edge of Pavement
- Bridges
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- (#) Resources Evaluated
- Grading Limits
- Bioswale
- Detention Basin
- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map

SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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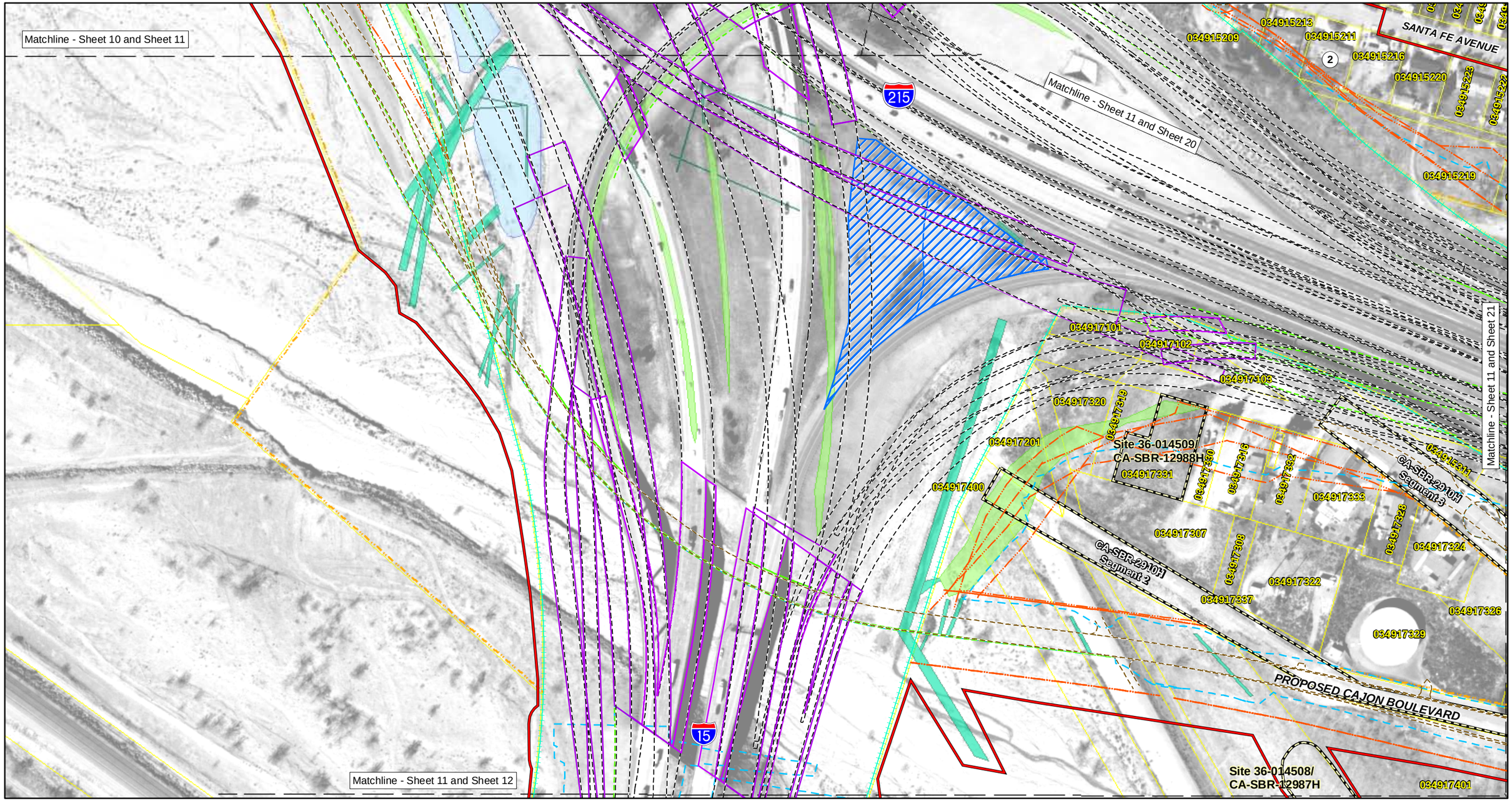
MAP 3
SHEET 10 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange Improvements Project

Area of Potential Effects



N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
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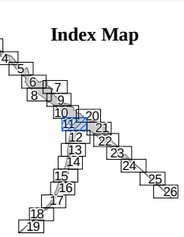
- (#) Resources Evaluated
- Grading Limits
- Bioswale
- Detention Basin
- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map



MAP 3
SHEET 11 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange
Improvements Project

Area of Potential Effects

SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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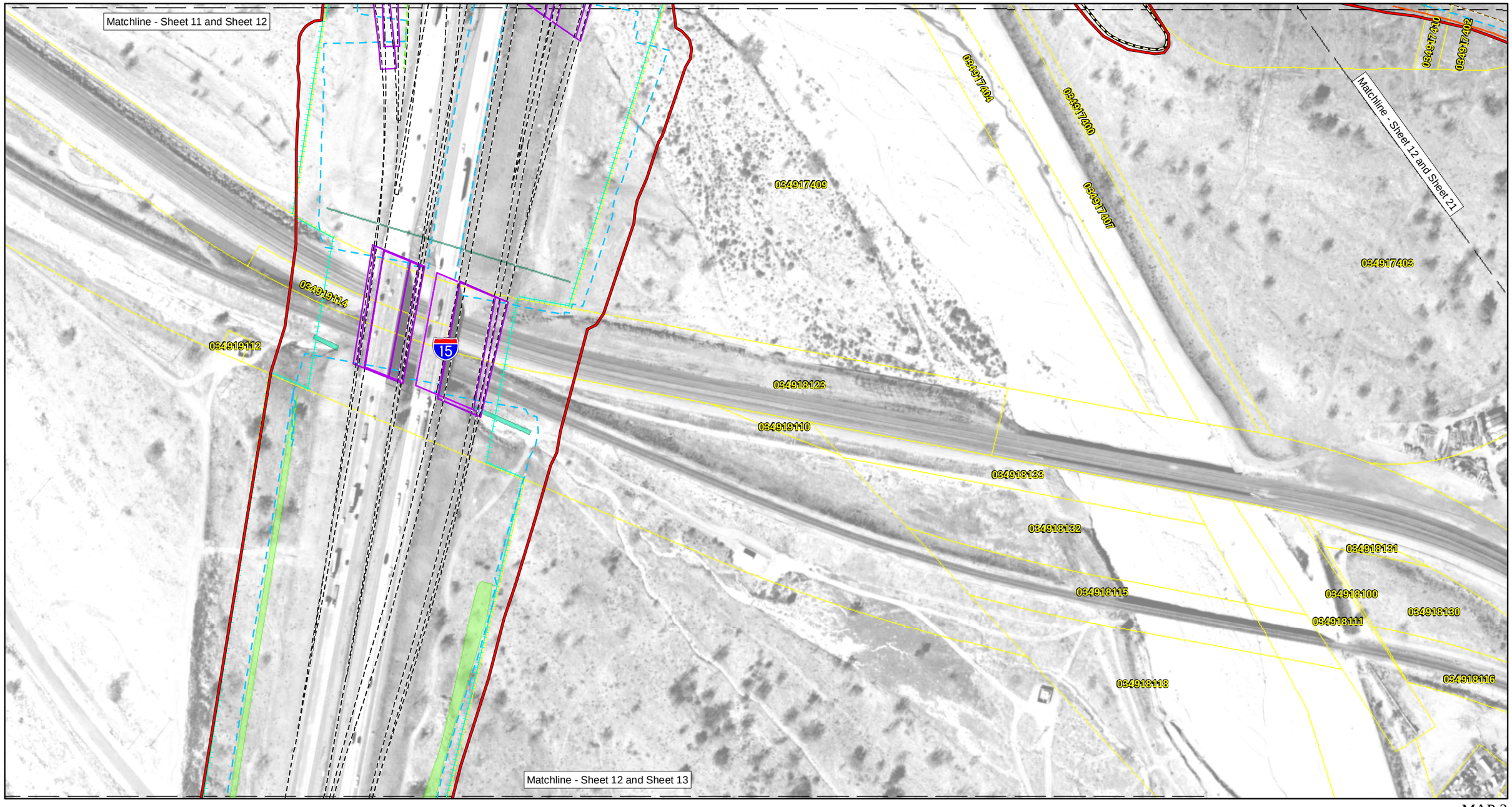

N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
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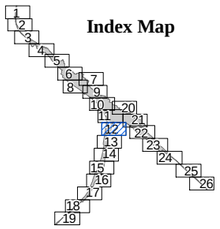
- Matchline
- Retaining Walls
- # Resources Evaluated
- Grading Limits
- Bioswale
- Detention Basin
- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map



SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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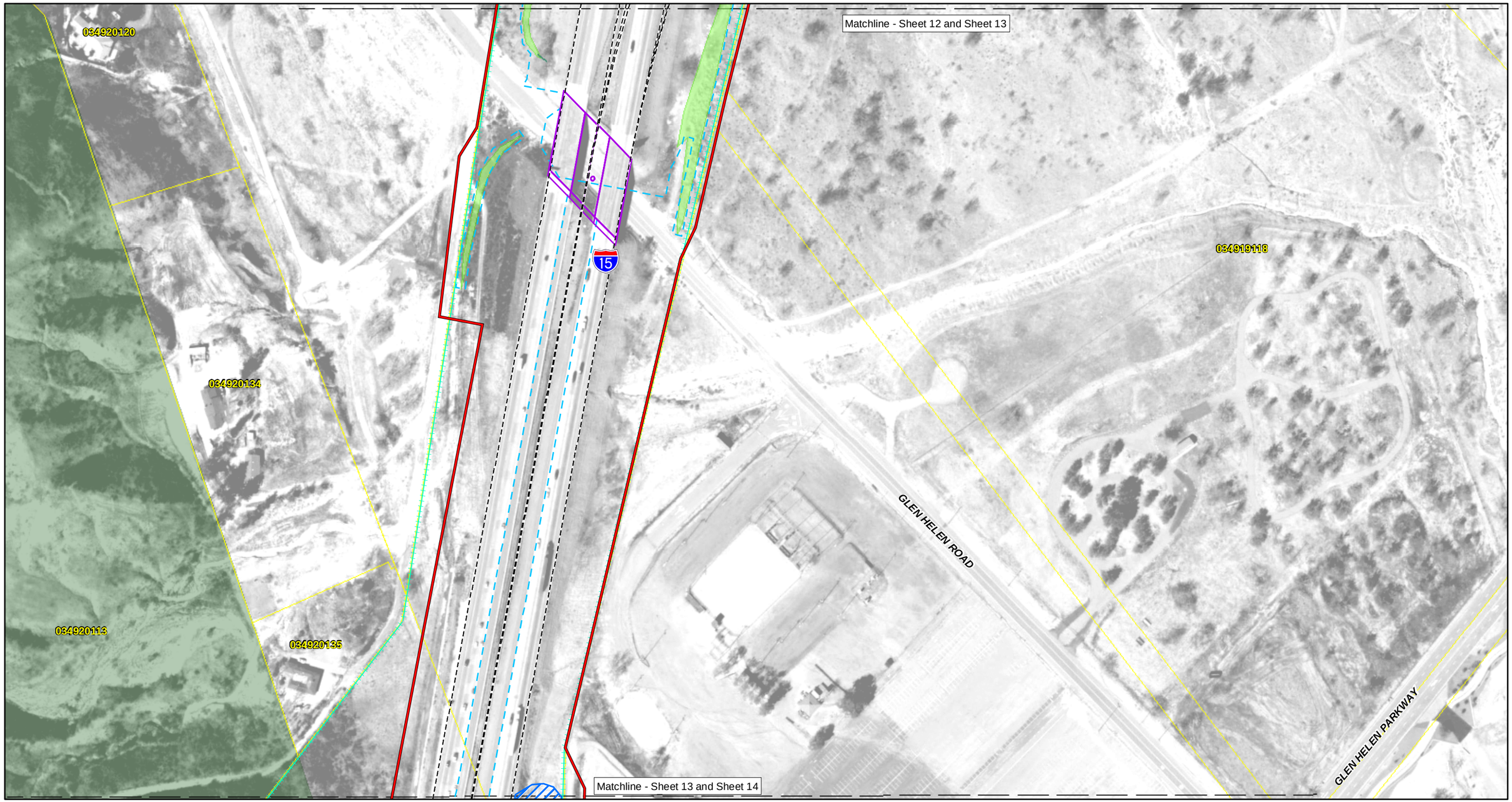
MAP 3
SHEET 12 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange Improvements Project

Area of Potential Effects



N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
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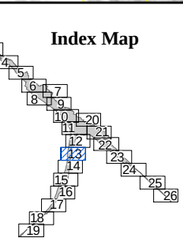
- Bioswale
- Detention Basin
- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map



MAP 3
SHEET 13 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange Improvements Project

Area of Potential Effects

SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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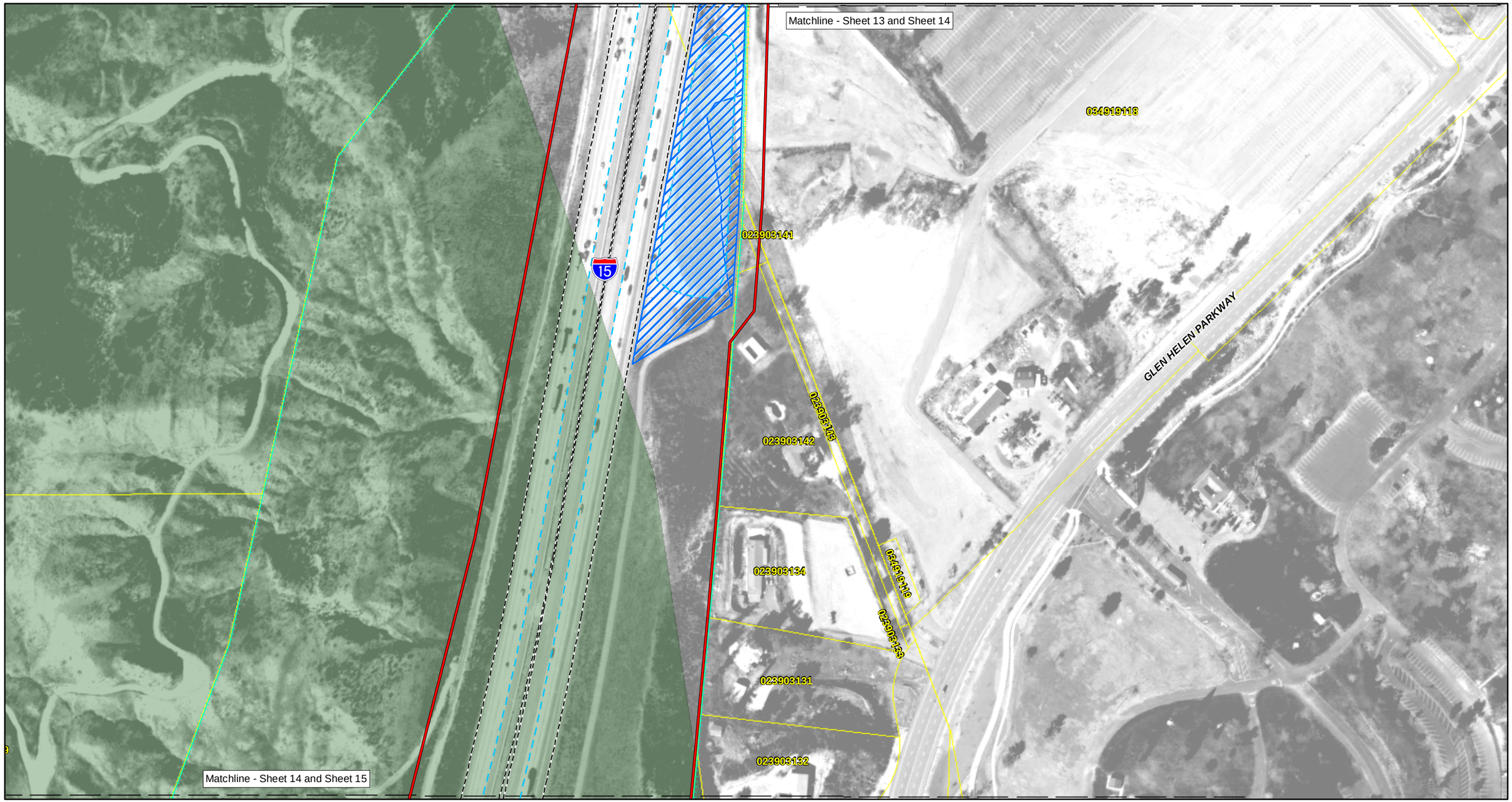

N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
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- Existing CalTrans ROW
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- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
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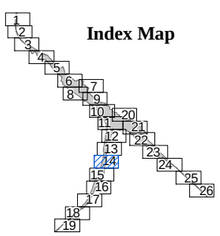
Index Map



SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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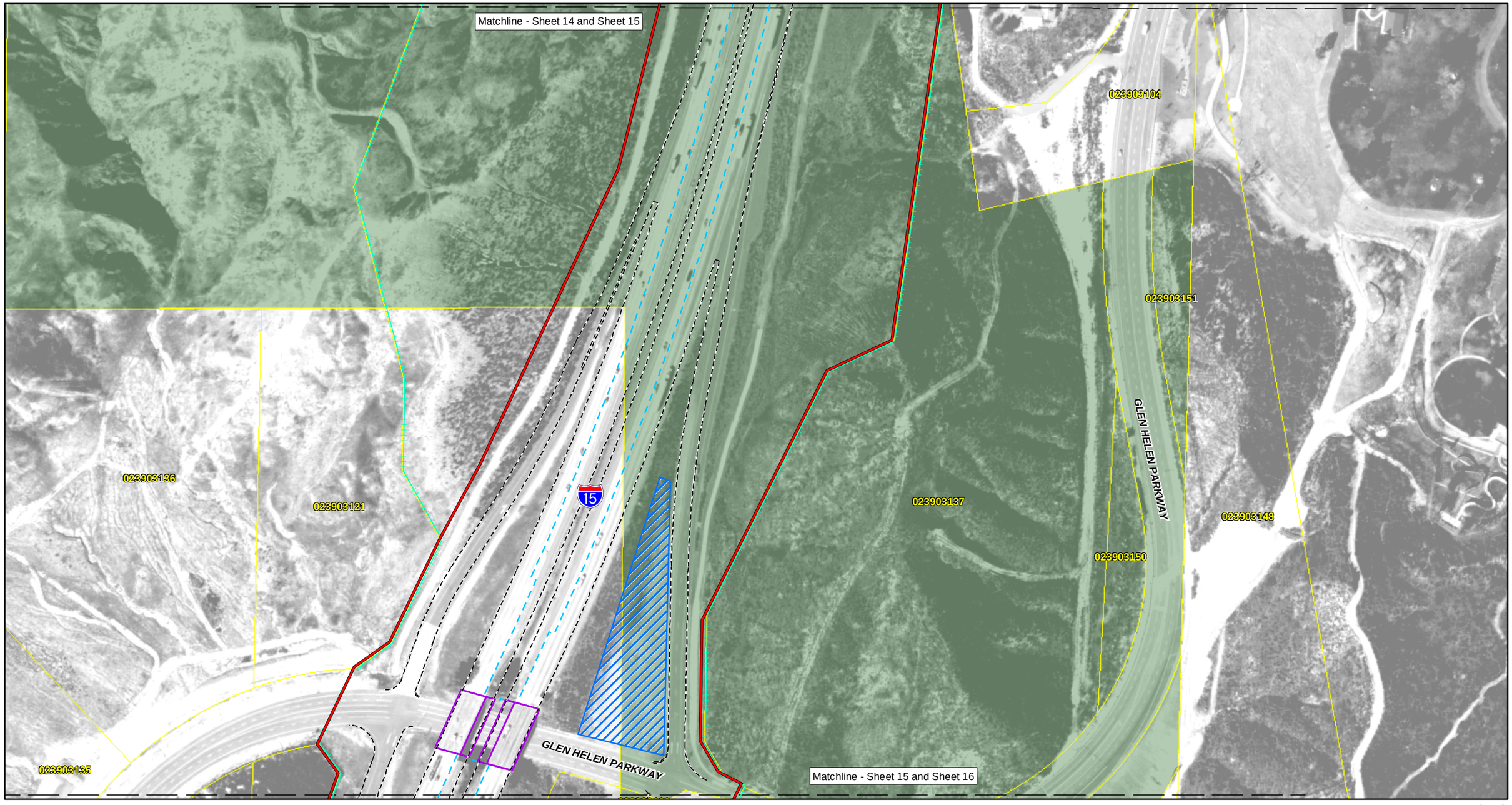
MAP 3
SHEET 14 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange
Improvements Project

Area of Potential Effects



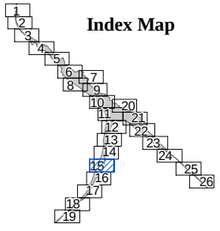
N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
- TCE
- Existing Local Agency ROW
- Freeway Edge of Pavement
- Local Edge of Pavement
- Bridges
- Matchline
- Retaining Walls
- (#) Resources Evaluated
- Grading Limits
- Bioswale
- Detention Basin
- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map



SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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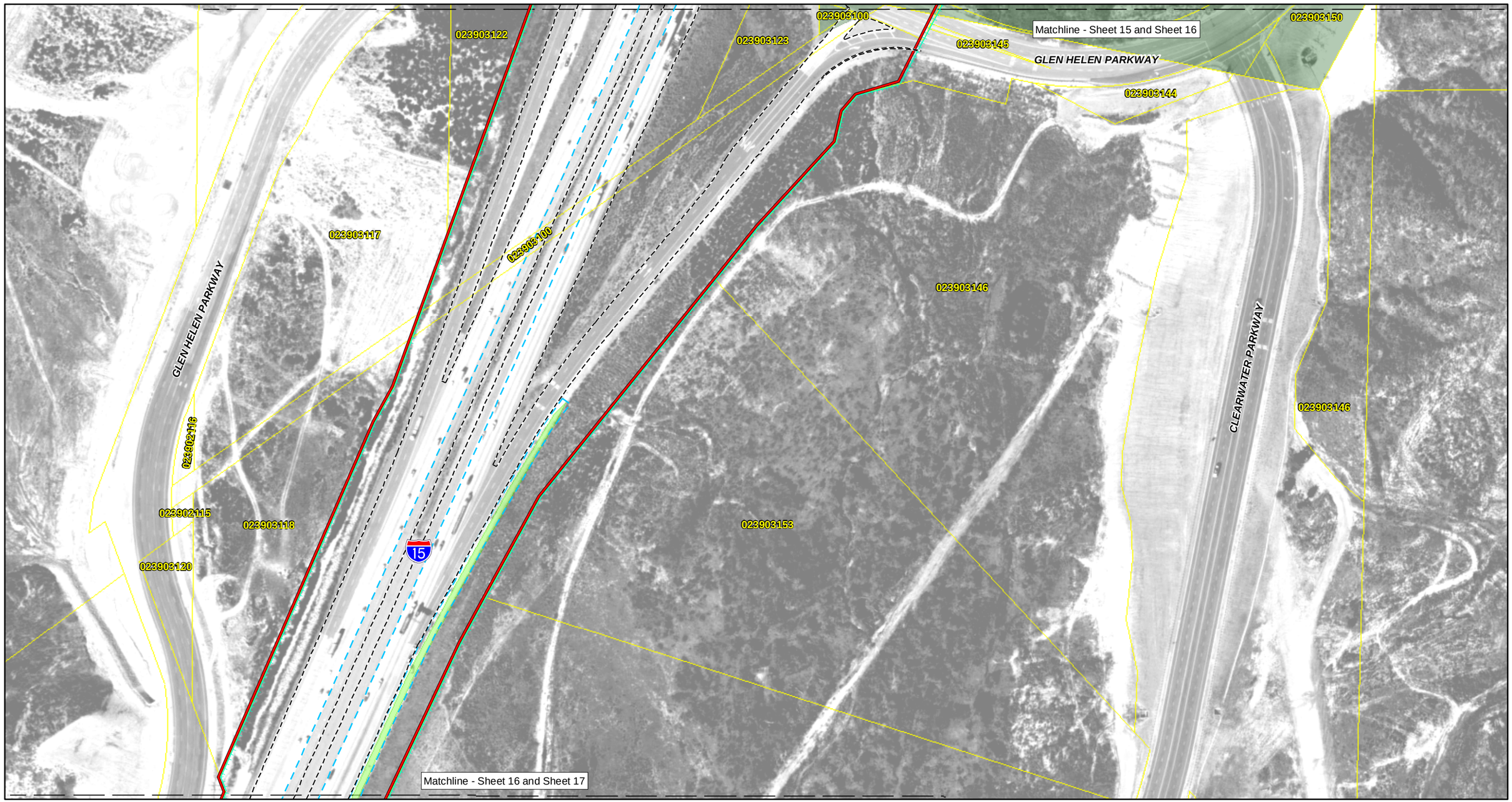
MAP 3
SHEET 15 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange Improvements Project

Area of Potential Effects



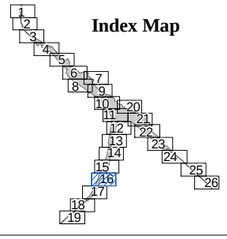
N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
- TCE
- Existing Local Agency ROW
- Freeway Edge of Pavement
- Local Edge of Pavement
- Bridges
- Matchline
- Retaining Walls
- (#) Resources Evaluated
- Grading Limits
- Bioswale
- Detention Basin
- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map



SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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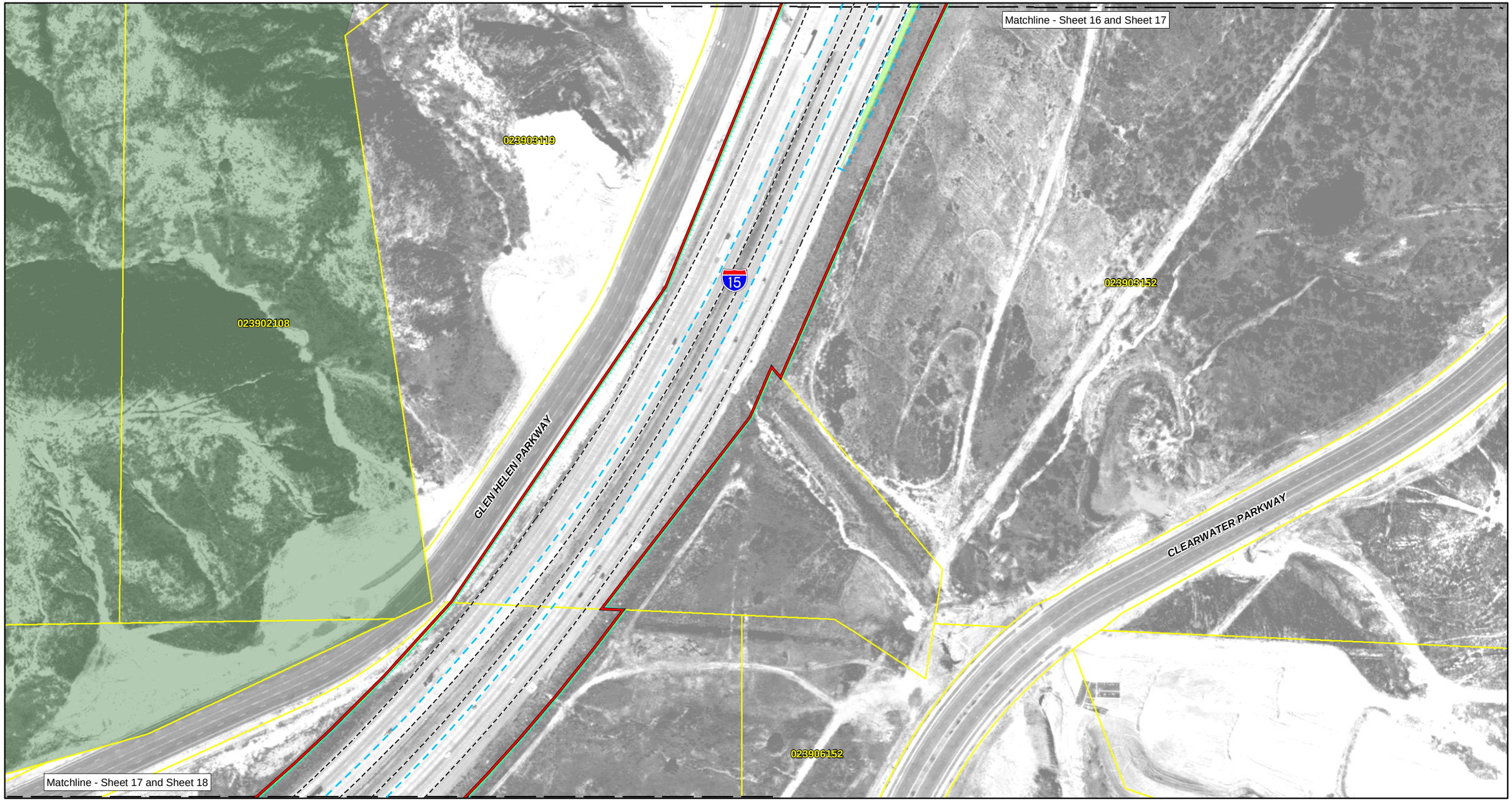
MAP 3
SHEET 16 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange Improvements Project

Area of Potential Effects



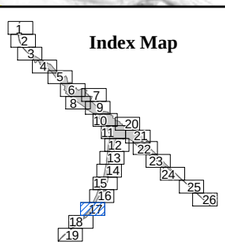
N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
- TCE
- Existing Local Agency ROW
- Freeway Edge of Pavement
- Local Edge of Pavement
- Bridges
- Matchline
- Retaining Walls
- (#) Resources Evaluated
- Grading Limits
- Bioswale
- Detention Basin
- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map



SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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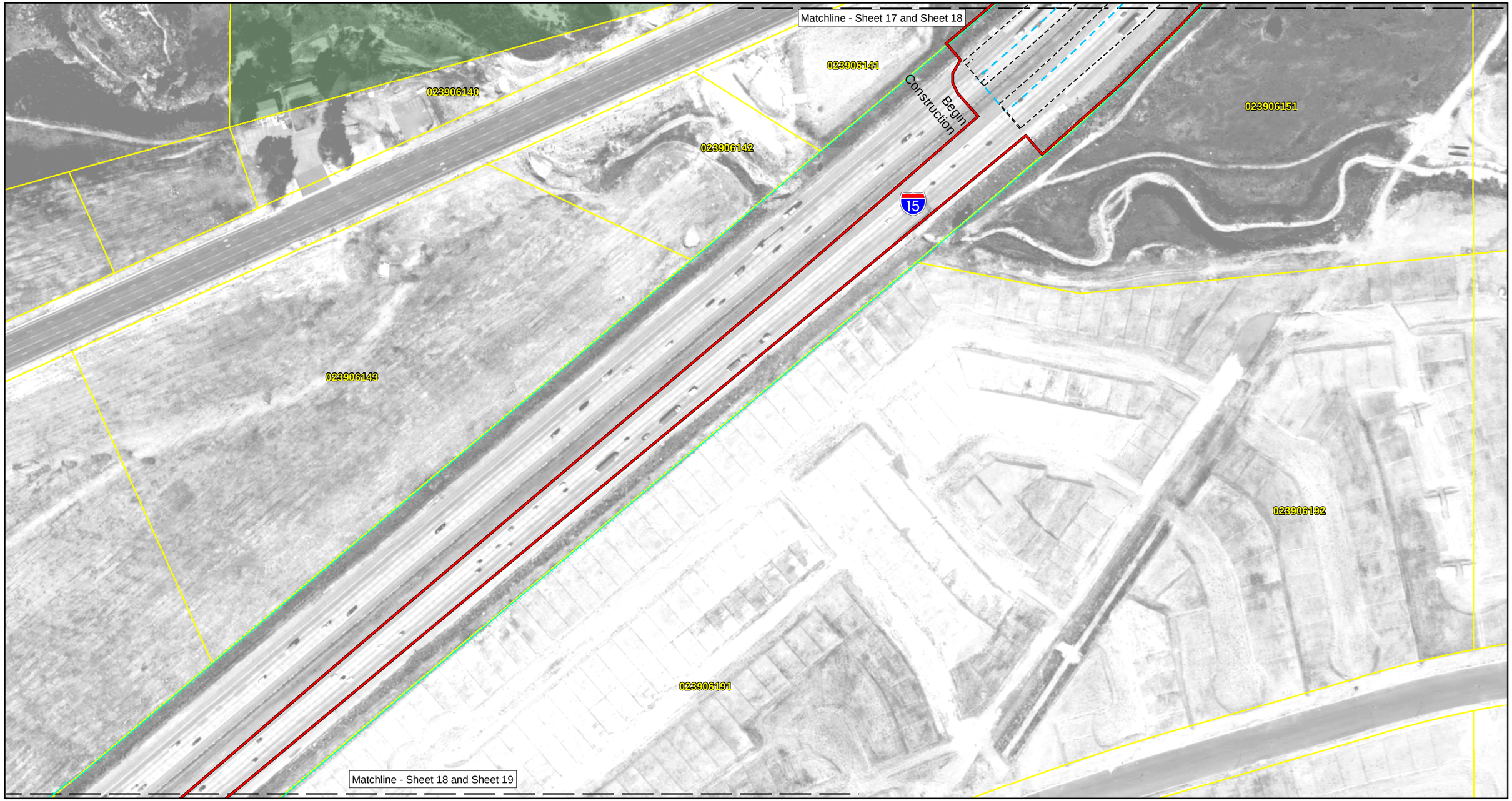
MAP 3
SHEET 17 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange
Improvements Project

Area of Potential Effects



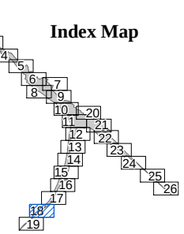
N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
- TCE
- Existing Local Agency ROW
- Freeway Edge of Pavement
- Local Edge of Pavement
- Bridges
- Matchline
- Retaining Walls
- (#) Resources Evaluated
- Grading Limits
- Bioswale
- Detention Basin
- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map



MAP 3
SHEET 18 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange Improvements Project

Area of Potential Effects

SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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Matchline - Sheet 18 and Sheet 19

Begin Advanced Signage

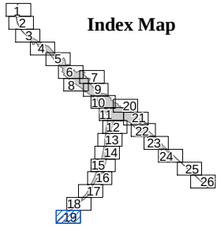
N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
- TCE
- Existing Local Agency ROW
- Freeway Edge of Pavement
- Local Edge of Pavement
- Bridges
- Matchline
- Retaining Walls
- # Resources Evaluated
- Grading Limits
- Bioswale
- Detention Basin
- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map



SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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MAP 3
SHEET 19 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange Improvements Project

Area of Potential Effects

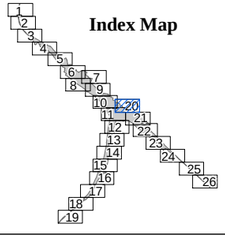
N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
- TCE
- Existing Local Agency ROW
- Freeway Edge of Pavement
- Local Edge of Pavement
- Bridges
- Matchline
- Retaining Walls
- (#) Resources Evaluated
- Grading Limits
- Bioswale
- Detention Basin
- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map



SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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MAP 3

SHEET 20 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange Improvements Project

Area of Potential Effects

Matchline - Sheet 11 and Sheet 21

Matchline - Sheet 20 and Sheet 21

034916402
3
034916411
034916413
034916414
034916415
034916600
034916620
034916621
034916607
034916618
034916617
034916616
034916615
034916614
034916619
034916611
034916612
034916613
034916609
034916610
034916604
034915310
034915413
034915412
034915403
034917311
8
034916907
034916906
034916900
034916902
034916908
034916904
034917410
034917402
034916303
4
034916905
034918206
034917403
034918209
034813106
034813107
034813103
034813201
034808105
215
CAJON BOULEVARD
DEVORE ROAD
CA-SBR-2910H Segment 3
CA-SBR-2910H Segment 2
CA-SBR-2910H Segment 1
GLEN HELEN PARKWAY/DEVORE ROAD
CABLE CANYON ROAD
Not A Part
Matchline - Sheet 12 and Sheet 21
Matchline - Sheet 21 and Sheet 22

N

0 100 200 FEET
0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
- TCE
- Existing Local Agency ROW
- Freeway Edge of Pavement
- Local Edge of Pavement
- Bridges
- Matchline
- Retaining Walls
- (#) Resources Evaluated
- Grading Limits
- Bioswale
- Detention Basin
- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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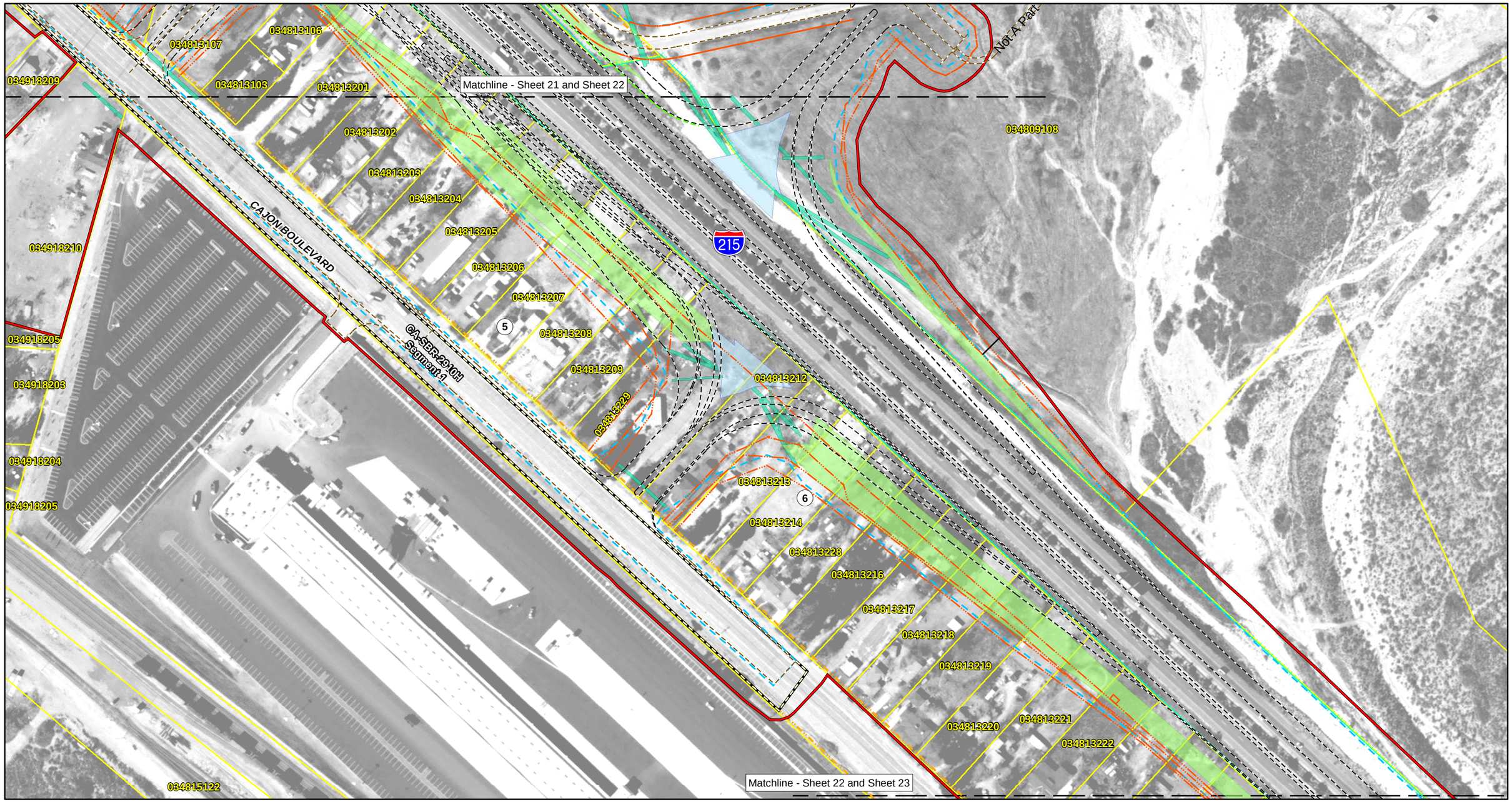
MAP 3
SHEET 21 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange Improvements Project

Area of Potential Effects



N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
- TCE
- Existing Local Agency ROW
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- (#) Resources Evaluated
- Grading Limits
- Bioswale
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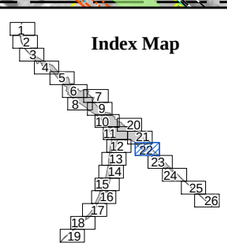
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map



MAP 3
SHEET 22 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange Improvements Project

Area of Potential Effects

SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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Matchline - Sheet 22 and Sheet 23

034813223
034813224
034813225
034814101
034814102
034814103
034814104
034814105
034814106
034814120
034814108
034814109
034814110
034814111
034814121
034814113
034814114
034814115
034814123
034814124
034814220
034814219
034814218
034814204
034809109
034809105
034809104
034814212
026201149

CAJON BOULEVARD

215

7

Matchline - Sheet 23 and Sheet 24

N

0 100 200 FEET
0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
- TCE
- Existing Local Agency ROW
- Freeway Edge of Pavement
- Local Edge of Pavement
- Bridges
- Matchline
- Retaining Walls
- (#) Resources Evaluated
- Grading Limits
- Bioswale
- Detention Basin
- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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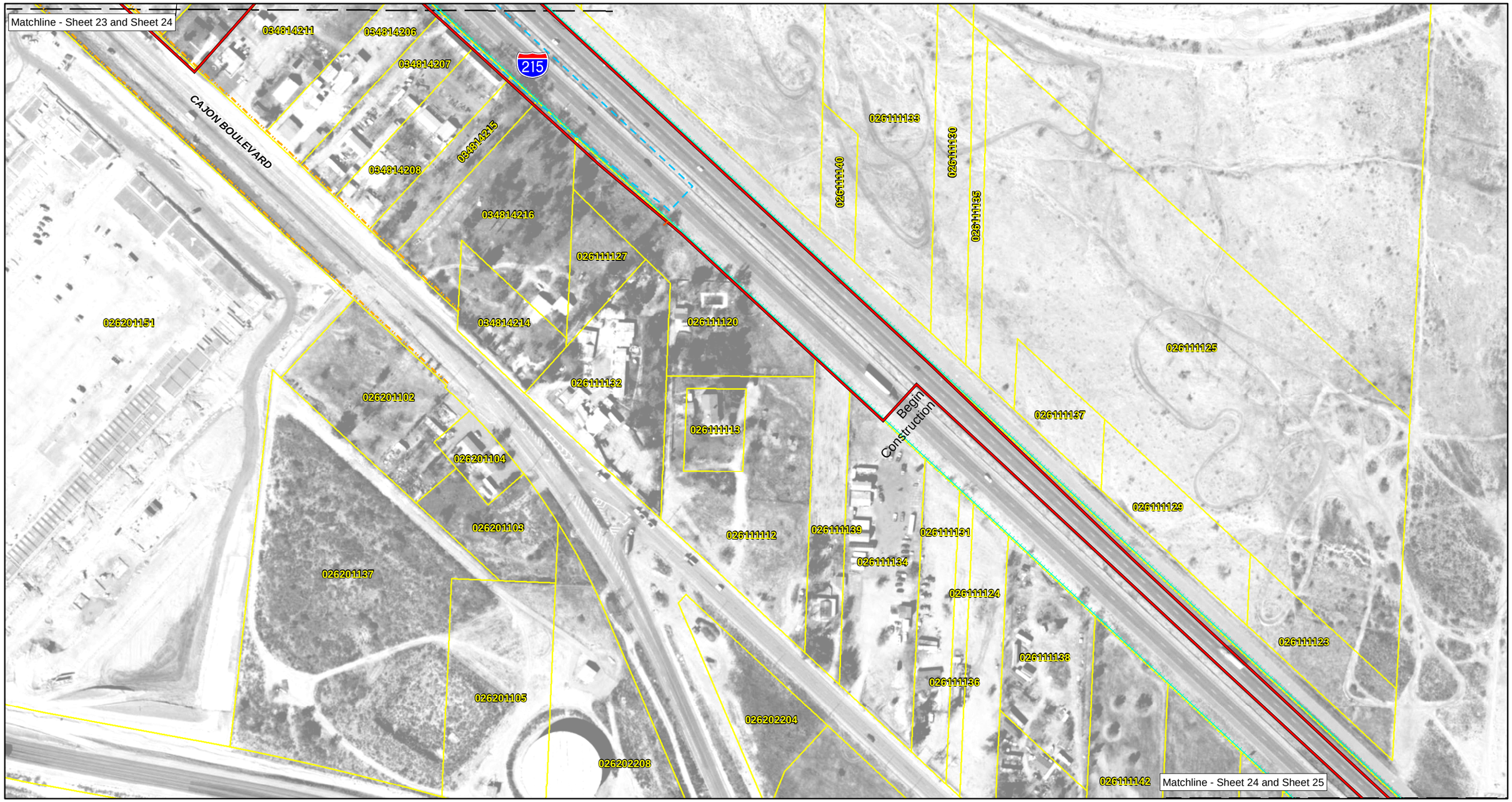
MAP 3
SHEET 23 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange Improvements Project

Area of Potential Effects



N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
- TCE
- Existing Local Agency ROW
- Freeway Edge of Pavement
- Local Edge of Pavement
- Bridges
- Matchline
- Retaining Walls
- (#) Resources Evaluated
- Grading Limits
- Bioswale
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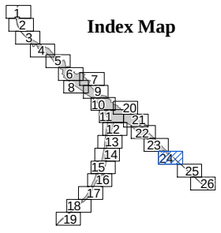
Index Map



MAP 3

SHEET 24 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange Improvements Project

Area of Potential Effects

SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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Matchline - Sheet 24 and Sheet 25

026111141

026111122

026111105

026111104

215

Matchline - Sheet 25 and Sheet 26

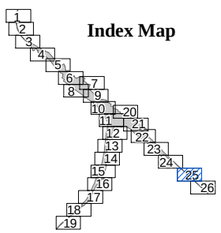
N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
- TCE
- Existing Local Agency ROW
- Freeway Edge of Pavement
- Local Edge of Pavement
- Bridges
- Matchline
- Retaining Walls
- (#) Resources Evaluated
- Grading Limits
- Bioswale
- Detention Basin
- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map



SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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MAP 3

SHEET 25 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange
Improvements Project

Area of Potential Effects

N

0 100 200 FEET

0 30.4 60.8 METERS

- Area of Potential Effects 09/01/10
- Parcel Boundaries
- Proposed ROW (Caltrans/Local)
- Existing CalTrans ROW
- TCE
- Existing Local Agency ROW
- Freeway Edge of Pavement
- Local Edge of Pavement
- Bridges
- Matchline
- Retaining Walls
- (#) Resources Evaluated
- Grading Limits
- Bioswale
- Detention Basin
- Drainage Improvements
- Potential Staging Area
- Resource Boundary
- Advanced Signage
- San Bernardino National Forest

Index Map

SOURCE: AirPhotoUSA, 2008; AECom, 2010.

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MAP 3
SHEET 26 OF 26

Project Number 0800000366
EA 08-0K7100 SBd 15/215
I-15 PM 13.0/R 17.4,
I-215 PM 15.0/18.8
I-15/I-215 Interchange
Improvements Project

Area of Potential Effects

EXHIBIT 4-C

Preliminary Site Investigation Report

DRAFT

PRELIMINARY SITE INVESTIGATION (PSI) REPORT
RAILROAD AREA HIGHWAY IMPROVEMENTS (PSI-4)
I-15/I-215 Interchange Improvements Project
San Bernardino County, California

Prepared for:
AECOM
901 Via Piemonte, 5th Floor
Ontario, California 91764

Prepared by:
Stantec Consulting Corporation
25864 Business Center Drive, Suite F
Redlands, California 92374

December 27, 2011

DRAFT

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1.2.2 Field Sampling Activities 2
1.2.3 Laboratory Analyses 2
1.3 PREVIOUS SITE INVESTIGATIONS 2

2.0 INVESTIGATION RESULTS 3

2.1 SUBSURFACE CONDITIONS 3
2.2 ANALYTICAL RESULTS 3
2.3 DATA VALIDATION 3

3.0 CONCLUSIONS AND RECOMMENDATIONS 4

4.0 CLOSURE 5

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Table 1 Summary of Soil Analytical Results

FIGURES

Figure 1 Site Location Map
Figure 2 Soil Sample Locations

APPENDICES

Appendix A Analytical Laboratory Reports and Chain-of-Custody Records

DRAFT

1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION AND OBJECTIVES

At the request of AECOM and pursuant to the scope of work outlined in the Preliminary Site Investigations Work Plan dated October 20, 2011, Stantec Consulting Corporation (Stantec) has prepared this report to present the results, findings and conclusions of a Preliminary Site Assessment (PSI) conducted to investigate potential recognized environmental concerns (RECs) identified within the proposed construction area of on railroad easement along sections of roadway/highway of the I-215/I-15 Interchange project in the Devore area of San Bernardino County, California (Figure 1).

According to site design plans, the construction of Alternative 3A will require procurement of new right-of-way (ROW) and expansion of freeway overpass encroaching on an existing railroad easement. As part of due diligence activities under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), this PSI was conducted to evaluate potential environmental concerns in the construction zone within the construction area on the Union Pacific (UP) and Burlington Northern Santa Fe (BNSF) railroad easement.

The railroad easement was identified as a REC in the following documents:

- Initial Site Assessment (ISA), prepared by LSA Associates, Inc., dated February 2010;
- Chapter 2.12.4 of the I-15/I-215 Interchange Improvements Project Initial Study/Environmental Assessment and Table 2.3-G (provided by AECOM, LSA, 2011);
- ADL and Environmental Site Assessment (ESA), prepared by Stantec, dated March 10, 2011; and the
- Alternative 3A Parcel Complexity Map (provided by AECOM),

The following sections describe the methodology, findings, and conclusions of the PSI performed to assess potential environmental concerns. Also included is a summary of field sampling activities, laboratory test results, and recommendations for soil management during construction activities.

1.2 SCOPE-OF-WORK

The scope of the PSI consisted of the following general elements:

- Pre-field project assessment and Health and Safety Plan (HASP) development,
- Field sampling activities, and
- Laboratory analysis.

1.2.1 Pre-Field Activities

Site plans provided by AECOM were reviewed and compared to actual field conditions during the site reconnaissance. From this preliminary site evaluation and through discussions with AECOM engineers, sample locations were designated on site plans to guide field investigation activities. In addition, a site-specific HASP was developed to guide field activities.

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1.2.2 Field Sampling Activities

The field methods used for this survey were consistent with those proposed in the work plan dated October 20, 2011. The proposed sampling locations at the railroad site were accessible and no deviations were necessary. Soil borings were advanced along the shoulders of the existing rail lines within the vicinity of the existing highway overpass structure.

Approximately 10 total borings were advanced along the railway lines located just beneath the Interstate-15 roadway structure in the area of proposed construction. Stantec staff worked with the railway flagmen to access the sampling locations in the project area. It is noted that samples were also collected in the area beneath the existing overpasses, in addition to the areas of the proposed overpass expansion. As a result, eighteen (18) total borings were advanced. However, only the samples from the ten (10) borings advanced in the area of the proposed construction were submitted for analysis. Refer to Figure 2 for the boring locations.

Two (2) samples were collected from each boring at depths of 0.5-1.0 and 1.5-2.0 feet bgs, or until refusal was achieved. At each location, soil samples were collected directly from the hand auger bailer, manually homogenized in the field, and discharged into glass jars with tight fitting caps and sealed with inert tape. All sample jars were labeled with a unique sample identification (ID) number, borehole ID, sample depth, sample date, and sample time. All samples were annotated on chain-of-custody forms and delivered to a laboratory certified by the California Department of Health Services Environmental Laboratory Accreditation Program (ELAP) for the analyses indicated herein.

Prior to sampling, all soil sampling equipment was decontaminated prior to sampling at each location using an Alconox scrub solution and followed by a tap water and deionized water double rinse.

1.2.3 Laboratory Analyses

Select soil samples were submitted under chain-of-custody to A & R Laboratories (A & R, formerly Microbac Laboratories). A & R is certified by the California Environmental Laboratory Accreditation Program (ELAP) to perform the laboratory tests required in this investigation. Samples were analyzed as follows:

- Title 22 Metals — EPA test method 6010B
- Polychorinated Biphenyls (PCBs) — EPA test method 8082
- Semi-volatile Organic Compounds (SVOCs) — EPA test method 8270

1.3 PREVIOUS SITE INVESTIGATIONS

Stantec is not aware of, and was not provided, any other environmental investigations associated with the recognized environmental concerns associated with the railway soils.

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2.0 INVESTIGATION RESULTS

2.1 SUBSURFACE CONDITIONS

The soils encountered during sampling were generally brown to brownish gray in color and consisted of medium-grained sands with silts, some clays and gravels. The soils were relatively dry in the soil column down to the maximum depth of approximately 2 feet bgs. No chemical odors or staining were reported in the soil samples. Groundwater was not encountered in any of the boreholes and not expected to be present in the upper 20 feet.

2.2 ANALYTICAL RESULTS

Copies of the laboratory reports and chain-of-custody forms are included in Appendix A. The analytical results are tabulated on Table 1 and summarized below:

- Seventeen (17) total samples from ten (10) borings (Figure 2) were submitted for Title 22 Metals, PCB, and SVOC analysis.
- Several metals analytes were reported above laboratory reporting limits in soil samples. Table 1 compares project sample data with the background statistical data from studies performed for the California Department of Toxic Substances Control (DTSC) in 1991 (Marret et al, April 1991). Based on this comparison it appears that the reported metals concentrations are consistent with expected background concentrations.
- Arsenic (ranging from 1.10 to 1.44 mg/kg) was reported in samples to depths of at least 1 to 2 feet bgs in three (3) of the ten (10) borings advanced along the railway. These concentrations are slightly above the California Human Health Screening Level, but well within the expected background concentrations.
- PCB and SVOC analytes were not reported above the laboratory reporting limits in all samples.

2.3 DATA VALIDATION

Prior to submitting soil samples to the laboratory, the chain-of-custody documentation was reviewed for accuracy and completeness. The laboratory reports were cross checked with the chain-of-custody forms to confirm accurate transposing of sample information. Laboratory quality assurance and quality control (QA/QC) data (method blanks, laboratory control samples and duplicates, matrix spike samples and duplicates) were also reviewed for compliance with QA/QC objectives. Based on this validation process, the quality of the data contained herein are adequate for the purposes of this study. Laboratory quality control data are attached in Appendix A.

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3.0 CONCLUSIONS AND RECOMMENDATIONS

A PSI was conducted to evaluate potential environmental concerns or conditions within the proposed construction zone of overpass expansion within the railroad right-of-way. Soil sample analytical results indicate that Title 22 metals were reported at concentrations consistent with those expected in background for southern California. PCBs and SVOCs were not reported above laboratory reporting limits.

Based on these results, it appears that no further actions are necessary with respect to potential environmental concerns in the construction zone in the railroad ROW. However, Stantec recommends that excess soil from the railroad ROW not be used on residential or other sensitive use (i.e.; day care) properties.

Other than the actions recommended above, no other investigation or remediation appears warranted at this time. Given the history of the Site, undiscovered or unknown environmental conditions may be encountered during grading and development of the proposed project. If encountered, additional investigations and removal actions may be required at that time.

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4.0 CLOSURE

The conclusions and recommendations contained in this report/assessment are based upon professional opinions with regard to the subject matter. These opinions have been arrived at in accordance with currently accepted engineering standards and practices applicable to this location and are subject to the following inherent limitations:

The data and findings presented in this report are valid as of the dates when the investigations were performed. The passage of time, manifestation of latent conditions or occurrence of future events may require further exploration at the site, analysis of the data, and reevaluation of the findings, observations, and conclusions expressed in the report.

The data reported and the findings, observations, and conclusions expressed in the report are limited by the Scope of Work outlined in the Work Plan dated October 20, 2011.

Unless otherwise stated in the report, because of the limitations stated above, the findings, observations, and conclusions expressed in this report are not, and should not be, considered an opinion concerning the compliance of any past or present owner or operator of the site with any federal, state or local law or regulation.

No warranty or guarantee, whether express or implied, is made with respect to the data or the reported findings, observations, and conclusions, all of which, however, accurately reflect site conditions in existence at the time of investigation.

This report presents professional opinions and findings of a scientific and technical nature. While attempts were made to relate the data and findings to applicable environmental laws and regulations, the report shall not be construed to offer legal opinion as to the requirements of, nor compliance with, environmental laws, rules, regulations or policies of federal, state or local governmental agencies. Any use constitutes acceptance of the limits of liability. The report preparer's liability extends only to those parties contracted to complete this project and not to any other parties who may obtain the Report. Issues raised by the report should be reviewed by appropriate legal counsel.

This report is based, in part, on unverified information supplied to the report preparer by third-party sources. While efforts have been made to substantiate this third-party information, the report preparer cannot guarantee its completeness or accuracy..

DRAFT

5.0 LIST OF PREPARERS

This PSI report has been prepared under the direction of the following environmental professionals.

Preparers:

- Kevin K. Miskin, P.E.
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  PSI Investigation Report Senior Reviewer

- Anne Perez
  Stantec
  M.S., Geology, University of California, Riverside, California
  PSI Investigation Report Reviewer, Task Manager

If you have any questions or comments regarding the information enclosed herein, please contact the undersigned at your convenience.

Respectfully submitted,
Stantec Consulting Corporation

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TABLES

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TABLE 1
Summary of Soil Analytical Results
Railroad Area Highway Improvements (PSI-4)
I-15/I-215 Interchange Improvements Project

Sample ID[1]	Sample Depth	Antimony mg/kg	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Cadmium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Lead mg/kg	Molybdenum mg/kg	Nickel mg/kg	Selenium mg/kg	Silver mg/kg	Thallium mg/kg	Vanadium mg/kg	Zinc mg/kg	Mercury (mg/kg)	PCBs	SVOCs
EPA REGIONAL SCREENING LEVELS[2]		31	1.6	5400	150	37	210	900	3100	150	390	1600	390	390	5.2	78	23,000		NA	NA
CALIFORNIA HUMAN HEALTH SCREENING LEVELS[3]		30	0.07	5200	150	1.7	NE	660	3000	150	380	1600	380	380	5	530	23,000		NA	NA
BACKGROUND CONCENTRATIONS[4]		Not establilshed	0.6-11.0	133-1400	0.25-2.70	0.05-1.70	23-1579	2.7-46.9	9.1-96.4	12.4-97.1	0.1-9.6	9-509	0.015-0.430	13.2-39.4	9.8-36.2	75-288	133-236	0.05-0.90	NA	NA
Devore Interchange - HAND AUGER SAMPLES																				
HA-3	0.5-1	<1.00	**1.44**	**45.9**	<0.500	<0.500	**16**	**10.7**	**51.8**	**27.5**	**1.35**	**56.1**	<1.00	<1.00	<1.00	**16.9**	**94.1**	<0.0200	ALL ND	ALL ND
	1.5-2	<1.00	<1.00	**31.3**	<0.500	<0.500	**9.79**	**8.56**	**23.9**	**11.10**	<0.500	**44.9**	<1.00	<1.00	<1.00	**14.6**	**39.4**	<0.0200	ALL ND	ALL ND
HA-8	0.5-1	<1.00	<1.00	**16.3**	<0.500	<0.500	**12.4**	**19.5**	**56.5**	<0.500	<0.500	**105**	<1.00	<1.00	<1.00	**22.7**	**22.6**	<0.0200	ALL ND	ALL ND
	1.5-2	<1.00	<1.00	**17.2**	<0.500	<0.500	**14.8**	**20.3**	**58.8**	<0.500	<0.500	**117**	<1.00	<1.00	<1.00	**22.4**	**22.7**	<0.0200	ALL ND	ALL ND
HA-11	0.5-1	<1.00	<1.00	**37.2**	<0.500	<0.500	**9.77**	**6.74**	**22.9**	**11.4**	<0.500	**32.1**	<1.00	<1.00	<1.00	**14.5**	**40.8**	**0.067**	ALL ND	ALL ND
	1.5-2	<1.00	**1.36**	**77.8**	<0.500	<0.500	**13.4**	**7.71**	**52.7**	**28.3**	**1.81**	**34.5**	<1.00	<1.00	<1.00	**18.2**	**74.9**	<0.0200	ALL ND	ALL ND
HA-12	0.5-1	<1.00	<1.00	**18.5**	<0.500	<0.500	**14.2**	**17.8**	**50.9**	**0.666**	<0.500	**91.2**	<1.00	<1.00	<1.00	**22.0**	**21.1**	<0.0200	ALL ND	ALL ND
	1.5-2	<1.00	<1.00	**19.6**	<0.500	<0.500	**11.5**	**16.3**	**48.8**	**0.528**	<0.500	**80.5**	<1.00	<1.00	<1.00	**21.6**	**20.9**	<0.0200	ALL ND	ALL ND
HA-13	0.5-1	<1.00	<1.00	**19.4**	<0.500	<0.500	**10.9**	**15.9**	**46.6**	**6.96**	<0.500	**87.4**	<1.00	<1.00	<1.00	**14.4**	**29.0**	**0.229**	ALL ND	ALL ND
	1.5-2	<1.00	<1.00	**39.1**	<0.500	<0.500	**17.4**	**12.8**	**48.3**	**24.9**	<0.500	**64.3**	<1.00	<1.00	<1.00	**18.0**	**44.8**	**0.199**	ALL ND	ALL ND
HA-14	0.5-1	<1.00	<1.00	**40.9**	<0.500	<0.500	**12.7**	**13.8**	**46.6**	**30.10**	<0.500	**67.3**	<1.00	<1.00	<1.00	**20.2**	**53.4**	**0.151**	ALL ND	ALL ND
	1.5-2	<1.00	<1.00	**24.9**	<0.500	<0.500	**7.29**	**7.28**	**16.5**	**2.95**	<0.500	**33.8**	<1.00	<1.00	<1.00	**13.3**	**20.3**	**0.134**	ALL ND	ALL ND
HA-15	0.5-1	<1.00	<1.00	**56.3**	<0.500	**0.500**	**15.6**	**14.5**	**60.1**	**51.0**	<0.500	**76.9**	<1.00	<1.00	<1.00	**20.5**	**85.2**	**0.188**	ALL ND	ALL ND
	1.5-2	<1.00	<1.00	**22.3**	<0.500	<0.500	**12.6**	**13.6**	**32.9**	**1.70**	<0.500	**71.3**	<1.00	<1.00	<1.00	**14.5**	**25.3**	**0.182**	ALL ND	ALL ND
HA-16*	0.5-1	<1.00	<1.00	**56.2**	<0.500	<0.500	**12.6**	**4.69**	**11.5**	**3.30**	<0.500	**8.01**	<1.00	<1.00	<1.00	**21.8**	**22.8**	**0.186**	ALL ND	ALL ND
HA-17*	0.5-1	<1.00	**1.10**	**48.8**	<0.500	<0.500	**7.29**	**4.38**	**10.2**	**2.26**	<0.500	**6.88**	<1.00	<1.00	<1.00	**18.9**	**21.9**	**0.174**	ALL ND	ALL ND
HA-18*	0.5-1	<1.00	<1.00	**41.9**	<0.500	<0.500	**6.20**	**4.45**	**8.75**	**2.21**	<0.500	**6.18**	<1.00	<1.00	<1.00	**18.0**	**21.7**	**0.245**	ALL ND	ALL ND

NOTES:

[1]Sample ID indicates borehole location followed by sample collection depth in feet

[2]United States Environmental Protection Agency Regional Screening Levels - dated December 2009

[3]California EPA California Human Health Screening Levels - dated January 2005

[4]Marrett, D.J., A.L. Page, G.R. Bradford, D. Bakhtar, R.C. Graham, A.C. Chang, Background Levels of Soil Trace Elements in Southern California Soils, April, 1991

<0.5 - Analyte not reported at or above stated detection limit

All samples were collected 11/15/2011

* Indicates refusal at 1-foot in boring

Shading indicates a sample reporting a concentration that exceeds the regulatory background levels.

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FIGURES

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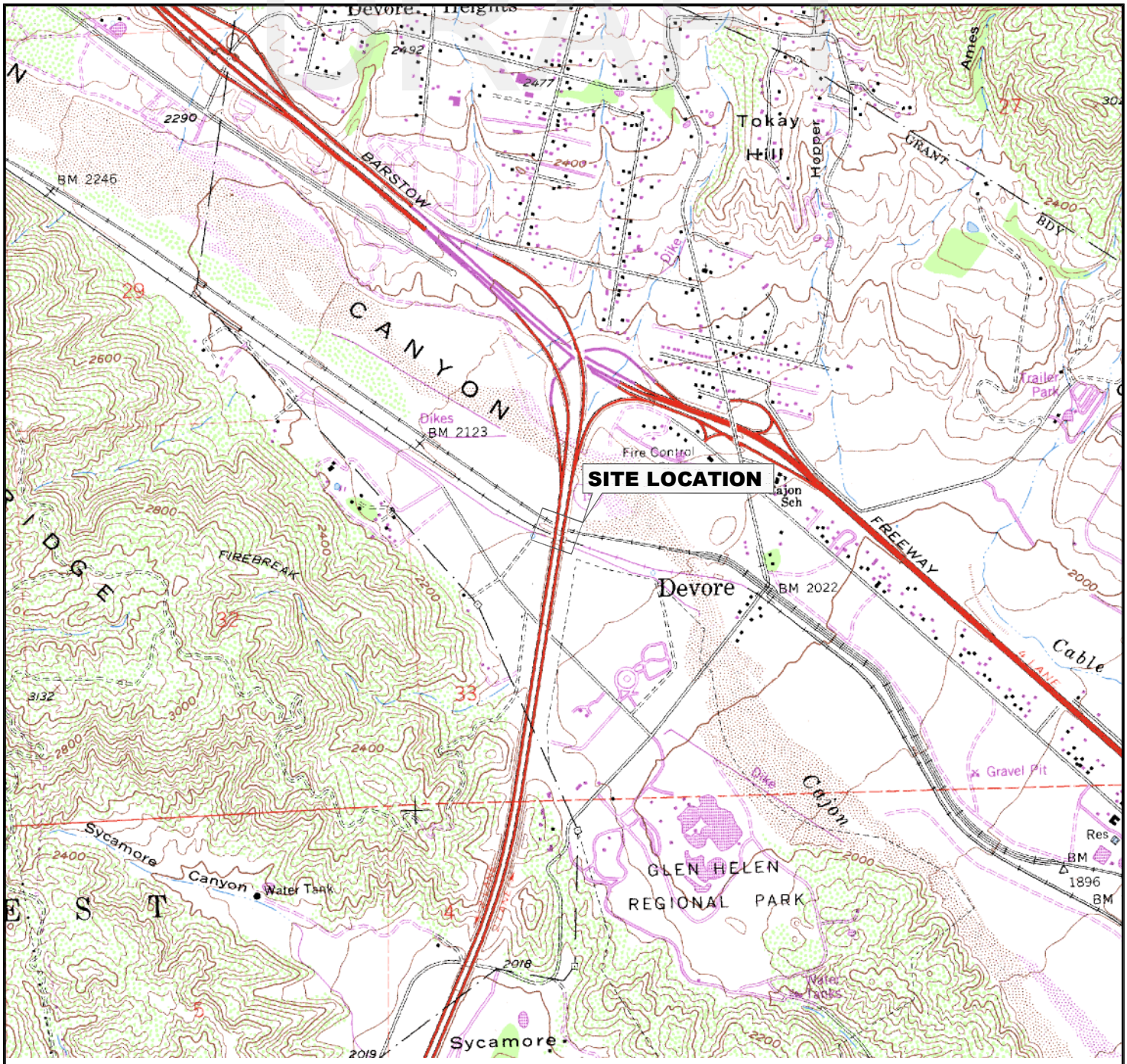

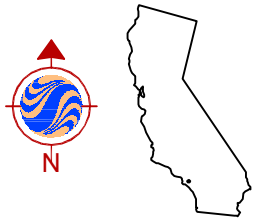

CALIFORNIA

1 1/2 0 1

SCALE IN MILE

1000 0 1000 2000 3000 4000 5000 6000 7000

SCALE IN FEET

REFERENCE: CA Digital Raster Graphics(http://gis.ca.gov/casil/usgs.gov/)
7.5 Minute Series, Albers NAD83, Trimmed
Block o33117e8 & o33117g8, Downloaded 5/14/10

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Stantec
25864-F BUSINESS CENTER DRIVE
REDLANDS, CALIFORNIA 92374
PHONE:(909) 335-6116 FAX:(909) 556-6516

FOR:
AECOM
901 VIA PIEMONTE
5th FLOOR
ONTARIO, CALIFORNIA 91764

RAILROAD RIGHT-OF-WAY (PSI-4)

FIGURE: 1

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185802352	J. RESENDIZ	A. PEREZ		DEC. 2011

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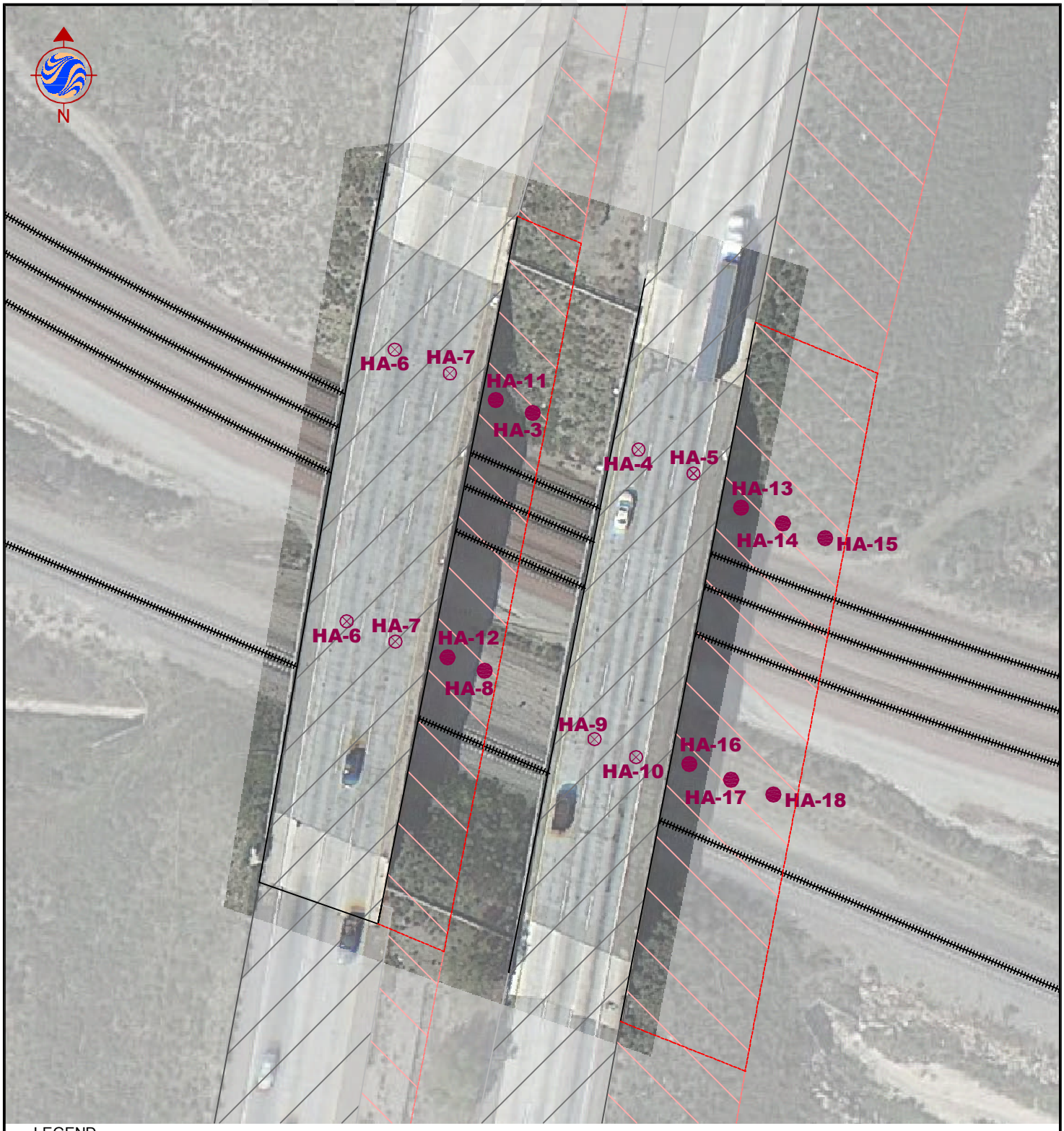

LEGEND

- BORING LOCATIONS
- ALTERNATIVE BORING LOCATIONS
- EXISTING HIGHWAY

0 60 120

APPROXIMATE SCALE IN FEET

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AECOM
901 VIA PIEMONTE
5th FLOOR
ONTARIO, CALIFORNIA 91764

RAILROAD RIGHT-OF-WAY (PSI-4)

FIGURE: 2

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185802352	J. RESENDIZ	A. PEREZ		DEC. 2011

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APPENDIX A
ANALYTICAL LABORATORY REPORTS AND CHAIN-OF-CUSTODY RECORDS

A & R Laboratories
Formerly Microbac Southern California
1401 RESEARCH PARK DRIVE, SUITE 100
RIVERSIDE CA, 92507
951-779-0310 FAX 951-779-0344
www.arlaboratories.com office@arlaboratories.com

FDA#	2030513
LA City#	10261
ELAP#'s	2789
	2790
	2122

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FOOD · COSMETICS · WATER · SOIL · SOIL VAPOR · WASTES

CASE NARRATIVE

Authorized Signature Name / Title (print)	Ken Zheng, President
Signature / Date	Ken Zheng, President 11/22/2011 11:52:04
Laboratory Job No. (Certificate of Analysis No.)	1111-00116
Project Name / No.	AECOM-DEVORE INTERCHANGE
Dates Sampled (from/to)	11/15/11 To 11/15/11
Dates Received (from/to)	11/16/11 To 11/16/11
Dates Reported (from/to)	11/22/11 To 11/22/2011
Chains of Custody Received	Yes

Comments:

Subcontracting

Organic Analyses

No analyses sub-contracted

Inorganic Analyses

No analyses sub-contracted

Sample Condition(s)

All samples intact

Positive Results (Organic Compounds)

None

The data and information on this, and other accompanying documents, represent only the sample(s) analyzed and is rendered upon condition that it is not to be reproduced, wholly or in part, for advertising or other purposes without approval from the laboratory.

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FOOD · COSMETICS · WATER · SOIL · SOIL VAPOR · WASTES

CERTIFICATE OF ANALYSIS

1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 001 **EBQC-1**					Date & Time Sampled:		11/15/11 @ 9:15	
Sample Matrix: **Aqueous**								
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3010A	2		11/16/11	TLB
Antimony	<0.0200		mg/L	EPA 6010B	1	0.0200	11/17/11	TLB
Arsenic	<0.0200		mg/L	EPA 6010B	1	0.0200	11/17/11	TLB
Barium	<0.0100		mg/L	EPA 6010B	1	0.0100	11/17/11	TLB
Beryllium	<0.00500		mg/L	EPA 6010B	1	0.00500	11/17/11	TLB
Cadmium	<0.00500		mg/L	EPA 6010B	1	0.00500	11/17/11	TLB
Chromium	<0.0100		mg/L	EPA 6010B	1	0.0100	11/17/11	TLB
Cobalt	<0.00500		mg/L	EPA 6010B	1	0.00500	11/17/11	TLB
Copper	<0.0100		mg/L	EPA 6010B	1	0.0100	11/17/11	TLB
Lead	<0.0200		mg/L	EPA 6010B	1	0.0200	11/17/11	TLB
Molybdenum	<0.0200		mg/L	EPA 6010B	2	0.0200	11/16/11	TLB
Nickel	<0.0100		mg/L	EPA 6010B	1	0.0100	11/17/11	TLB
Selenium	<0.0200		mg/L	EPA 6010B	1	0.0200	11/17/11	TLB
Silver	<0.0400		mg/L	EPA 6010B	2	0.0400	11/16/11	TLB
Thallium	<0.100		mg/L	EPA 6010B	1	0.100	11/17/11	TLB
Vanadium	<0.0100		mg/L	EPA 6010B	1	0.0100	11/17/11	TLB
Zinc	<0.0400		mg/L	EPA 6010B	1	0.0400	11/17/11	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7470A	1		11/16/11	KZ
Mercury	<0.000200		mg/L	EPA 7470A	1	0.000200	11/16/11	KZ
[Semi-Volatile Organics]								
Sep Funnel LLE	Complete			EPA 3510C	1		11/19/11	KZ
bis(2-Chloroethyl) ether	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Phenol	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
2-Chlorophenol	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
1,3-Dichlorobenzene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
1,4-Dichlorobenzene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
1,2-Dichlorobenzene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
bis(2-Chloroisopropyl)ether	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Hexachloroethane	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
n-Nitrosodi-n-Propylamine	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ

The data and information on this, and other accompanying documents, represent only the sample(s) analyzed and is rendered upon condition that it is not to be reproduced, wholly or in part, for advertising or other purposes without approval from the laboratory.

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FOOD · COSMETICS · WATER · SOIL · SOIL VAPOR · WASTES

CERTIFICATE OF ANALYSIS

1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 001 **EBQC-1** Date & Time Sampled: 11/15/11 @ 9:15
Sample Matrix: **Aqueous**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Nitrobenzene	<0.0030		mg/L	EPA 8270C	1	0.0030	11/19/11	KZ
Isophorone	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
2-Nitrophenol	<0.0040		mg/L	EPA 8270C	1	0.0040	11/19/11	KZ
2,4-Dimethylphenol	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
bis(2-Chloroethoxy)methane	<0.0020		mg/L	EPA 8270C	1	0.0020	11/19/11	KZ
2,4-Dichlorophenol	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
1,2,4-Trichlorobenzene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Naphthalene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
4-Chloroaniline	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Hexachlorobutadiene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
4-Chloro-3-Methylphenol	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Hexachlorocyclopentadiene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
2,4,6-Trichlorophenol	<0.010		mg/L	EPA 8270C	1	0.010	11/19/11	KZ
2-Chloronaphthalene	<0.019		mg/L	EPA 8270C	1	0.019	11/19/11	KZ
Dimethyl Phthalate(DEP)	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Acenaphthylene	<0.0010		mg/L	EPA 8270C	1	0.0010	11/19/11	KZ
2,6-Dinitrotoluene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Acenaphthene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
2,4-Dinitrophenol	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
4-Nitrophenol	<0.010		mg/L	EPA 8270C	1	0.010	11/19/11	KZ
2,4-Dinitrotoluene	<0.048		mg/L	EPA 8270C	1	0.048	11/19/11	KZ
Fluorene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Diethyl Phthalate	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
4-Chlorophenyl Phenyl Ether	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
2-Methyl-4,6-Dinitrophenol	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
n-Nitroso-Diphenylamine	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
4-Bromophenyl Phenyl Ether	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Hexachlorobenzene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Pentachlorophenol	<0.048		mg/L	EPA 8270C	1	0.048	11/19/11	KZ
Anthracene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Phenanthrene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ

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CERTIFICATE OF ANALYSIS

1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 001 **EBQC-1** Date & Time Sampled: 11/15/11 @ 9:15
Sample Matrix: **Aqueous**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Di-n-Butyl Phthalate	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Fluoranthene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Pyrene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Benzyl Butyl Phthalate(BBP)	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Benzo(a)anthracene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
3,3-Dichlorobenzidine	<0.048		mg/L	EPA 8270C	1	0.048	11/19/11	KZ
bis(2-Ethylhexyl) phthalate	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Chrysene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Di-n-Octyl Phthalate	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Benzo(b)fluoranthene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Benzo(k)fluoranthene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Benzo(a)pyrene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Indeno(1,2,3-c,d)pyrene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Dibenzo(a,h)anthracene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Benzo(g,h,i)perylene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Dibenzofuran	<0.0010		mg/L	EPA 8270C	1	0.0010	11/19/11	KZ
2-Methylnapthalene	<0.0010		mg/L	EPA 8270C	1	0.0010	11/19/11	KZ
3/4-Methylphenol(Cresol)	<0.0050		mg/L	EPA 8270C	1	0.0050	11/19/11	KZ
2-Methylphenol(o-Cresol)	<0.0050		mg/L	EPA 8270C	1	0.0050	11/19/11	KZ
2-Nitroaniline	<0.0030		mg/L	EPA 8270C	1	0.0030	11/19/11	KZ
3-Nitroaniline	<0.0030		mg/L	EPA 8270C	1	0.0030	11/19/11	KZ
4-Nitroaniline	<0.010		mg/L	EPA 8270C	1	0.010	11/19/11	KZ
2,4,5-Trichlorophenol	<0.0060		mg/L	EPA 8270C	1	0.0060	11/19/11	KZ
[Semi-Volatile Surrogates]								
2-Fluorophenol	69		%REC	EPA 8270C		10-124	11/19/11	KZ
Phenol-D5	72		%REC	EPA 8270C		10-97.5	11/19/11	KZ
Nitrobenzene-D5	80		%REC	EPA 8270C		10-139	11/19/11	KZ
2-Fluorobiphenyl	84		%REC	EPA 8270C		5-91.4	11/19/11	KZ
2,4,6-Tribromophenol	65		%REC	EPA 8270C		10-107	11/19/11	KZ
p-Terphenyl-D14	73		%REC	EPA 8270C		10-157	11/19/11	KZ
[PCBs]								

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1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 001 **EBQC-1**					Date & Time Sampled:		11/15/11 @ 9:15	
Sample Matrix: **Aqueous**								
.....continued								
Sep Funnel LLE	Complete			EPA 3510C	1		11/19/11	KZ
Aroclor 1016	<0.50		µg/L	EPA 8082	1	0.50	11/18/11	KZ
Aroclor 1221	<0.50		µg/L	EPA 8082	1	0.50	11/18/11	KZ
Aroclor 1232	<0.50		µg/L	EPA 8082	1	0.50	11/18/11	KZ
Aroclor 1242	<0.50		µg/L	EPA 8082	1	0.50	11/18/11	KZ
Aroclor 1248	<0.50		µg/L	EPA 8082	1	0.50	11/18/11	KZ
Aroclor 1254	<0.50		µg/L	EPA 8082	1	0.50	11/18/11	KZ
Aroclor 1260	<0.50		µg/L	EPA 8082	1	0.50	11/18/11	KZ
[Surrogates]								
Tetrachloro-m-xylene	71		%REC	EPA 8081A/8082		50-150	11/18/11	KZ
Decachlorobiphenyl	73		%REC	EPA 8081A/8082		50-150	11/18/11	KZ
Sample: 002 **HA-3@0.5-1.0**					Date & Time Sampled:		11/15/11 @ 10:20	
Sample Matrix: **Solid**								
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/18/11	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Arsenic	**1.44**		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Barium	**45.9**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Chromium	**16.0**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cobalt	**10.7**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Copper	**51.8**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Lead	**27.5**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Molybdenum	**1.35**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Nickel	**56.1**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Vanadium	**16.9**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Zinc	**94.1**		mg/Kg	EPA 6010B	1	5.00	11/18/11	TLB

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25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 002 **HA-3@0.5-1.0** Date & Time Sampled: 11/15/11 @ 10:20
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1		11/20/11	KZ
Mercury	<0.0200		mg/Kg	EPA 7471A	1	0.0200	11/20/11	KZ
[Semi-Volatile Organics]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/20/11	KZ
Acenaphthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Acenaphthylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(b)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(g,h,i)perylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(k)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethoxy)methane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethyl) ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroisopropyl)ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Ethylhexyl) phthalate	<0.25		mg/Kg	EPA 8270C	1	0.25	11/20/11	KZ
4-Bromophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzyl Butyl Phthalate(BBP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloro-3-Methylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloroaniline	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chloronaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chlorophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Chrysene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Di-n-Butyl Phthalate	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Di-n-Octyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzo(a,h)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzofuran	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,3-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 002 **HA-3@0.5-1.0** Date & Time Sampled: 11/15/11 @ 10:20
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
1,4-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3,3-Dichlorobenzidine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Diethyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dimethyl Phthalate(DEP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dimethylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methyl-4,6-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,6-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluorene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobutadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorocyclopentadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachloroethane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Indeno(1,2,3-c,d)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Isophorone	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylnaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3/4-Methylphenol(Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylphenol(o-Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Naphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
3-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
4-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Nitrobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitrophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Nitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
n-Nitrosodi-n-Propylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
n-Nitroso-Diphenylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pentachlorophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ

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Invoice No.	66388
Cust #	1003
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Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 002 **HA-3@0.5-1.0** Sample Matrix: **Solid**					Date & Time Sampled:		11/15/11 @ 10:20	
.....continued								
Phenanthrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Phenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2,4-Trichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,5-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,6-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
[Semi-Volatile Surrogates]								
2-Fluorophenol	67		%REC	EPA 8270C		25-121	11/20/11	KZ
Phenol-D5	59		%REC	EPA 8270C		24-113	11/20/11	KZ
Nitrobenzene-D5	63		%REC	EPA 8270C		23-120	11/20/11	KZ
2-Fluorobiphenyl	67		%REC	EPA 8270C		30-115	11/20/11	KZ
2,4,6-Tribromophenol	48		%REC	EPA 8270C		19-122	11/20/11	KZ
p-Terphenyl-D14	50		%REC	EPA 8270C		18-137	11/20/11	KZ
[PCBs]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/18/11	KZ
Aroclor 1016	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1221	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1232	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1242	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1248	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1254	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1260	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
[Surrogates]								
Tetrachloro-m-xylene	70		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Decachlorobiphenyl	76		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Sample: 003 **HA-3@1.5-2.0** Sample Matrix: **Solid**					Date & Time Sampled:		11/15/11 @ 10:22	
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/18/11	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB

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1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 003 **HA-3@1.5-2.0**					Date & Time Sampled:		11/15/11 @ 10:22	
Sample Matrix: **Solid**								
.....continued								
Barium	**31.3**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Chromium	**9.79**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cobalt	**8.56**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Copper	**23.9**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Lead	**11.1**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Nickel	**44.9**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Vanadium	**14.6**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Zinc	**39.4**		mg/Kg	EPA 6010B	1	5.00	11/18/11	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1		11/20/11	KZ
Mercury	<0.0200		mg/Kg	EPA 7471A	1	0.0200	11/20/11	KZ
[Semi-Volatile Organics]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/20/11	KZ
Acenaphthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Acenaphthylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(b)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(g,h,i)perylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(k)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethoxy)methane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethyl) ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroisopropyl)ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Ethylhexyl) phthalate	<0.25		mg/Kg	EPA 8270C	1	0.25	11/20/11	KZ

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ANNE PEREZ
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REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 003 **HA-3@1.5-2.0** Date & Time Sampled: 11/15/11 @ 10:22
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
4-Bromophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzyl Butyl Phthalate(BBP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloro-3-Methylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloroaniline	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chloronaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chlorophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Chrysene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Di-n-Butyl Phthalate	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Di-n-Octyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzo(a,h)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzofuran	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,3-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,4-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3,3-Dichlorobenzidine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Diethyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dimethyl Phthalate(DEP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dimethylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methyl-4,6-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,6-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluorene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobutadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorocyclopentadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachloroethane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Indeno(1,2,3-c,d)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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Date Reported	11/22/11
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Invoice No.	66388
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Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 003 **HA-3@1.5-2.0** Date & Time Sampled: 11/15/11 @ 10:22
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Isophorone	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylnaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3/4-Methylphenol(Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylphenol(o-Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Naphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
3-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
4-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Nitrobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitrophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Nitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
n-Nitrosodi-n-Propylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
n-Nitroso-Diphenylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pentachlorophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Phenanthrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Phenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2,4-Trichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,5-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,6-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
[Semi-Volatile Surrogates]								
2-Fluorophenol	66		%REC	EPA 8270C		25-121	11/20/11	KZ
Phenol-D5	59		%REC	EPA 8270C		24-113	11/20/11	KZ
Nitrobenzene-D5	72		%REC	EPA 8270C		23-120	11/20/11	KZ
2-Fluorobiphenyl	70		%REC	EPA 8270C		30-115	11/20/11	KZ
2,4,6-Tribromophenol	58		%REC	EPA 8270C		19-122	11/20/11	KZ
p-Terphenyl-D14	64		%REC	EPA 8270C		18-137	11/20/11	KZ
[PCBs]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/18/11	KZ
Aroclor 1016	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1221	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ

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Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
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Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 003 **HA-3@1.5-2.0** Sample Matrix: **Solid**					Date & Time Sampled:		11/15/11 @ 10:22	
.....continued								
Aroclor 1232	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1242	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1248	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1254	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1260	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
[Surrogates]								
Tetrachloro-m-xylene	69		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Decachlorobiphenyl	62		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Sample: 004 **HA-8@0.5-1.0** Sample Matrix: **Solid**					Date & Time Sampled:		11/15/11 @ 12:47	
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/18/11	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Barium	**16.3**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Chromium	**12.4**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cobalt	**19.5**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Copper	**56.5**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Lead	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Nickel	**105**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Vanadium	**22.7**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Zinc	**22.6**		mg/Kg	EPA 6010B	1	5.00	11/18/11	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1		11/20/11	KZ
Mercury	<0.0200		mg/Kg	EPA 7471A	1	0.0200	11/20/11	KZ

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Project: AECOM-DEVORE INTERCHANGE

Sample: 004 **HA-8@0.5-1.0** Date & Time Sampled: 11/15/11 @ 12:47
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
[Semi-Volatile Organics]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/20/11	KZ
Acenaphthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Acenaphthylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(b)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(g,h,i)perylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(k)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethoxy)methane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethyl) ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroisopropyl)ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Ethylhexyl) phthalate	<0.25		mg/Kg	EPA 8270C	1	0.25	11/20/11	KZ
4-Bromophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzyl Butyl Phthalate(BBP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloro-3-Methylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloroaniline	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chloronaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chlorophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Chrysene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Di-n-Butyl Phthalate	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Di-n-Octyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzo(a,h)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzofuran	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,3-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,4-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3,3-Dichlorobenzidine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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CERTIFICATE OF ANALYSIS

1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 004 **HA-8@0.5-1.0** Date & Time Sampled: 11/15/11 @ 12:47
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Diethyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dimethyl Phthalate(DEP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dimethylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methyl-4,6-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,6-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluorene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobutadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorocyclopentadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachloroethane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Indeno(1,2,3-c,d)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Isophorone	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylnaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3/4-Methylphenol(Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylphenol(o-Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Naphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
3-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
4-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Nitrobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitrophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Nitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
n-Nitrosodi-n-Propylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
n-Nitroso-Diphenylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pentachlorophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Phenanthrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Phenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 004 **HA-8@0.5-1.0**					Date & Time Sampled:		11/15/11 @ 12:47	
Sample Matrix: **Solid**								
.....continued								
1,2,4-Trichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,5-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,6-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
[Semi-Volatile Surrogates]								
2-Fluorophenol	66		%REC	EPA 8270C		25-121	11/20/11	KZ
Phenol-D5	69		%REC	EPA 8270C		24-113	11/20/11	KZ
Nitrobenzene-D5	78		%REC	EPA 8270C		23-120	11/20/11	KZ
2-Fluorobiphenyl	62		%REC	EPA 8270C		30-115	11/20/11	KZ
2,4,6-Tribromophenol	59		%REC	EPA 8270C		19-122	11/20/11	KZ
p-Terphenyl-D14	71		%REC	EPA 8270C		18-137	11/20/11	KZ
[PCBs]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/18/11	KZ
Aroclor 1016	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1221	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1232	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1242	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1248	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1254	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1260	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
[Surrogates]								
Tetrachloro-m-xylene	70		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Decachlorobiphenyl	73		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Sample: 005 **HA-8@1.5-2.0**					Date & Time Sampled:		11/15/11 @ 12:49	
Sample Matrix: **Solid**								
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/18/11	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Barium	**17.2**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 005 **HA-8@1.5-2.0** Date & Time Sampled: 11/15/11 @ 12:49
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Chromium	**14.8**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cobalt	**20.3**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Copper	**58.8**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Lead	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Nickel	**117**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Vanadium	**22.4**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Zinc	**22.7**		mg/Kg	EPA 6010B	1	5.00	11/18/11	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1		11/20/11	KZ
Mercury	<0.0200		mg/Kg	EPA 7471A	1	0.0200	11/20/11	KZ
[Semi-Volatile Organics]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/20/11	KZ
Acenaphthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Acenaphthylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(b)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(g,h,i)perylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(k)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethoxy)methane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethyl) ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroisopropyl)ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Ethylhexyl) phthalate	<0.25		mg/Kg	EPA 8270C	1	0.25	11/20/11	KZ
4-Bromophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzyl Butyl Phthalate(BBP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloro-3-Methylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 005 **HA-8@1.5-2.0** Date & Time Sampled: 11/15/11 @ 12:49
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
4-Chloroaniline	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chloronaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chlorophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Chrysene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Di-n-Butyl Phthalate	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Di-n-Octyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzo(a,h)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzofuran	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,3-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,4-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3,3-Dichlorobenzidine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Diethyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dimethyl Phthalate(DEP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dimethylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methyl-4,6-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,6-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluorene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobutadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorocyclopentadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachloroethane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Indeno(1,2,3-c,d)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Isophorone	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylnaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3/4-Methylphenol(Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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Project: AECOM-DEVORE INTERCHANGE

Sample: 005 **HA-8@1.5-2.0** Date & Time Sampled: 11/15/11 @ 12:49
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
2-Methylphenol(o-Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Naphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
3-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
4-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Nitrobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitrophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Nitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
n-Nitrosodi-n-Propylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
n-Nitroso-Diphenylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pentachlorophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Phenanthrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Phenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2,4-Trichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,5-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,6-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
[Semi-Volatile Surrogates]								
2-Fluorophenol	80		%REC	EPA 8270C		25-121	11/20/11	KZ
Phenol-D5	82		%REC	EPA 8270C		24-113	11/20/11	KZ
Nitrobenzene-D5	85		%REC	EPA 8270C		23-120	11/20/11	KZ
2-Fluorobiphenyl	79		%REC	EPA 8270C		30-115	11/20/11	KZ
2,4,6-Tribromophenol	76		%REC	EPA 8270C		19-122	11/20/11	KZ
p-Terphenyl-D14	74		%REC	EPA 8270C		18-137	11/20/11	KZ
[PCBs]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/18/11	KZ
Aroclor 1016	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1221	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1232	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1242	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1248	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ

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CERTIFICATE OF ANALYSIS

1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 005 **HA-8@1.5-2.0** Sample Matrix: **Solid**					Date & Time Sampled:		11/15/11 @ 12:49	
.....continued								
Aroclor 1254	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1260	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
[Surrogates]								
Tetrachloro-m-xylene	69		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Decachlorobiphenyl	62		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Sample: 006 **HA-11@0.5-1.0** Sample Matrix: **Solid**					Date & Time Sampled:		11/15/11 @ 13:13	
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/18/11	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Barium	**37.2**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Chromium	**9.77**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cobalt	**6.74**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Copper	**22.9**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Lead	**11.4**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Nickel	**32.1**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Vanadium	**14.5**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Zinc	**40.8**		mg/Kg	EPA 6010B	1	5.00	11/18/11	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1		11/20/11	KZ
Mercury	**0.067**		mg/Kg	EPA 7471A	1	0.0200	11/20/11	KZ
[Semi-Volatile Organics]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/20/11	KZ
Acenaphthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
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Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 006 **HA-11@0.5-1.0** Date & Time Sampled: 11/15/11 @ 13:13
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Acenaphthylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(b)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(g,h,i)perylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(k)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethoxy)methane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethyl) ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroisopropyl)ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Ethylhexyl) phthalate	<0.25		mg/Kg	EPA 8270C	1	0.25	11/20/11	KZ
4-Bromophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzyl Butyl Phthalate(BBP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloro-3-Methylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloroaniline	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chloronaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chlorophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Chrysene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Di-n-Butyl Phthalate	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Di-n-Octyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzo(a,h)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzofuran	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,3-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,4-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3,3-Dichlorobenzidine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Diethyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dimethyl Phthalate(DEP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dimethylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 006 **HA-11@0.5-1.0** Date & Time Sampled: 11/15/11 @ 13:13
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
2-Methyl-4,6-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,6-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluorene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobutadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorocyclopentadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachloroethane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Indeno(1,2,3-c,d)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Isophorone	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylnaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3/4-Methylphenol(Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylphenol(o-Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Naphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
3-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
4-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Nitrobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitrophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Nitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
n-Nitrosodi-n-Propylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
n-Nitroso-Diphenylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pentachlorophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Phenanthrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Phenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2,4-Trichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,5-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,6-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 006 **HA-11@0.5-1.0**					Date & Time Sampled:		11/15/11 @ 13:13	
Sample Matrix: **Solid**								
.....continued								
[Semi-Volatile Surrogates]								
2-Fluorophenol	68		%REC	EPA 8270C		25-121	11/20/11	KZ
Phenol-D5	62		%REC	EPA 8270C		24-113	11/20/11	KZ
Nitrobenzene-D5	69		%REC	EPA 8270C		23-120	11/20/11	KZ
2-Fluorobiphenyl	60		%REC	EPA 8270C		30-115	11/20/11	KZ
2,4,6-Tribromophenol	58		%REC	EPA 8270C		19-122	11/20/11	KZ
p-Terphenyl-D14	55		%REC	EPA 8270C		18-137	11/20/11	KZ
[PCBs]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/18/11	KZ
Aroclor 1016	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1221	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1232	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1242	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1248	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1254	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1260	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
[Surrogates]								
Tetrachloro-m-xylene	78		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Decachlorobiphenyl	70		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Sample: 007 **HA-11@1.5-2.0**					Date & Time Sampled:		11/15/11 @ 13:22	
Sample Matrix: **Solid**								
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/18/11	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Arsenic	**1.36**		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Barium	**77.8**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Chromium	**13.4**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cobalt	**7.71**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Copper	**52.7**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB

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Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 007 **HA-11@1.5-2.0**					Date & Time Sampled:		11/15/11 @ 13:22	
Sample Matrix: **Solid**								
.....continued								
Lead	**28.3**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Molybdenum	**1.81**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Nickel	**34.5**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Vanadium	**18.2**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Zinc	**74.9**		mg/Kg	EPA 6010B	1	5.00	11/18/11	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1		11/20/11	KZ
Mercury	<0.0200		mg/Kg	EPA 7471A	1	0.0200	11/20/11	KZ
[Semi-Volatile Organics]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/20/11	KZ
Acenaphthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Acenaphthylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(b)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(g,h,i)perylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(k)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethoxy)methane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethyl) ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroisopropyl)ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Ethylhexyl) phthalate	<0.25		mg/Kg	EPA 8270C	1	0.25	11/20/11	KZ
4-Bromophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzyl Butyl Phthalate(BBP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloro-3-Methylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloroaniline	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chloronaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 007 **HA-11@1.5-2.0** Date & Time Sampled: 11/15/11 @ 13:22
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
4-Chlorophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Chrysene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Di-n-Butyl Phthalate	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Di-n-Octyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzo(a,h)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzofuran	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,3-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,4-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3,3-Dichlorobenzidine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Diethyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dimethyl Phthalate(DEP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dimethylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methyl-4,6-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,6-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluorene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobutadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorocyclopentadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachloroethane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Indeno(1,2,3-c,d)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Isophorone	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylnaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3/4-Methylphenol(Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylphenol(o-Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Naphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ

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CERTIFICATE OF ANALYSIS

1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 007 **HA-11@1.5-2.0** Date & Time Sampled: 11/15/11 @ 13:22
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
3-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
4-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Nitrobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitrophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Nitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
n-Nitrosodi-n-Propylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
n-Nitroso-Diphenylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pentachlorophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Phenanthrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Phenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2,4-Trichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,5-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,6-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
[Semi-Volatile Surrogates]								
2-Fluorophenol	77		%REC	EPA 8270C		25-121	11/20/11	KZ
Phenol-D5	72		%REC	EPA 8270C		24-113	11/20/11	KZ
Nitrobenzene-D5	69		%REC	EPA 8270C		23-120	11/20/11	KZ
2-Fluorobiphenyl	65		%REC	EPA 8270C		30-115	11/20/11	KZ
2,4,6-Tribromophenol	76		%REC	EPA 8270C		19-122	11/20/11	KZ
p-Terphenyl-D14	79		%REC	EPA 8270C		18-137	11/20/11	KZ
[PCBs]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/18/11	KZ
Aroclor 1016	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1221	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1232	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1242	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1248	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1254	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1260	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
[Surrogates]								

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1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 007 **HA-11@1.5-2.0** Sample Matrix: **Solid**					Date & Time Sampled:		11/15/11 @ 13:22	
.....continued								
Tetrachloro-m-xylene	80		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Decachlorobiphenyl	72		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Sample: 008 **HA-12@0.5-1.0** Sample Matrix: **Solid**					Date & Time Sampled:		11/15/11 @ 13:46	
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/18/11	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Barium	**18.5**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Chromium	**14.2**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cobalt	**17.8**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Copper	**50.9**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Lead	**0.666**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Nickel	**91.2**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Vanadium	**22.0**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Zinc	**21.1**		mg/Kg	EPA 6010B	1	5.00	11/18/11	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1		11/20/11	KZ
Mercury	<0.0200		mg/Kg	EPA 7471A	1	0.0200	11/20/11	KZ
[Semi-Volatile Organics]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/20/11	KZ
Acenaphthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Acenaphthylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 008 **HA-12@0.5-1.0** Date & Time Sampled: 11/15/11 @ 13:46
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Benzo(a)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(b)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(g,h,i)perylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(k)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethoxy)methane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethyl) ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroisopropyl)ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Ethylhexyl) phthalate	<0.25		mg/Kg	EPA 8270C	1	0.25	11/20/11	KZ
4-Bromophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzyl Butyl Phthalate(BBP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloro-3-Methylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloroaniline	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chloronaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chlorophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Chrysene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Di-n-Butyl Phthalate	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Di-n-Octyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzo(a,h)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzofuran	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,3-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,4-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3,3-Dichlorobenzidine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Diethyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dimethyl Phthalate(DEP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dimethylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methyl-4,6-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 008 **HA-12@0.5-1.0** Date & Time Sampled: 11/15/11 @ 13:46
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
2,6-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluorene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobutadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorocyclopentadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachloroethane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Indeno(1,2,3-c,d)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Isophorone	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylnaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3/4-Methylphenol(Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylphenol(o-Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Naphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
3-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
4-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Nitrobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitrophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Nitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
n-Nitrosodi-n-Propylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
n-Nitroso-Diphenylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pentachlorophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Phenanthrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Phenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2,4-Trichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,5-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,6-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
[Semi-Volatile Surrogates]								
2-Fluorophenol	84		%REC	EPA 8270C		25-121	11/20/11	KZ
Phenol-D5	82		%REC	EPA 8270C		24-113	11/20/11	KZ

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Invoice No.	66388
Cust #	1003
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Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 008 **HA-12@0.5-1.0**					Date & Time Sampled:		11/15/11 @ 13:46	
Sample Matrix: **Solid**								
.....continued								
Nitrobenzene-D5	80		%REC	EPA 8270C		23-120	11/20/11	KZ
2-Fluorobiphenyl	76		%REC	EPA 8270C		30-115	11/20/11	KZ
2,4,6-Tribromophenol	72		%REC	EPA 8270C		19-122	11/20/11	KZ
p-Terphenyl-D14	82		%REC	EPA 8270C		18-137	11/20/11	KZ
[PCBs]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/18/11	KZ
Aroclor 1016	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1221	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1232	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1242	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1248	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1254	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1260	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
[Surrogates]								
Tetrachloro-m-xylene	76		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Decachlorobiphenyl	79		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Sample: 009 **HA-12@1.5-2.0**					Date & Time Sampled:		11/15/11 @ 13:48	
Sample Matrix: **Solid**								
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/18/11	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Barium	**19.6**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Chromium	**11.5**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cobalt	**16.3**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Copper	**48.8**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Lead	**0.528**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Nickel	**80.5**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB

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1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 009 **HA-12@1.5-2.0** Date & Time Sampled: 11/15/11 @ 13:48
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Selenium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Vanadium	**21.6**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Zinc	**20.9**		mg/Kg	EPA 6010B	1	5.00	11/18/11	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1		11/20/11	KZ
Mercury	<0.0200		mg/Kg	EPA 7471A	1	0.0200	11/20/11	KZ
[Semi-Volatile Organics]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/20/11	KZ
Acenaphthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Acenaphthylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(b)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(g,h,i)perylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(k)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethoxy)methane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethyl) ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroisopropyl)ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Ethylhexyl) phthalate	<0.25		mg/Kg	EPA 8270C	1	0.25	11/20/11	KZ
4-Bromophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzyl Butyl Phthalate(BBP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloro-3-Methylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloroaniline	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chloronaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chlorophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Chrysene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Di-n-Butyl Phthalate	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ

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1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 009 **HA-12@1.5-2.0** Date & Time Sampled: 11/15/11 @ 13:48
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Di-n-Octyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzo(a,h)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzofuran	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,3-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,4-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3,3-Dichlorobenzidine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Diethyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dimethyl Phthalate(DEP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dimethylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methyl-4,6-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,6-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluorene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobutadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorocyclopentadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachloroethane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Indeno(1,2,3-c,d)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Isophorone	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylnaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3/4-Methylphenol(Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylphenol(o-Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Naphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
3-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
4-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Nitrobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 009 **HA-12@1.5-2.0** Date & Time Sampled: 11/15/11 @ 13:48
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
2-Nitrophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Nitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
n-Nitrosodi-n-Propylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
n-Nitroso-Diphenylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pentachlorophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Phenanthrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Phenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2,4-Trichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,5-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,6-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
[Semi-Volatile Surrogates]								
2-Fluorophenol	60		%REC	EPA 8270C		25-121	11/20/11	KZ
Phenol-D5	57		%REC	EPA 8270C		24-113	11/20/11	KZ
Nitrobenzene-D5	53		%REC	EPA 8270C		23-120	11/20/11	KZ
2-Fluorobiphenyl	50		%REC	EPA 8270C		30-115	11/20/11	KZ
2,4,6-Tribromophenol	54		%REC	EPA 8270C		19-122	11/20/11	KZ
p-Terphenyl-D14	49		%REC	EPA 8270C		18-137	11/20/11	KZ
[PCBs]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/18/11	KZ
Aroclor 1016	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1221	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1232	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1242	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1248	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1254	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1260	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
[Surrogates]								
Tetrachloro-m-xylene	80		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Decachlorobiphenyl	71		%REC	EPA 8081A/8082		50-150	11/19/11	KZ

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1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 010 **HA-13@0.5-1.0**					Date & Time Sampled:		11/15/11 @ 13:52	
Sample Matrix: **Solid**								
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/18/11	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Barium	**19.4**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Chromium	**10.9**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cobalt	**15.9**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Copper	**46.6**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Lead	**6.96**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Nickel	**87.4**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Vanadium	**14.4**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Zinc	**29.0**		mg/Kg	EPA 6010B	1	5.00	11/18/11	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1		11/20/11	KZ
Mercury	**0.229**		mg/Kg	EPA 7471A	1	0.0200	11/20/11	KZ
[Semi-Volatile Organics]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/20/11	KZ
Acenaphthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Acenaphthylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(b)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(g,h,i)perylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(k)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethoxy)methane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 010 **HA-13@0.5-1.0** Date & Time Sampled: 11/15/11 @ 13:52
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
bis(2-Chloroethyl) ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroisopropyl)ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Ethylhexyl) phthalate	<0.25		mg/Kg	EPA 8270C	1	0.25	11/20/11	KZ
4-Bromophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzyl Butyl Phthalate(BBP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloro-3-Methylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloroaniline	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chloronaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chlorophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Chrysene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Di-n-Butyl Phthalate	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Di-n-Octyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzo(a,h)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzofuran	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,3-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,4-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3,3-Dichlorobenzidine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Diethyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dimethyl Phthalate(DEP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dimethylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methyl-4,6-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,6-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluorene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobutadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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CERTIFICATE OF ANALYSIS

1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 010 **HA-13@0.5-1.0**					Date & Time Sampled:		11/15/11 @ 13:52	
Sample Matrix: **Solid**								
.....continued								
Hexachlorocyclopentadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachloroethane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Indeno(1,2,3-c,d)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Isophorone	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylnaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3/4-Methylphenol(Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylphenol(o-Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Naphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
3-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
4-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Nitrobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitrophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Nitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
n-Nitrosodi-n-Propylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
n-Nitroso-Diphenylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pentachlorophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Phenanthrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Phenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2,4-Trichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,5-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,6-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
[Semi-Volatile Surrogates]								
2-Fluorophenol	60		%REC	EPA 8270C		25-121	11/20/11	KZ
Phenol-D5	54		%REC	EPA 8270C		24-113	11/20/11	KZ
Nitrobenzene-D5	53		%REC	EPA 8270C		23-120	11/20/11	KZ
2-Fluorobiphenyl	72		%REC	EPA 8270C		30-115	11/20/11	KZ
2,4,6-Tribromophenol	76		%REC	EPA 8270C		19-122	11/20/11	KZ
p-Terphenyl-D14	61		%REC	EPA 8270C		18-137	11/20/11	KZ
[PCBs]								

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1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 010 **HA-13@0.5-1.0**					Date & Time Sampled:		11/15/11 @ 13:52	
Sample Matrix: **Solid**								
.....continued								
Ultrasonic Extraction	Complete			EPA 3550	1		11/18/11	KZ
Aroclor 1016	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1221	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1232	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1242	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1248	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1254	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1260	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
[Surrogates]								
Tetrachloro-m-xylene	68		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Decachlorobiphenyl	74		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Sample: 011 **HA-13@1.5-2.0**					Date & Time Sampled:		11/15/11 @ 13:45	
Sample Matrix: **Solid**								
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/18/11	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Barium	**39.1**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Chromium	**17.4**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cobalt	**12.8**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Copper	**48.3**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Lead	**24.9**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Nickel	**64.3**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Vanadium	**18.0**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Zinc	**44.8**		mg/Kg	EPA 6010B	1	5.00	11/18/11	TLB

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 011 **HA-13@1.5-2.0** Date & Time Sampled: 11/15/11 @ 13:45
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1		11/20/11	KZ
Mercury	**0.199**		mg/Kg	EPA 7471A	1	0.0200	11/20/11	KZ
[Semi-Volatile Organics]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/20/11	KZ
Acenaphthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Acenaphthylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(b)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(g,h,i)perylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(k)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethoxy)methane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethyl) ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroisopropyl)ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Ethylhexyl) phthalate	<0.25		mg/Kg	EPA 8270C	1	0.25	11/20/11	KZ
4-Bromophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzyl Butyl Phthalate(BBP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloro-3-Methylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloroaniline	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chloronaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chlorophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Chrysene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Di-n-Butyl Phthalate	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Di-n-Octyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzo(a,h)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzofuran	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,3-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 011 **HA-13@1.5-2.0** Date & Time Sampled: 11/15/11 @ 13:45
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
1,4-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3,3-Dichlorobenzidine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Diethyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dimethyl Phthalate(DEP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dimethylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methyl-4,6-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,6-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluorene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobutadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorocyclopentadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachloroethane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Indeno(1,2,3-c,d)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Isophorone	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylnaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3/4-Methylphenol(Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylphenol(o-Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Naphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
3-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
4-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Nitrobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitrophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Nitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
n-Nitrosodi-n-Propylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
n-Nitroso-Diphenylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pentachlorophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ

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Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 011 **HA-13@1.5-2.0** Sample Matrix: **Solid**					Date & Time Sampled:		11/15/11 @ 13:45	
.....continued								
Phenanthrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Phenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2,4-Trichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,5-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,6-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
[Semi-Volatile Surrogates]								
2-Fluorophenol	66		%REC	EPA 8270C		25-121	11/20/11	KZ
Phenol-D5	69		%REC	EPA 8270C		24-113	11/20/11	KZ
Nitrobenzene-D5	62		%REC	EPA 8270C		23-120	11/20/11	KZ
2-Fluorobiphenyl	58		%REC	EPA 8270C		30-115	11/20/11	KZ
2,4,6-Tribromophenol	70		%REC	EPA 8270C		19-122	11/20/11	KZ
p-Terphenyl-D14	73		%REC	EPA 8270C		18-137	11/20/11	KZ
[PCBs]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/18/11	KZ
Aroclor 1016	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1221	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1232	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1242	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1248	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1254	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1260	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
[Surrogates]								
Tetrachloro-m-xylene	81		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Decachlorobiphenyl	73		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Sample: 012 **HA-14@0.5-1.0** Sample Matrix: **Solid**					Date & Time Sampled:		11/15/11 @ 14:00	
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/18/11	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB

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CERTIFICATE OF ANALYSIS

1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 012 **HA-14@0.5-1.0**					Date & Time Sampled:		11/15/11 @ 14:00	
Sample Matrix: **Solid**								
.....continued								
Barium	**40.9**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Chromium	**12.7**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cobalt	**13.8**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Copper	**46.6**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Lead	**30.1**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Nickel	**67.3**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Vanadium	**20.2**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Zinc	**53.4**		mg/Kg	EPA 6010B	1	5.00	11/18/11	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1		11/20/11	KZ
Mercury	**0.151**		mg/Kg	EPA 7471A	1	0.0200	11/20/11	KZ
[Semi-Volatile Organics]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/20/11	KZ
Acenaphthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Acenaphthylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(b)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(g,h,i)perylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(k)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethoxy)methane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethyl) ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroisopropyl)ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Ethylhexyl) phthalate	<0.25		mg/Kg	EPA 8270C	1	0.25	11/20/11	KZ

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ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 012 **HA-14@0.5-1.0** Date & Time Sampled: 11/15/11 @ 14:00
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
4-Bromophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzyl Butyl Phthalate(BBP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloro-3-Methylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloroaniline	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chloronaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chlorophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Chrysene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Di-n-Butyl Phthalate	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Di-n-Octyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzo(a,h)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzofuran	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,3-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,4-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3,3-Dichlorobenzidine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Diethyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dimethyl Phthalate(DEP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dimethylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methyl-4,6-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,6-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluorene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobutadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorocyclopentadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachloroethane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Indeno(1,2,3-c,d)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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STANTEC
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REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 012 **HA-14@0.5-1.0** Date & Time Sampled: 11/15/11 @ 14:00
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Isophorone	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylnaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3/4-Methylphenol(Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylphenol(o-Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Naphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
3-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
4-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Nitrobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitrophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Nitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
n-Nitrosodi-n-Propylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
n-Nitroso-Diphenylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pentachlorophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Phenanthrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Phenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2,4-Trichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,5-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,6-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
[Semi-Volatile Surrogates]								
2-Fluorophenol	73		%REC	EPA 8270C		25-121	11/20/11	KZ
Phenol-D5	70		%REC	EPA 8270C		24-113	11/20/11	KZ
Nitrobenzene-D5	64		%REC	EPA 8270C		23-120	11/20/11	KZ
2-Fluorobiphenyl	60		%REC	EPA 8270C		30-115	11/20/11	KZ
2,4,6-Tribromophenol	59		%REC	EPA 8270C		19-122	11/20/11	KZ
p-Terphenyl-D14	70		%REC	EPA 8270C		18-137	11/20/11	KZ
[PCBs]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/18/11	KZ
Aroclor 1016	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1221	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 012 **HA-14@0.5-1.0** Sample Matrix: **Solid**					Date & Time Sampled:		11/15/11 @ 14:00	
.....continued								
Aroclor 1232	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1242	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1248	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1254	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1260	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
[Surrogates]								
Tetrachloro-m-xylene	65		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Decachlorobiphenyl	60		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Sample: 013 **HA-14@1.5-2.0** Sample Matrix: **Solid**					Date & Time Sampled:		11/15/11 @ 14:03	
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/18/11	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Barium	**24.9**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Chromium	**7.29**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cobalt	**7.28**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Copper	**16.5**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Lead	**2.95**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Nickel	**33.8**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Vanadium	**13.3**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Zinc	**20.3**		mg/Kg	EPA 6010B	1	5.00	11/18/11	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1		11/20/11	KZ
Mercury	**0.134**		mg/Kg	EPA 7471A	1	0.0200	11/20/11	KZ

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Date Reported	11/22/11
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Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 013 **HA-14@1.5-2.0** Date & Time Sampled: 11/15/11 @ 14:03
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
[Semi-Volatile Organics]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/20/11	KZ
Acenaphthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Acenaphthylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(b)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(g,h,i)perylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(k)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethoxy)methane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethyl) ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroisopropyl)ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Ethylhexyl) phthalate	<0.25		mg/Kg	EPA 8270C	1	0.25	11/20/11	KZ
4-Bromophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzyl Butyl Phthalate(BBP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloro-3-Methylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloroaniline	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chloronaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chlorophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Chrysene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Di-n-Butyl Phthalate	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Di-n-Octyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzo(a,h)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzofuran	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,3-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,4-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3,3-Dichlorobenzidine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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CERTIFICATE OF ANALYSIS

1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 013 **HA-14@1.5-2.0** Date & Time Sampled: 11/15/11 @ 14:03
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Diethyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dimethyl Phthalate(DEP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dimethylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methyl-4,6-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,6-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluorene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobutadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorocyclopentadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachloroethane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Indeno(1,2,3-c,d)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Isophorone	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylnaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3/4-Methylphenol(Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylphenol(o-Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Naphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
3-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
4-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Nitrobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitrophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Nitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
n-Nitrosodi-n-Propylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
n-Nitroso-Diphenylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pentachlorophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Phenanthrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Phenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 013 **HA-14@1.5-2.0**					Date & Time Sampled:		11/15/11 @ 14:03	
Sample Matrix: **Solid**								
.....continued								
1,2,4-Trichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,5-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,6-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
[Semi-Volatile Surrogates]								
2-Fluorophenol	71		%REC	EPA 8270C		25-121	11/20/11	KZ
Phenol-D5	76		%REC	EPA 8270C		24-113	11/20/11	KZ
Nitrobenzene-D5	70		%REC	EPA 8270C		23-120	11/20/11	KZ
2-Fluorobiphenyl	64		%REC	EPA 8270C		30-115	11/20/11	KZ
2,4,6-Tribromophenol	60		%REC	EPA 8270C		19-122	11/20/11	KZ
p-Terphenyl-D14	61		%REC	EPA 8270C		18-137	11/20/11	KZ
[PCBs]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/18/11	KZ
Aroclor 1016	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1221	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1232	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1242	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1248	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1254	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1260	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
[Surrogates]								
Tetrachloro-m-xylene	76		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Decachlorobiphenyl	79		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Sample: 014 **HA-15@0.5-1.0**					Date & Time Sampled:		11/15/11 @ 14:08	
Sample Matrix: **Solid**								
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/18/11	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Barium	**56.3**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cadmium	**0.500**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 014 **HA-15@0.5-1.0** Date & Time Sampled: 11/15/11 @ 14:08
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Chromium	**15.6**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cobalt	**14.5**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Copper	**60.1**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Lead	**51.0**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Nickel	**76.9**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Vanadium	**20.5**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Zinc	**85.2**		mg/Kg	EPA 6010B	1	5.00	11/18/11	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1		11/20/11	KZ
Mercury	**0.188**		mg/Kg	EPA 7471A	1	0.0200	11/20/11	KZ
[Semi-Volatile Organics]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/20/11	KZ
Acenaphthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Acenaphthylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(b)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(g,h,i)perylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(k)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethoxy)methane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethyl) ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroisopropyl)ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Ethylhexyl) phthalate	<0.25		mg/Kg	EPA 8270C	1	0.25	11/20/11	KZ
4-Bromophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzyl Butyl Phthalate(BBP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloro-3-Methylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 014 **HA-15@0.5-1.0** Date & Time Sampled: 11/15/11 @ 14:08
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
4-Chloroaniline	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chloronaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chlorophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Chrysene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Di-n-Butyl Phthalate	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Di-n-Octyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzo(a,h)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzofuran	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,3-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,4-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3,3-Dichlorobenzidine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Diethyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dimethyl Phthalate(DEP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dimethylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methyl-4,6-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,6-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluorene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobutadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorocyclopentadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachloroethane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Indeno(1,2,3-c,d)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Isophorone	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylnaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3/4-Methylphenol(Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 014 **HA-15@0.5-1.0** Date & Time Sampled: 11/15/11 @ 14:08
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
2-Methylphenol(o-Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Naphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
3-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
4-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Nitrobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitrophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Nitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
n-Nitrosodi-n-Propylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
n-Nitroso-Diphenylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pentachlorophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Phenanthrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Phenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2,4-Trichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,5-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,6-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
[Semi-Volatile Surrogates]								
2-Fluorophenol	70		%REC	EPA 8270C		25-121	11/20/11	KZ
Phenol-D5	73		%REC	EPA 8270C		24-113	11/20/11	KZ
Nitrobenzene-D5	80		%REC	EPA 8270C		23-120	11/20/11	KZ
2-Fluorobiphenyl	71		%REC	EPA 8270C		30-115	11/20/11	KZ
2,4,6-Tribromophenol	64		%REC	EPA 8270C		19-122	11/20/11	KZ
p-Terphenyl-D14	59		%REC	EPA 8270C		18-137	11/20/11	KZ
[PCBs]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/18/11	KZ
Aroclor 1016	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1221	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1232	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1242	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1248	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ

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1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 014 **HA-15@0.5-1.0** Sample Matrix: **Solid**					Date & Time Sampled:		11/15/11 @ 14:08	
.....continued								
Aroclor 1254	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1260	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
[Surrogates]								
Tetrachloro-m-xylene	72		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Decachlorobiphenyl	78		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Sample: 015 **HA-15@1.5-2.0** Sample Matrix: **Solid**					Date & Time Sampled:		11/15/11 @ 14:10	
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/18/11	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Barium	**22.3**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Chromium	**12.6**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cobalt	**13.6**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Copper	**32.9**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Lead	**1.70**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Nickel	**71.3**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Vanadium	**14.5**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Zinc	**25.3**		mg/Kg	EPA 6010B	1	5.00	11/18/11	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1		11/20/11	KZ
Mercury	**0.182**		mg/Kg	EPA 7471A	1	0.0200	11/20/11	KZ
[Semi-Volatile Organics]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/20/11	KZ
Acenaphthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 015 **HA-15@1.5-2.0** Date & Time Sampled: 11/15/11 @ 14:10
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Acenaphthylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(b)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(g,h,i)perylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(k)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethoxy)methane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethyl) ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroisopropyl)ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Ethylhexyl) phthalate	<0.25		mg/Kg	EPA 8270C	1	0.25	11/20/11	KZ
4-Bromophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzyl Butyl Phthalate(BBP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloro-3-Methylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloroaniline	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chloronaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chlorophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Chrysene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Di-n-Butyl Phthalate	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Di-n-Octyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzo(a,h)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzofuran	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,3-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,4-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3,3-Dichlorobenzidine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Diethyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dimethyl Phthalate(DEP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dimethylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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STANTEC
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25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 015 **HA-15@1.5-2.0** Date & Time Sampled: 11/15/11 @ 14:10
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
2-Methyl-4,6-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,6-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluorene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobutadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorocyclopentadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachloroethane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Indeno(1,2,3-c,d)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Isophorone	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylnaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3/4-Methylphenol(Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylphenol(o-Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Naphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
3-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
4-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Nitrobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitrophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Nitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
n-Nitrosodi-n-Propylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
n-Nitroso-Diphenylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pentachlorophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Phenanthrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Phenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2,4-Trichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,5-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,6-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 015 **HA-15@1.5-2.0**					Date & Time Sampled:		11/15/11 @ 14:10	
Sample Matrix: **Solid**								
.....continued								
[Semi-Volatile Surrogates]								
2-Fluorophenol	56		%REC	EPA 8270C		25-121	11/20/11	KZ
Phenol-D5	64		%REC	EPA 8270C		24-113	11/20/11	KZ
Nitrobenzene-D5	68		%REC	EPA 8270C		23-120	11/20/11	KZ
2-Fluorobiphenyl	70		%REC	EPA 8270C		30-115	11/20/11	KZ
2,4,6-Tribromophenol	69		%REC	EPA 8270C		19-122	11/20/11	KZ
p-Terphenyl-D14	49		%REC	EPA 8270C		18-137	11/20/11	KZ
[PCBs]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/18/11	KZ
Aroclor 1016	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1221	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1232	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1242	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1248	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1254	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1260	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
[Surrogates]								
Tetrachloro-m-xylene	66		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Decachlorobiphenyl	63		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Sample: 016 **HA-16@0.5-1.0**					Date & Time Sampled:		11/15/11 @ 14:18	
Sample Matrix: **Solid**								
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/18/11	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Barium	**56.2**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Chromium	**12.6**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cobalt	**4.69**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Copper	**11.5**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB

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Date Reported	11/22/11
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Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 016 **HA-16@0.5-1.0** Date & Time Sampled: 11/15/11 @ 14:18
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Lead	**3.30**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Nickel	**8.01**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Vanadium	**21.8**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Zinc	**22.8**		mg/Kg	EPA 6010B	1	5.00	11/18/11	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1		11/20/11	KZ
Mercury	**0.186**		mg/Kg	EPA 7471A	1	0.0200	11/20/11	KZ
[Semi-Volatile Organics]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/20/11	KZ
Acenaphthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Acenaphthylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(b)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(g,h,i)perylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(k)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethoxy)methane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethyl) ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroisopropyl)ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Ethylhexyl) phthalate	<0.25		mg/Kg	EPA 8270C	1	0.25	11/20/11	KZ
4-Bromophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzyl Butyl Phthalate(BBP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloro-3-Methylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloroaniline	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chloronaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 016 **HA-16@0.5-1.0** Date & Time Sampled: 11/15/11 @ 14:18
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
4-Chlorophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Chrysene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Di-n-Butyl Phthalate	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Di-n-Octyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzo(a,h)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzofuran	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,3-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,4-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3,3-Dichlorobenzidine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Diethyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dimethyl Phthalate(DEP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dimethylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methyl-4,6-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,6-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluorene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobutadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorocyclopentadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachloroethane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Indeno(1,2,3-c,d)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Isophorone	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylnaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3/4-Methylphenol(Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylphenol(o-Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Naphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ

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CERTIFICATE OF ANALYSIS

1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 016 **HA-16@0.5-1.0**					Date & Time Sampled:		11/15/11 @ 14:18	
Sample Matrix: **Solid**								
.....continued								
3-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
4-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Nitrobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitrophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Nitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
n-Nitrosodi-n-Propylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
n-Nitroso-Diphenylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pentachlorophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Phenanthrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Phenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2,4-Trichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,5-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,6-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
[Semi-Volatile Surrogates]								
2-Fluorophenol	59		%REC	EPA 8270C		25-121	11/20/11	KZ
Phenol-D5	60		%REC	EPA 8270C		24-113	11/20/11	KZ
Nitrobenzene-D5	71		%REC	EPA 8270C		23-120	11/20/11	KZ
2-Fluorobiphenyl	73		%REC	EPA 8270C		30-115	11/20/11	KZ
2,4,6-Tribromophenol	66		%REC	EPA 8270C		19-122	11/20/11	KZ
p-Terphenyl-D14	62		%REC	EPA 8270C		18-137	11/20/11	KZ
[PCBs]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/18/11	KZ
Aroclor 1016	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1221	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1232	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1242	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1248	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1254	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1260	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
[Surrogates]								

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 016 **HA-16@0.5-1.0** Sample Matrix: **Solid**					Date & Time Sampled:		11/15/11 @ 14:18	
.....continued								
Tetrachloro-m-xylene	80		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Decachlorobiphenyl	86		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Sample: 017 **HA-17@0.5-1.0** Sample Matrix: **Solid**					Date & Time Sampled:		11/15/11 @ 14:24	
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/18/11	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Arsenic	**1.10**		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Barium	**48.8**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Chromium	**7.29**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cobalt	**4.38**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Copper	**10.2**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Lead	**2.26**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Nickel	**6.88**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Selenium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Vanadium	**18.9**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Zinc	**21.9**		mg/Kg	EPA 6010B	1	5.00	11/18/11	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1		11/20/11	KZ
Mercury	**0.174**		mg/Kg	EPA 7471A	1	0.0200	11/20/11	KZ
[Semi-Volatile Organics]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/20/11	KZ
Acenaphthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Acenaphthylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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Project: AECOM-DEVORE INTERCHANGE

Sample: 017 **HA-17@0.5-1.0** Date & Time Sampled: 11/15/11 @ 14:24
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Benzo(a)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(b)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(g,h,i)perylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(k)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethoxy)methane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethyl) ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroisopropyl)ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Ethylhexyl) phthalate	<0.25		mg/Kg	EPA 8270C	1	0.25	11/20/11	KZ
4-Bromophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzyl Butyl Phthalate(BBP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloro-3-Methylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloroaniline	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chloronaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chlorophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Chrysene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Di-n-Butyl Phthalate	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Di-n-Octyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzo(a,h)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzofuran	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,3-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,4-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3,3-Dichlorobenzidine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Diethyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dimethyl Phthalate(DEP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dimethylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methyl-4,6-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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Invoice No.	66388
Cust #	1003
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Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 017 **HA-17@0.5-1.0** Date & Time Sampled: 11/15/11 @ 14:24
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
2,6-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluorene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobutadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorocyclopentadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachloroethane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Indeno(1,2,3-c,d)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Isophorone	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylnaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3/4-Methylphenol(Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylphenol(o-Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Naphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
3-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
4-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Nitrobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitrophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Nitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
n-Nitrosodi-n-Propylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
n-Nitroso-Diphenylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pentachlorophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Phenanthrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Phenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2,4-Trichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,5-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,6-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
[Semi-Volatile Surrogates]								
2-Fluorophenol	82		%REC	EPA 8270C		25-121	11/20/11	KZ
Phenol-D5	76		%REC	EPA 8270C		24-113	11/20/11	KZ

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Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 017 **HA-17@0.5-1.0**					Date & Time Sampled:		11/15/11 @ 14:24	
Sample Matrix: **Solid**								
.....continued								
Nitrobenzene-D5	67		%REC	EPA 8270C		23-120	11/20/11	KZ
2-Fluorobiphenyl	73		%REC	EPA 8270C		30-115	11/20/11	KZ
2,4,6-Tribromophenol	70		%REC	EPA 8270C		19-122	11/20/11	KZ
p-Terphenyl-D14	64		%REC	EPA 8270C		18-137	11/20/11	KZ
[PCBs]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/18/11	KZ
Aroclor 1016	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1221	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1232	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1242	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1248	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1254	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1260	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
[Surrogates]								
Tetrachloro-m-xylene	66		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Decachlorobiphenyl	72		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Sample: 018 **HA-18@0.5-1.0**					Date & Time Sampled:		11/15/11 @ 14:32	
Sample Matrix: **Solid**								
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3050B	1		11/18/11	TLB
Antimony	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Arsenic	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Barium	**41.9**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Beryllium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cadmium	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Chromium	**6.20**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Cobalt	**4.45**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Copper	**8.75**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Lead	**2.21**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Molybdenum	<0.500		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Nickel	**6.18**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB

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1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 018 **HA-18@0.5-1.0** Date & Time Sampled: 11/15/11 @ 14:32
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Selenium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Silver	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Thallium	<1.00		mg/Kg	EPA 6010B	1	1.00	11/18/11	TLB
Vanadium	**18.0**		mg/Kg	EPA 6010B	1	0.500	11/18/11	TLB
Zinc	**21.7**		mg/Kg	EPA 6010B	1	5.00	11/18/11	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7471A	1		11/20/11	KZ
Mercury	**0.245**		mg/Kg	EPA 7471A	1	0.0200	11/20/11	KZ
[Semi-Volatile Organics]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/20/11	KZ
Acenaphthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Acenaphthylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(a)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(b)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(g,h,i)perylene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzo(k)fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethoxy)methane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroethyl) ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Chloroisopropyl)ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
bis(2-Ethylhexyl) phthalate	<0.25		mg/Kg	EPA 8270C	1	0.25	11/20/11	KZ
4-Bromophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Benzyl Butyl Phthalate(BBP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloro-3-Methylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chloroaniline	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chloronaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Chlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Chlorophenyl Phenyl Ether	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Chrysene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Di-n-Butyl Phthalate	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 018 **HA-18@0.5-1.0** Date & Time Sampled: 11/15/11 @ 14:32
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Di-n-Octyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzo(a,h)anthracene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dibenzofuran	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,3-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,4-Dichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3,3-Dichlorobenzidine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Diethyl Phthalate	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Dimethyl Phthalate(DEP)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4-Dimethylphenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methyl-4,6-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
2,4-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,6-Dinitrotoluene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluoranthene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Fluorene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorobutadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachlorocyclopentadiene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Hexachloroethane	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Indeno(1,2,3-c,d)pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Isophorone	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylnaphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
3/4-Methylphenol(Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Methylphenol(o-Cresol)	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Naphthalene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
3-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
4-Nitroaniline	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Nitrobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ

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ANNE PEREZ
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REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 018 **HA-18@0.5-1.0**					Date & Time Sampled:		11/15/11 @ 14:32	
Sample Matrix: **Solid**								
.....continued								
2-Nitrophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
4-Nitrophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
n-Nitrosodi-n-Propylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
n-Nitroso-Diphenylamine	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pentachlorophenol	<0.10		mg/Kg	EPA 8270C	1	0.10	11/20/11	KZ
Phenanthrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Phenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
Pyrene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
1,2,4-Trichlorobenzene	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,5-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
2,4,6-Trichlorophenol	<0.025		mg/Kg	EPA 8270C	1	0.025	11/20/11	KZ
[Semi-Volatile Surrogates]								
2-Fluorophenol	87		%REC	EPA 8270C		25-121	11/20/11	KZ
Phenol-D5	82		%REC	EPA 8270C		24-113	11/20/11	KZ
Nitrobenzene-D5	69		%REC	EPA 8270C		23-120	11/20/11	KZ
2-Fluorobiphenyl	72		%REC	EPA 8270C		30-115	11/20/11	KZ
2,4,6-Tribromophenol	73		%REC	EPA 8270C		19-122	11/20/11	KZ
p-Terphenyl-D14	80		%REC	EPA 8270C		18-137	11/20/11	KZ
[PCBs]								
Ultrasonic Extraction	Complete			EPA 3550	1		11/18/11	KZ
Aroclor 1016	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1221	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1232	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1242	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1248	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1254	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
Aroclor 1260	<0.050		mg/Kg	EPA 8082	1	0.050	11/19/11	KZ
[Surrogates]								
Tetrachloro-m-xylene	73		%REC	EPA 8081A/8082		50-150	11/19/11	KZ
Decachlorobiphenyl	70		%REC	EPA 8081A/8082		50-150	11/19/11	KZ

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REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 019 **EBQC-2**					Date & Time Sampled:		11/15/11 @ 15:45	
Sample Matrix: **Aqueous**								
[Metals Title 22 no Hg]								
Metals Acid Digestion	Complete			EPA 3010A	2		11/16/11	TLB
Antimony	<0.0200		mg/L	EPA 6010B	1	0.0200	11/17/11	TLB
Arsenic	<0.0200		mg/L	EPA 6010B	1	0.0200	11/17/11	TLB
Barium	<0.0100		mg/L	EPA 6010B	1	0.0100	11/17/11	TLB
Beryllium	<0.00500		mg/L	EPA 6010B	1	0.00500	11/17/11	TLB
Cadmium	<0.00500		mg/L	EPA 6010B	1	0.00500	11/17/11	TLB
Chromium	<0.0100		mg/L	EPA 6010B	1	0.0100	11/17/11	TLB
Cobalt	<0.00500		mg/L	EPA 6010B	1	0.00500	11/17/11	TLB
Copper	<0.0100		mg/L	EPA 6010B	1	0.0100	11/17/11	TLB
Lead	<0.0200		mg/L	EPA 6010B	1	0.0200	11/17/11	TLB
Molybdenum	<0.0200		mg/L	EPA 6010B	2	0.0200	11/16/11	TLB
Nickel	<0.0100		mg/L	EPA 6010B	1	0.0100	11/17/11	TLB
Selenium	<0.0200		mg/L	EPA 6010B	1	0.0200	11/17/11	TLB
Silver	<0.0400		mg/L	EPA 6010B	2	0.0400	11/16/11	TLB
Thallium	<0.100		mg/L	EPA 6010B	1	0.100	11/17/11	TLB
Vanadium	<0.0100		mg/L	EPA 6010B	1	0.0100	11/17/11	TLB
Zinc	<0.0400		mg/L	EPA 6010B	1	0.0400	11/17/11	TLB
[Mercury]								
Mercury Digestion	Complete			EPA 7470A	1		11/16/11	KZ
Mercury	<0.000200		mg/L	EPA 7470A	1	0.000200	11/16/11	KZ
[Semi-Volatile Organics]								
Sep Funnel LLE	Complete			EPA 3510C	1		11/19/11	KZ
bis(2-Chloroethyl) ether	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Phenol	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
2-Chlorophenol	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
1,3-Dichlorobenzene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
1,4-Dichlorobenzene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
1,2-Dichlorobenzene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
bis(2-Chloroisopropyl)ether	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Hexachloroethane	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
n-Nitrosodi-n-Propylamine	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ

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Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 019 **EBQC-2** Date & Time Sampled: 11/15/11 @ 15:45
Sample Matrix: **Aqueous**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Nitrobenzene	<0.0030		mg/L	EPA 8270C	1	0.0030	11/19/11	KZ
Isophorone	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
2-Nitrophenol	<0.0040		mg/L	EPA 8270C	1	0.0040	11/19/11	KZ
2,4-Dimethylphenol	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
bis(2-Chloroethoxy)methane	<0.0020		mg/L	EPA 8270C	1	0.0020	11/19/11	KZ
2,4-Dichlorophenol	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
1,2,4-Trichlorobenzene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Naphthalene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
4-Chloroaniline	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Hexachlorobutadiene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
4-Chloro-3-Methylphenol	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Hexachlorocyclopentadiene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
2,4,6-Trichlorophenol	<0.010		mg/L	EPA 8270C	1	0.010	11/19/11	KZ
2-Chloronaphthalene	<0.019		mg/L	EPA 8270C	1	0.019	11/19/11	KZ
Dimethyl Phthalate(DEP)	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Acenaphthylene	<0.0010		mg/L	EPA 8270C	1	0.0010	11/19/11	KZ
2,6-Dinitrotoluene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Acenaphthene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
2,4-Dinitrophenol	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
4-Nitrophenol	<0.010		mg/L	EPA 8270C	1	0.010	11/19/11	KZ
2,4-Dinitrotoluene	<0.048		mg/L	EPA 8270C	1	0.048	11/19/11	KZ
Fluorene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Diethyl Phthalate	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
4-Chlorophenyl Phenyl Ether	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
2-Methyl-4,6-Dinitrophenol	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
n-Nitroso-Diphenylamine	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
4-Bromophenyl Phenyl Ether	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Hexachlorobenzene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Pentachlorophenol	<0.048		mg/L	EPA 8270C	1	0.048	11/19/11	KZ
Anthracene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Phenanthrene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ

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FDA#	2030513
LA City#	10261
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CERTIFICATE OF ANALYSIS

1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Sample: 019 **EBQC-2** Date & Time Sampled: 11/15/11 @ 15:45
Sample Matrix: **Aqueous**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Di-n-Butyl Phthalate	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Fluoranthene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Pyrene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Benzyl Butyl Phthalate(BBP)	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Benzo(a)anthracene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
3,3-Dichlorobenzidine	<0.048		mg/L	EPA 8270C	1	0.048	11/19/11	KZ
bis(2-Ethylhexyl) phthalate	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Chrysene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Di-n-Octyl Phthalate	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Benzo(b)fluoranthene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Benzo(k)fluoranthene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Benzo(a)pyrene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Indeno(1,2,3-c,d)pyrene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Dibenzo(a,h)anthracene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Benzo(g,h,i)perylene	<0.0095		mg/L	EPA 8270C	1	0.0095	11/19/11	KZ
Dibenzofuran	<0.0010		mg/L	EPA 8270C	1	0.0010	11/19/11	KZ
2-Methylnapthalene	<0.0010		mg/L	EPA 8270C	1	0.0010	11/19/11	KZ
3/4-Methylphenol(Cresol)	<0.0050		mg/L	EPA 8270C	1	0.0050	11/19/11	KZ
2-Methylphenol(o-Cresol)	<0.0050		mg/L	EPA 8270C	1	0.0050	11/19/11	KZ
2-Nitroaniline	<0.0030		mg/L	EPA 8270C	1	0.0030	11/19/11	KZ
3-Nitroaniline	<0.0030		mg/L	EPA 8270C	1	0.0030	11/19/11	KZ
4-Nitroaniline	<0.010		mg/L	EPA 8270C	1	0.010	11/19/11	KZ
2,4,5-Trichlorophenol	<0.0060		mg/L	EPA 8270C	1	0.0060	11/19/11	KZ
[Semi-Volatile Surrogates]								
2-Fluorophenol	69		%REC	EPA 8270C		10-124	11/19/11	KZ
Phenol-D5	72		%REC	EPA 8270C		10-97.5	11/19/11	KZ
Nitrobenzene-D5	73		%REC	EPA 8270C		10-139	11/19/11	KZ
2-Fluorobiphenyl	79		%REC	EPA 8270C		5-91.4	11/19/11	KZ
2,4,6-Tribromophenol	64		%REC	EPA 8270C		10-107	11/19/11	KZ
p-Terphenyl-D14	62		%REC	EPA 8270C		10-157	11/19/11	KZ
[PCBs]								

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CERTIFICATE OF ANALYSIS

1111-00116

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	11/22/11
Date Received	11/16/11
Invoice No.	66388
Cust #	1003
Permit Number	
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 019 **EBQC-2**					Date & Time Sampled:		11/15/11 @ 15:45	
Sample Matrix: **Aqueous**								
.....continued								
Sep Funnel LLE	Complete			EPA 3510C	1		11/19/11	KZ
Aroclor 1016	<0.50		µg/L	EPA 8082	1	0.50	11/18/11	KZ
Aroclor 1221	<0.50		µg/L	EPA 8082	1	0.50	11/18/11	KZ
Aroclor 1232	<0.50		µg/L	EPA 8082	1	0.50	11/18/11	KZ
Aroclor 1242	<0.50		µg/L	EPA 8082	1	0.50	11/18/11	KZ
Aroclor 1248	<0.50		µg/L	EPA 8082	1	0.50	11/18/11	KZ
Aroclor 1254	<0.50		µg/L	EPA 8082	1	0.50	11/18/11	KZ
Aroclor 1260	<0.50		µg/L	EPA 8082	1	0.50	11/18/11	KZ
[Surrogates]								
Tetrachloro-m-xylene	76		%REC	EPA 8081A/8082		50-150	11/18/11	KZ
Decachlorobiphenyl	80		%REC	EPA 8081A/8082		50-150	11/18/11	KZ

Respectfully Submitted: Ken Zheng

Ken Zheng - President

QUALIFIERS

B = Detected in the associated Method Blank at a concentration above the routine RL.
B1 = BOD dilution water is over specifications . The reported result may be biased high.
D = Surrogate recoveries are not calculated due to sample dilution.
E = Estimated value; Value exceeds calibration level of instrument.
H = Analyte was prepared and/or analyzed outside of the analytical method holding time
I = Matrix Interference.
J = Analyte concentration detected between RL and MDL.
Q = One or more quality control criteria did not meet specifications. See Comments for further explanation.
S = Customer provided specification limit exceeded.

ABBREVIATIONS

DF = Dilution Factor
RL = Reporting Limit, Adjusted by DF
MDL = Method Detection Limit, Adjusted by DF
Qual = Qualifier
Tech = Technician

As regulatory limits change frequently, A & R Laboratories advises the recipient of this report to confirm such limits with the appropriate federal, state, or local authorities before acting in reliance on the regulatory limits provided.

For any feedback concerning our services, please contact Marilu Escher, Project Manager at 951.779.0310. You may also contact Ken Zheng, President at arlab@arlaboratories.com.

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QUALITY CONTROL DATA REPORT

1111-00116

STANTEC
REDLANDS, CA 92374-4515

Date Reported	**11/22/2011**
Date Received	**11/16/2011**
Date Sampled	**11/15/2011**
Invoice No.	**66388**
Customer #	**1003**
Customer P.O.	

Project: AECOM-DEVORE INTERCHANGE

Method # EPA 6010B

QC Reference # 32366 **Date Analyzed:** 11/17/2011 **Technician:** TLB

Samples 001 019

Results

	LCS %REC	LCS %DUP	LCS %RPD
Antimony	100	95	5.4
Arsenic	109	107	1.4
Barium	105	106	1.2
Beryllium	109	108	0.4
Cadmium	109	108	1.5
Chromium	105	104	1.5
Cobalt	106	105	1.0
Copper	101	99	2.4
Lead	101	100	0.9
Molybdenum	100	96	3.8
Nickel	107	106	1.6
Selenium	122	119	2.1
Silver	101	101	0.3
Thallium	111	109	2.0
Vanadium	101	100	1.0
Zinc	113	112	1.3

Control Ranges

LCS %REC	LCS %RPD
75 - 125	0 - 20
75 - 125	0 - 20
75 - 125	0 - 20
75 - 125	0 - 20
75 - 125	0 - 20
75 - 125	0 - 20
75 - 125	0 - 20
75 - 125	0 - 20
75 - 125	0 - 20
75 - 125	0 - 20
75 - 125	0 - 20
75 - 125	0 - 25
75 - 125	0 - 20
75 - 125	0 - 20
75 - 125	0 - 20
75 - 125	0 - 20
75 - 125	0 - 20

QC Reference # 32395 **Date Analyzed:** 11/18/2011 **Technician:** TLB

Samples 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017 018

Results

	LCS %REC	LCS %DUP	LCS %RPD	SPIKE %REC	SPIKE %DUP	SPIKE %RPD
Antimony	100	96	3.4	84	86	2.4
Arsenic	107	104	2.7	92	95	3.4
Barium	109	105	3.1	200	183	8.8
Beryllium	107	103	3.9	90	93	3.5
Cadmium	108	104	3.3	82	87	5.6
Chromium	106	102	3.5	119	118	0.9
Cobalt	109	105	3.6	102	107	4.7
Copper	105	101	3.7	223	187	17.4
Lead	107	104	3.1	145	129	11.9
Molybdenum	106	104	1.7	84	92	8.3
Nickel	108	105	2.9	204	193	5.5
Selenium	112	109	3.4	87	91	5.2
Silver	115	110	4.0	105	106	1.4
Thallium	110	105	4.3	76	80	5.5
Vanadium	105	101	4.3	120	118	1.1
Zinc	113	109	3.9	286	226	23.5

Control Ranges

LCS %REC	LCS %RPD	SPIKE %RPD
75 - 125	0 - 20	0 - 20
75 - 125	0 - 20	0 - 20
75 - 125	0 - 20	0 - 20
75 - 125	0 - 20	0 - 20
75 - 125	0 - 20	0 - 20
75 - 125	0 - 20	0 - 20
75 - 125	0 - 20	0 - 20
75 - 125	0 - 20	0 - 20
75 - 125	0 - 20	0 - 20
75 - 125	0 - 20	0 - 20
75 - 125	0 - 20	0 - 20
75 - 125	0 - 20	0 - 20
75 - 125	0 - 20	0 - 20
75 - 125	0 - 20	0 - 20
75 - 125	0 - 20	0 - 20
75 - 125	0 - 20	0 - 20
75 - 125	0 - 20	0 - 20

Method # EPA 7470A

QC Reference # 32386 **Date Analyzed:** 11/16/2011 **Technician:** KZ

Samples 001 019

Results

	LCS %REC	LCS %DUP	LCS %RPD
Mercury	90	95	7

Control Ranges

LCS %REC	LCS %RPD
75 - 125	0 - 25

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QUALITY CONTROL DATA REPORT

STANTEC **1111-00116**

Date Reported 11/22/2011
Date Received 11/16/2011
Date Sampled 11/15/2011

Project: AECOM-DEVORE INTERCHANGE

Method # EPA 7471A
QC Reference # 32412 **Date Analyzed:** 11/20/2011 **Technician:** KZ
Samples 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017 018

Results

	LCS %REC	LCS %DUP	LCS %RPD
Mercury	87	85	5

Control Ranges

LCS %REC	LCS %RPD
75 - 125	0 - 25

Method # EPA 8081A/8082
QC Reference # 32421 **Date Analyzed:** 11/19/2011 **Technician:** KZ
Samples 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017 018

Results

	BLKSRR%REC
Decachlorobiphenyl	72
Tetrachloro-m-xylene	76

Control Ranges

BLKSRR%REC
50 - 150
50 - 150

QC Reference # 32423 **Date Analyzed:** 11/18/2011 **Technician:** KZ
Samples 001 019

No QC recoveries reported.

Method # EPA 8082
QC Reference # 32421 **Date Analyzed:** 11/19/2011 **Technician:** KZ
Samples 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017 018

Results

	LCS %REC	LCS %DUP	LCS %RPD
Aroclor 1016	83	90	9

Control Ranges

LCS %REC	LCS %RPD
70 - 130	0 - 25

QC Reference # 32423 **Date Analyzed:** 11/18/2011 **Technician:** KZ
Samples 001 019

Results

	LCS %REC	LCS %DUP	LCS %RPD
Aroclor 1016	81	86	7

Control Ranges

LCS %REC	LCS %RPD
70 - 130	0 - 25

Method # EPA 8270C
QC Reference # 32458 **Date Analyzed:** 11/20/2011 **Technician:** KZ
Samples 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017 018

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QUALITY CONTROL DATA REPORT

STANTEC **1111-00116**

Date Reported 11/22/2011
Date Received 11/16/2011
Date Sampled 11/15/2011

Project: AECOM-DEVORE INTERCHANGE

Method # EPA 8270C

QC Reference # 32458 **Date Analyzed:** 11/20/2011 **Technician:** KZ

Samples 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016 017 018

Results

	LCS %REC	LCS %DUP	LCS %RPD	BLKSRR%REC
1,2,4-Trichlorobenzen	81	87	6	
1,4-Dichlorobenzene	83	92	11	
2,4,6-Tribromophenol				75
2,4-Dinitrotoluene	87	86	2	
2-Chlorophenol	90	89	3	
2-Fluorobiphenyl				80
2-Fluorophenol				73
4-Chloro-3-Methylphe	97	83	16	
4-Nitrophenol	83	91	10	
Acenaphthene	90	85	6	
Nitrobenzene-D5				69
n-Nitrosodi-n-Propylam	91	93	3	
Pentachlorophenol	83	84	2	
Phenol	84	85	3	
Phenol-D5				70
p-Terphenyl-D14				68
Pyrene	93	91	2	

Control Ranges

LCS %REC	LCS %RPD	BLKSRR%REC
35 - 100	0 - 25	
35 - 105	0 - 25	
		10 - 107
50 - 130	0 - 25	
35 - 105	0 - 25	
		10 - 124
		5 - 91
40 - 100	0 - 25	
45 - 140	0 - 25	
40 - 110	0 - 25	
		10 - 139
50 - 130	0 - 25	
50 - 150	0 - 25	
35 - 100	0 - 25	
		10 - 98
		10 - 157
35 - 140	0 - 25	

QC Reference # 32459 **Date Analyzed:** 11/19/2011 **Technician:** KZ

Samples 001 019

Results

	LCS %REC	LCS %DUP	LCS %RPD	BLKSRR%REC
1,2,4-Trichlorobenzen	69	67	5	
1,4-Dichlorobenzene	73	89	19	
2,4,6-Tribromophenol				72
2,4-Dinitrotoluene	76	74	3	
2-Chlorophenol	69	86	19	
2-Fluorobiphenyl				83
2-Fluorophenol				66
4-Chloro-3-Methylphe	78	66	18	
4-Nitrophenol	64	60	6	
Acenaphthene	79	86	8	
Nitrobenzene-D5				79
n-Nitrosodi-n-Propylam	84	70	15	
Pentachlorophenol	83	86	6	
Phenol	60	80	20	
Phenol-D5				69
p-Terphenyl-D14				84
Pyrene	73	76	5	

Control Ranges

LCS %REC	LCS %RPD	BLKSRR%REC
44 - 142	0 - 28	
20 - 124	0 - 27	
		19 - 122
39 - 139	0 - 47	
23 - 134	0 - 50	
		43 - 116
		21 - 100
22 - 147	0 - 33	
0 - 132	0 - 50	
47 - 145	0 - 23	
		35 - 114
0 - 230	0 - 38	
14 - 176	0 - 47	
5 - 112	0 - 35	
		10 - 94
		33 - 141
52 - 115	0 - 36	

Method blank results

Ref	Test Name	Result	Qualif	Units
32366	Antimony	***0.00965***		mg/L
	Arsenic	***0.00646***		mg/L
	Selenium	***0.0135***		mg/L
	Thallium	***0.0138***		mg/L
	Arsenic	***0.304***		mg/Kg
	Selenium	***0.489***		mg/Kg

Ref	Test Name	Result	Qualif	Units

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QUALITY CONTROL DATA REPORT

1111-00116

STANTEC

Date Reported **11/22/2011**
Date Received **11/16/2011**
Date Sampled **11/15/2011**

Project: AECOM-DEVORE INTERCHANGE

Respectfully Submitted: Ken Zheng

Ken Zheng - President

For any feedback concerning our services, please contact Marilu Escher, Project Manager at 951.779.0310. You may also contact Ken Zheng, President at arlab@arlaboratories.com.

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Centrum Analytical Laboratories, Inc.

Chain of Custody Record

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www.centrum-labs.com lab@centrum-labs.com

Project No:	Project Name:
185802352	AECOM - Devore

Project Manager:	Phone:	Fax:
Anne Perez	909-335-6116	909-335-6120

Client Name: (Report and Billing)	Address: (Report and Billing)
Stantec 25864-F Business Center Dr. Redlands, CA 92374	same

Please Circle Analyses Requested

Centrum ID (Lab use only)	Sample ID (As it should appear on report)	Date sampled	Time sampled	Sample matrix	Site location	Containers: # and type	TITLE 22 METALS - 6010B	SVOC - 8270	PCB - 8082	Remarks/Special Instructions
1	EBQC-1	11/15/11	0915	H2O		1POLY 2AMBERS	X	X	X	
2	HA-3@0.5-1.0	11/15/11	1020	SOIL		1 JAR	X	X	X	
3	HA-3@1.5-2.0	11/15/11	1022	SOIL		1 JAR	X	X	X	
4	HA-8@0.5-1.0	11/15/11	1247	SOIL		1 JAR	X	X	X	
5	HA-8@1.5-2.0	11/15/11	1249	SOIL		1 JAR	X	X	X	
6	HA-11@0.5-1.0	11/15/11	1313	SOIL		1 BAG	X	X	X	
7	HA-11@1.5-2.0	11/15/11	1322	SOIL		1 BAG	X	X	X	
8	HA-12@0.5-1.0	11/15/11	1346	SOIL		1 BAG	X	X	X	
9	HA-12@1.5-2.0	11/15/11	1348	SOIL		1 BAG	X	X	X	
10	HA-13@0.5-1.0	11/15/11	1352	SOIL		1 BAG	X	X	X	
11	HA-13@1.5-2.0	11/15/11	~~1345~~ 1352	SOIL		1 BAG	X	X	X	per Anne 11/17/11 2:30^
12	HA-14@0.5-1.0	11/15/11	1400	SOIL		1 BAG	X	X	X	
13	HA-14@1.5-2.0	11/15/11	1403	SOIL		1 BAG	X	X	X	
14	HA-15@0.5-1.0	11/15/11	1408	SOIL		1 BAG	X	X	X	
15	HA-15@1.5-2.0	11/15/11	1410	SOIL		1 BAG	X	X	X	

Turn-Around Time

- o 24 Hr. RUSH*
- o 48 Hr. RUSH*
- o Normal TAT

*Requires PRIOR approval, additional charges apply

Requested due date: _____

1) Relinquished By: (Sampler's Signature)	Date: 11/16/11	Time: 1040	3) Relinquished by:	Date:	Time:
2) Received by:	Date:	Time:	4) Received by:	Date:	Time:
			5) Relinquished by:	Date:	Time:
			6) Received for Laboratory by:	Date: 11/16/11	Time: 1040

The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the Terms and Conditions set forth on the back hereof.

To be completed by Laboratory personnel:

- Samples chilled? x Yes o No o From Field
- Custody seals? o Yes x No
- All sample containers intact? x Yes o No
- o Courier o UPS/Fed Ex x Hand carried

Sample Disposal

- o Client will pick up
- o Return to client
- o Lab disposal

Laboratory Notes:

Sample Locator No.

v8.0 1/01 coc-temp-both.xls

White Copy - Original (Accompanies Samples) Yellow Copy - Centrum Files Pink Copy - Centrum duplicate Gold Copy - Client Copy

Centrum Analytical Laboratories, Inc.

Chain of Custody Record

1111- 116

1401 Research Park Drive, Suite 100
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Fax: 951.779.0344

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www.centrum-labs.com lab@centrum-labs.com

Project No:	Project Name:
185802352	AECOM - Devore

Project Manager:	Phone:	Fax:
Anne Perez	909-335-6116	909-335-6120

Client Name: (Report and Billing)	Address: (Report and Billing)
Stantec 25864- F Business Center Dr. Redlands, CA 92374	same

Please Circle Analyses Requested

Centrum ID (Lab use only)	Sample ID (As it should appear on report)	Date sampled	Time sampled	Sample matrix	Site location	Containers: # and type	TITLE 22 METALS - 6010B	SVOC - 8270	PCB - 8082	Remarks/Special Instructions
16	HA-16@0.5-1.0	11/15/11	1418	SOIL		1 BAG	X	X	X	
17	HA-17@0.5-1.0	11/15/11	1424	SOIL		1 BAG	X	X	X	
18	HA-18@0.5-1.0	11/15/11	1432	SOIL		1 BAG	X	X	X	
19	EBQC-2	11/15/11	1545	H2O		1POLY 2AMBER	X	X	X	

Turn-Around Time

- o 24 Hr. RUSH*
- o 48 Hr. RUSH*
- o Normal TAT

*Requires PRIOR approval, additional charges apply

Requested due date: _____

1) Relinquished by: (Sampler's Signature)	Date: 11/16/11	Time: 1040	3) Relinquished by:	Date:	Time:
2) Received by:	Date:	Time:	4) Received by:	Date:	Time:
			5) Relinquished by:	Date:	Time:
The delivery of samples and the signature on this chain of custody form constitutes authorization to perform the analyses specified above under the Terms and Conditions set forth on the back hereof.			6) Received for Laboratory by:	Date: 11/16/11	Time: 1040

To be completed by Laboratory personnel:

Samples chilled? o Yes o No o From Field

Custody seals? o Yes o No

All sample containers intact? o Yes o No

o Courier o UPS/Fed Ex o Hand carried

Sample Disposal

- o Client will pick up
- o Return to client
- o Lab disposal

Laboratory Notes:

Sample Locator No.

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PRELIMINARY SITE INVESTIGATION (PSI) REPORT
FORMER MOBIL SERVICE STATION (PSI-3)
I-15/I-215 Interchange Improvements Project
San Bernardino County, California

Prepared for:
AECOM
901 Via Piemonte, 5th Floor
Ontario, California 91764

Prepared by:
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25864 Business Center Drive, Suite F
Redlands, California 92374

December 27, 2011

DRAFT

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1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION AND OBJECTIVES

At the request of AECOM and pursuant to the scope of work outlined in the revised work plan dated October 20, 2011, Stantec Consulting Corporation (Stantec) has prepared this report to present the results, findings and conclusions of a Preliminary Site Assessment (PSI) conducted to investigate potential recognized environmental concerns (RECs) identified within the proposed reconstruction area of sections of roadway/highway and select properties along the I-215/I-15 Interchange project in the Devore area of San Bernardino County, California (Figure 1).

According to site design plans, the construction of Alternative 3A will require procurement of new right-of-way (ROW) and expansion of freeway off-ramps encroaching on an existing Caltrans property which was formerly operated as a Mobil service station located on the northwest corner of Devore Road with Arrowhead Road at the Devore Road exit from the northbound Interstate-215 (refer to Figure 1). The parcel number formerly assigned to the Site was 0349-153-05-06. According to the San Bernardino County Assessor's office staff, the parcel was transferred to the California Department of Transportation (Caltrans) and incorporated into the highway easement, as a result, currently there is no longer a parcel number associated with this Site. As part of due diligence activities under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), this PSI was conducted to evaluate potential environmental concerns in the construction zone within the construction area on the former Mobil property.

The former Mobil was identified as a REC in the following documents:

- Initial Site Assessment (ISA), prepared by LSA Associates, Inc., dated February 2010;
- Chapter 2.12.4 of the I-15/I-215 Interchange Improvements Project Initial Study/Environmental Assessment and Table 2.3-G (provided by AECOM, LSA, 2011);
- ADL and Environmental Site Assessment (ESA), prepared by Stantec, dated March 10, 2011; and the
- Alternative 3A Parcel Complexity Map (provided by AECOM)

The following sections describe the methodology, findings, and conclusions of the PSI performed to assess potential environmental concerns. Also included is a summary of field sampling activities, laboratory test results, and recommendations for soil management during construction activities.

1.2 SCOPE-OF-WORK

The scope of the PSI consisted of the following general elements:

- Pre-field activities - project assessment and Health and Safety Plan (HASP) development
- Geophysical surveys - to identify underground utilities at proposed drilling locations
- Field Sampling Activities –
    - Scope of investigation
    - Drilling - Direct Push Technology (DPT) borehole drilling
    - Soil sampling

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    - Decontamination
- Laboratory analysis

Each of these is discussed in detail in the following subsections.

1.2.1 Pre-Field Activities

Site plans provided by AECOM were reviewed and compared to actual field conditions during a drive-by site reconnaissance. From this preliminary site evaluation and through discussions with AECOM, potential sample locations were designated on the plans. In addition, a site-specific HASP was developed in accordance with California Occupational Safety and Health Administration (Cal OSHA) requirements to guide field activities.

1.2.2 Geophysical Surveys

A geophysical survey was conducted at the PSI location to evaluate the subsurface for potentially buried underground storage tanks (USTs), assist in placing the borings, and as an additional precautionary measure to identify and avoid damaging underground utilities.

Two complimentary surface geophysical instruments (ground penetrating radar (GPR) and electromagnetics (EM)) were used to evaluate the potential presence of buried objects within the site boundaries. These instruments may detect the presence of objects buried as deep as 5 to 13 feet. The effectiveness of these geophysical survey techniques depends on a number of factors including geometry and composition of the buried object, burial depth, surface cover, soil type and density, hydrogeology, and potential interference from surrounding cultural features (e.g., fences, buildings, etc.). These limitations must be considered in the decision making process.

The geophysical survey did not indicate the presence of a UST at the former Mobil site. However, an anomaly in the suspected area of the former USTs was mapped at the Site. Although the anomaly did not exhibit the typical signature of a UST, the existence of a UST or other structure, given the limitations of GPR and EM, cannot be ruled out. Objects, likely utilities and piping (in some cases exposed at the surface), and other subsurface anomalies, were detected. As a result, some borings were placed at the location of the anomalies to further investigate such areas.

1.2.3 Field Sampling Activities

The scope of field sampling activities consisted of the following:

- Drilling 9 borings using DPT technology to depths of 20 to 25 feet bgs:
    - Two (2) borings (SB-1 and SB-2), one near each suspected former dispenser island location, were advanced to a maximum depth of approximately 20 feet below the ground surface (bgs),
    - Two (2) borings (SB-3 and SB-4) were advanced in the suspected area of the former UST locations to a maximum depth of approximately 25 feet bgs,
    - Three (3) borings (SB-5, SB-8, and SB-9) were advanced at the locations identified during the geophysical survey as anomalies to a depth of approximately 20 feet bgs, and
    - Two (2) additional borings (SB-6 and SB-7) were advanced along the property boundaries (including one in the suspected former garage area) to a total depth of approximately 20 feet bgs.

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- Samples at each location will be collected at 5 foot intervals and screened for VOCs using a PID. Stantec proposes to submit up to three (3) samples from each boring to the laboratory for analysis. Groundwater is expected to be encountered at approximately 50-60'bgs, as a result, no permits are necessary since all borings were terminated well above this depth. All boring locations were approximate as the former structures/features are no longer present on the property.

The field methods used for the site investigation were generally consistent with those proposed in the work plan submitted to AECOM dated October 20, 2011. The proposed sampling locations at the site were accessible and no deviations were necessary, other than minor shifts to avoid conflict with potential underground utilities or other buried structure and shifts to locate a boring in an area of an anomaly identified through the geophysical survey.

The boring location identified as SB-3 was shifted three times due to refusal at a depth of approximately 8 feet below ground surface (bgs). The third location was placed just outside of the mapped anomaly and met with the successful advancement of the boring. This location is consistent with the suspected former UST location and also with an anomaly mapped by the geophysical crew. Refusal to drilling in the first two attempted borings (for SB-3 – refer to Figure 2) occurred within an area of a geophysical anomaly. Although the geophysical anomaly did not exhibit the typical signature of an underground storage tank, the existence of a UST, vault or other structure cannot be ruled out. As a result, due to the former site use and the lack of reported evidence of removals at the site, there is a possibility that subsurface structures remain at the site (as indicated by the exposed piping near this anomally. A file record search for parcel number 0349-153-05-06 at the County of San Bernardino Fire Department Hazardous Materials Division did not identify any records regarding the location/removal of USTs on the Site. This parcel number was formerly assigned to the Site. However, according to the County of San Bernardino Assessors Office, a parcel number for this site no longer exists following the transfer of the property to the California Department of Transportation.

Drilling and Soil Sampling

Soil borings were advanced using a DPT drilling rig throughout the site. Prior to DPT drilling, the borings were cleared to five (5) feet using a hand auger. Where sampling intervals occurred in the upper 5 feet, the hand auger was removed from the borehole and the soil contained in the cutter head was removed and placed into a 6-inch stainless steel sleeve preserved by capping each end with a Teflon sheet followed by a tight-fitting plastic cap and sealed with inert tape (containing no volatile organic compounds (VOCs)). The sample sleeves were labeled with the appropriate identification information (boring number, sample depth, sample collection date, and sample collection time), placed into zip-lock baggies, logged on a chain-of-custody form, and stored in an ice-filled cooler for transport to the laboratory for analysis.

Below five feet bgs, a DPT rig equipped with split spoon sampler lined with acetate sample sleeves was used to collect soil samples to evaluate subsurface conditions and the potential for chemical release. Once the sampler was retrieved, one section of sample liner, typically the lower six inches was cut and packaged by capping each end with a Teflon sheet followed by a tight-fitting plastic cap and sealed with non-VOC tape.

All samples were securely labeled, with a self-adhering label containing the sampler's initials, property location, boring I.D., sample I.D., sample depth, sample time and sample date. All samples collected for organic compound analysis were stored in an ice-filled cooler for shipment to the laboratory. All samples were annotated and delivered to the laboratory on chain of custody forms.

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The presence of volatile organic compounds (VOCs) was monitored in the field through headspace measurements using a photoionization detector (PID) calibrated to isobutylene gas. VOC headspace readings were performed by discharging soil from a portion of the acetate sample tube not selected for potential laboratory analysisone of the sample tubes into a re-sealable plastic bag, manually agitating the soil in the bag and then inserting the tip of the PID into the bag. The highest VOC reading was recorded on the field boring logs.

Observed soil and drilling conditions were recorded on field boring logs by the field geologist and include a description of the soil (following USCS classification system), color, moisture content, consistency, odor, staining, groundwater depth, etc. Boring logs are provided in Appendix B.

Decontamination
Prior to advancing borings at each location the drill rods were pressure cleaned. All sampling equipment was cleaned in an Alconox scrub solution and rinsed in a clean tap water and deionized water double rinse. All decontamination liquids and soil were contained on site for waste characterization, profiling and offsite disposal. All containers were labeled to identify the contents and the name and phone number of the Stantec contact.

The scope of field sampling activities for this site is summarized below:

1.2.4 Laboratory Analyses

Select soil samples were submitted under chain-of-custody to A & R Laboratories (A & R, formerly Microbac Laboratories). A & R is certified by the California Environmental Laboratory Accreditation Program (ELAP) to perform the laboratory tests required for this project scope. Selected samples were analyzed for the following analytes:

TPH gasoline, fuel oxygenates and VOCs	EPA test method 8260B
Total Petroleum Hydrocarbons (carbon chain: C12-C40)	EPA test method 8015B

1.3 PREVIOUS SITE INVESTIGATIONS

Stantec was not provided with former environmental reports for this property.

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2.0 INVESTIGATIVE RESULTS

2.1 SUBSURFACE CONDITIONS

Observed subsurface soil conditions are reported on the boring logs provided in Appendix B. The subsurface soils encountered varied throughout the site, but generally consisted of brown to brownish gray, medium-grained sands with silts and some clays and gravels. The soils were relatively dry to slightly moist in the soil column down to the maximum depth of approximately 25 feet bgs. Chemical odors, staining and PID measurements above background were not reported in soil samples.

Groundwater was not encountered to the maximum explored depth of 25 feet bgs.

2.2 ANALYTICAL RESULTS

A total of 17 samples were submitted to the laboratory for chemical analysis. Copies of the laboratory reports and chain-of-custody forms are included in Appendix A. Soil sample analytical results are summarized in Table 1. Based of these results the following are noted

- VOCs were not reported above laboratory reporting limits in analyzed samples.
- Fuel oxygenates were not reported above laboratory reporting limits in analyzed samples.
- TPH-gasoline (TPH-g), TPH-diesel (TPH-d) and TPH-motor oil (TPH-mo) were not detected above laboratory reporting limits in analyzed soil samples.

2.3 DATA VALIDATION

Prior to submitting soil samples to the laboratory, the chain-of-custody documentation was reviewed for accuracy and completeness. The laboratory reports were cross checked with the chain-of-custody forms to confirm accurate transposing of sample information. Laboratory quality assurance and quality control (QA/QC) data (method blanks, laboratory control samples and duplicates, matrix spike samples and duplicates) were also reviewed for compliance with QA/QC objectives. Based on this validation process, the quality of the data contained herein are adequate for the purposes of this study. Laboratory quality control data are attached in Appendix A.

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3.0 CONCLUSIONS AND RECOMMENDATIONS

A PSI was conducted to evaluate potential environmental concerns on a Caltrans-owned parcel (0349-153-05-06) formerly operated as a Mobil gasoline station and located on the northwest corner of Devore Road with Arrowhead Road at the Devore Road exit from the northbound Interstate-215.

A geophysical survey and soil samples were collected to evaluate the potential existence of below grade structures and chemical constituents commonly associated with gasoline service stations. Soil borings were placed in the vicinity of suspected former structures of potential environmental concern (USTs, dispenser islands, service bays) at the former Mobil service station and in the vicinity of geophysical anomalies.

A subsurface structure was encountered during drilling at one of the geophysical anomalies (SB-3). The structure has not been identified. It is recommended that additional investigation be conducted to identify the anomaly using a backhoe. If necessary, the structure should be removed or abandoned in place in accordance with regulatory requirements. Additional sampling and laboratory analysis may be required below the structure if it is a UST or other potential source of chemical release.

Field monitoring and observations did not identify potential evidence of chemical impact. Similarly, laboratory analysis of select soil samples did not report the existence of chemicals of concern (VOCs, fuel oxygenates, TPH-g, TPH-d, and TPH-mo) above laboratory reporting limits.

Other than the additional investigation to identify and remove the potential structure encountered during drilling, and based on the findings of this PSI, it does not appear that a significant release has occurred from the former site operations. However, such findings do not preclude the existence of contamination at other undiscovered or unknown source locations. In the absence of other information, no further investigation appears to be warranted at this time.

General Recommendations for a former gasoline site:

Although no evidence of chemical impact was identified during this PSI, the contractor should be prepared to handle soils impacted by former site operations, should they be encountered during construction. All excavation activities should be performed by a grading contractor possessing an active various locations South Coast Air Quality Management District (SCAQMD) Rule 1166 excavation permit. During construction, stained or odorous soil, if encountered, may be stockpiled for characterization on a portion of the Caltrans property outside the construction zone. This soil should be placed inside bermed, plastic-lined staging areas and covered with plastic when not in active use. If encountered, impacted soils should be managed by the contractor in accordance with the SCAQMD Rule 1166 excavation permit, including proper notification to SCAQMD.

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Any soil considered for off-site re-use or disposal should be stockpiled, sampled and analyzed, at a minimum, for TPH (carbon chain), VOCs, and metals to assure that the soil is suitable for its intended re-use. It is recommended that the suitability of excess soil for potential re-use be evaluated in accordance with the Department of Toxic Substances Control "Information Advisory – Clean Imported Fill Material", dated October 2001. The data may be considered for re-use if the 95 percent Upper Confidence Limit of the mean is less than the Environmental Protection Agency (EPA) Region 9 Regional Screening Levels (RSLs) for each analyte.

Given the history of the site, undiscovered or unknown environmental conditions may be encountered during grading and development of the proposed project. If encountered, additional investigations and removal actions, including underground storage tanks, piping and sumps, may be required at that time. Contaminated soil should be handled, managed and disposed in accordance with Caltrans specifications and requirements.

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4.0 LIST OF PREPARERS

This Preliminary Site Investigation report has been prepared under the direction of the following environmental professionals.

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If you have any questions or comments regarding the information enclosed herein, please contact the undersigned at your convenience.

Respectfully submitted,
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DRAFT

FIGURES

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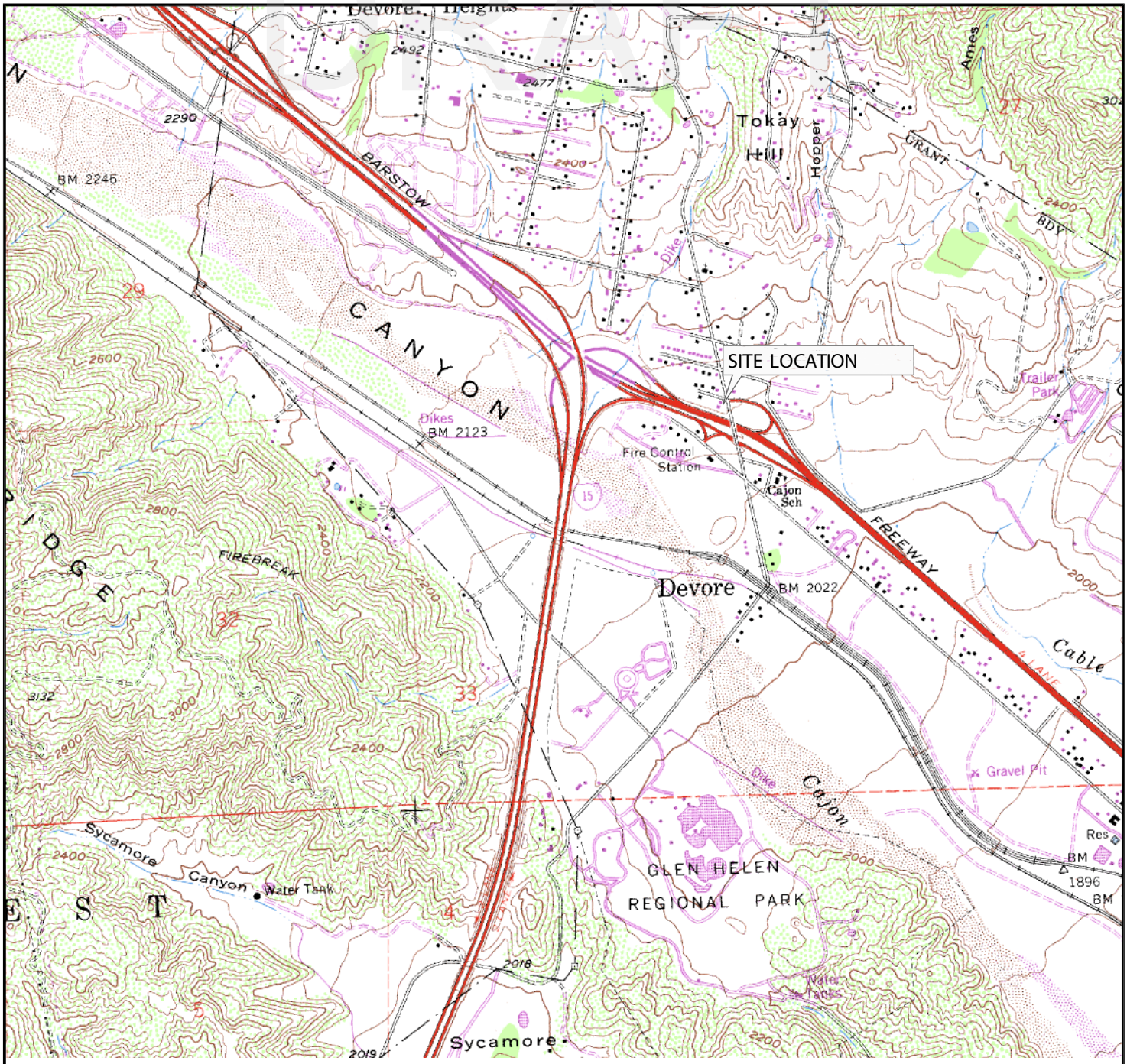

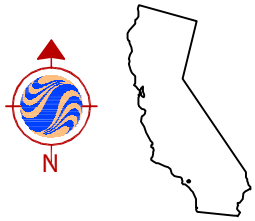

1 1/2 0 1

SCALE IN MILE

1000 0 1000 2000 3000 4000 5000 6000 7000

SCALE IN FEET

REFERENCE: CA Digital Raster Graphics(http://gis.ca.gov/casil/usgs.gov/)
7.5 Minute Series, Albers NAD83, Trimmed
Block o33117e8 & o33117g8, Downloaded 5/14/10

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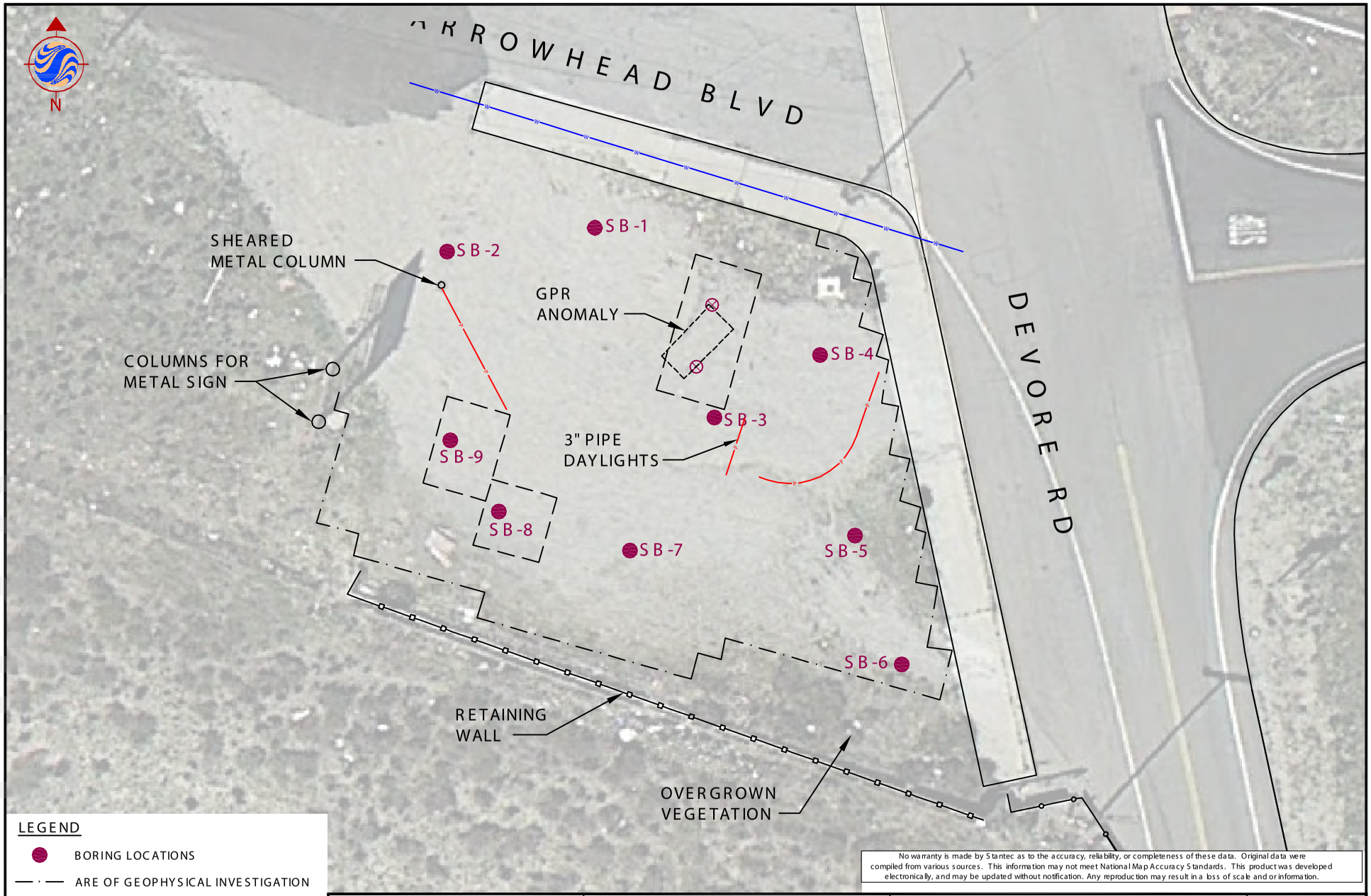
FOR:
AECOM
901 VIA PIEMONTE
5th FLOOR
ONTARIO, CALIFORNIA 91764

CALTRANS (FORMER MOBIL)
RIGHT-OF-WAY (PSI-4)

FIGURE: 1

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185802352	J. RESENDIZ	A. PEREZ		DEC. 2011



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Stantec
25864-F BUSINESS CENTER DRIVE
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FOR:				FIGURE:
AECOM PST-3 ARROWHEAD BLVD AND DEVORE RD DEVORE, CALIFORNIA		SITE PLAN		1
JOB NUMBER: 116927112	DRAWN BY: J. RESENDIZ	CHECKED BY: A. PEREZ	APPROVED BY:	DATE: DEC. 2011

FILEPATH:P:\CADD\PROJECTS\CalTrans\AECOM-LAN\Devore_2011e.dwg| jresendiz| Dec 19, 2011 at 9:26| Layout: 1-SP

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TABLES

TABLE 1
SUMMARY OF SOIL ANALYTICAL RESULTS - Former Mobil Service Station
I-215/I-15 Devore Interchange Project, San Bernardino, CA

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Sample ID[1]	Sample Depth[2]	Sample Date	TPH Reported as Gas/Diesel/Motor Oil Ranges [3]			Volatile Organic Compounds [3] and Fuel Oxygenates
			GAS RANGE HYDROCARBONS (C4-C12)	DIESEL RANGE HYDROCARBONS (C13-C22)	MOTOR OIL RANGE HYDROCARBONS (C23-C40)	
Maximum Soil Screening Levels for TPH [4] (<20 ft above GW) in mg/Kg			*100*	*100*	*1,000*	*VARIES*
Maximum Soil Screening Levels for TPH [4] (20-150ft above GW) in mg/Kg			*500*	*1,000*	*10,000*	
US EPA Regional Soil Screening Levels for Industrial Soils in mg/Kg [5]			---	---	---	*VARIES*
FORMER MOBIL - DEVORE, CA						
SB-1	5	10/6/2011	ALL ND			ALL ND
	10		ALL ND			ALL ND
	15		ALL ND			ALL ND
	20		ALL ND			ALL ND
SB-2	5	10/6/2011	ALL ND			ALL ND
	10		ALL ND			ALL ND
	15		ALL ND			ALL ND
SB-3	5	10/6/2011	ALL ND			ALL ND
	10		ALL ND			ALL ND
	15		ALL ND			ALL ND
	20		ALL ND			ALL ND
	25		ALL ND			ALL ND
SB-4	5	10/6/2011	ALL ND			ALL ND
	10		ALL ND			ALL ND
	15		ALL ND			ALL ND
SB-5	5	10/7/2011	ALL ND			ALL ND
	10		ALL ND			ALL ND
	15		ALL ND			ALL ND
	20		ALL ND			ALL ND
SB-6	5*	10/7/2011	--			--
	10		ALL ND			ALL ND
	15		ALL ND			ALL ND
	20		ALL ND			ALL ND
SB-7	5	10/7/2011	ALL ND			ALL ND
	10		ALL ND			ALL ND
	15		ALL ND			ALL ND
	20		ALL ND			ALL ND
SB-8	5	10/7/2011	ALL ND			ALL ND
	10		ALL ND			ALL ND
	15		ALL ND			ALL ND
	20		ALL ND			ALL ND
SB-9	5*	10/7/2011	--			--
	10		ALL ND			ALL ND
	15		ALL ND			ALL ND
	20		ALL ND			ALL ND

Notes:

(1) - Soil Boring identification number

(2) - Sample depth reported in feet below the ground surface

(3) - TPH by EPA Test Method 8015M and VOCs by EPA Test Method 8260B

(4) - CRWQCB Maximum Soil Screening Levels for TPH above Drinking Water Aquifers, May 1996, in mg/Kg.

(5) - United States Environmental Protection Agency (Region 9) Regional Screening Levels (RSLs; in mg/Kg) for VOCs for industrial soil (last updated May 2010).

BOLD values are concentrations detected above the laboratory method detection limit (MDL)

J - Indicates a result detected above the MDL but below the laboratory reporting limits

Grey shaded values are concentrations exceeding at least one of the respective regulatory screening levels listed for the constituent.

<10 - analyte not reported at or above stated laboratory method detection limit (MDL)

-- No agency action level established for this constituent.

*No sample recovery

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APPENDIX A
ANALYTICAL LABORATORY REPORTS AND CHAIN-OF-CUSTODY RECORDS

A & R Laboratories
Formerly Microbac Southern California
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RIVERSIDE CA, 92507
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www.arlaboratories.com office@arlaboratories.com

FDA#	2030513
LA City#	10261
ELAP#'s	2789
	2790
	2122

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CASE NARRATIVE

Authorized Signature Name / Title (print)	Ken Zheng, President
Signature / Date	Ken Zheng, President 10/12/2011 12:55:31
Laboratory Job No. (Certificate of Analysis No.)	1110-00054
Project Name / No.	AECOM-DEVORE INTERCHANGE 185802352
Dates Sampled (from/to)	10/06/11 To 10/07/11
Dates Received (from/to)	10/07/11 To 10/07/11
Dates Reported (from/to)	10/12/11 To 10/12/2011
Chains of Custody Received	Yes

Comments:

Subcontracting

Organic Analyses

No analyses sub-contracted

Sample Condition(s)

All samples intact

Positive Results (Organic Compounds)

Sample	Analyte	Result	Qual	Units	RL	Sample	Analyte	Result	Qual	Units	RL

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CERTIFICATE OF ANALYSIS

1110-00054

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 001 **SB-1-5** Date & Time Sampled: 10/06/11 @ 9:15
Sample Matrix: **Solid**

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
[VOCs by GCMS]								
Closed System P&T VOC Soil	Complete			EPA 5035	1		10/09/11	KZ
Acetone	<0.10		mg/Kg	EPA 8260B	1	0.10	10/09/11	KZ
t-Amyl Methyl Ether (TAME)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Benzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromobenzene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromochloromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromodichloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromoform	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromomethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
t-Butanol (TBA)	<0.020		mg/Kg	EPA 8260B	1	0.020	10/09/11	KZ
2-Butanone (MEK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
n-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
sec-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
tert-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Carbon Disulfide	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Carbon Tetrachloride	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chloroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Chloroform	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Chloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
4-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dibromochloromethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromoethane (EDB)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromo-3-Chloropropane	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Dibromomethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,4-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dichlorodifluoromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,1-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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CERTIFICATE OF ANALYSIS

1110-00054

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 001 **SB-1-5** Date & Time Sampled: 10/06/11 @ 9:15
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
1,2-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloroethene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
cis-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
trans-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
cis-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
trans-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Diisopropyl Ether (DiPE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Ethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Ethyl-t-Butyl Ether (EtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Hexachlorobutadiene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Hexanone	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Isopropylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
4-Isopropyltoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Methylene Chloride	<0.050		mg/Kg	EPA 8260B	1	0.050	10/09/11	KZ
4-Methyl-2-Pentanone (MIBK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Methyl-t-butyl Ether (MtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Naphthalene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
n-Propylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Styrene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,1,2-Tetrachloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2,2-Tetrachloroethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Tetrachloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Toluene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2,4-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,1,1-Trichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2-Trichloroethane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ

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1110-00054

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 001 **SB-1-5**					Date & Time Sampled:		10/06/11 @ 9:15	
Sample Matrix: **Solid**								
.....continued								
Trichloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichloropropane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichlorofluoromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Trichlorotrifluoroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,2,4-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3,5-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Vinyl Chloride	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
m,p-Xylenes	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
o-Xylene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
[VOC Surrogates]								
Dibromofluoromethane	104		%REC	EPA 8260B		70-130	10/09/11	KZ
Toluene-D8	97		%REC	EPA 8260B		70-130	10/09/11	KZ
Bromofluorobenzene	95		%REC	EPA 8260B		70-130	10/09/11	KZ
[Extractable Hydrocarbons]								
Waste Dilution	Complete			EPA 3580	1		10/08/11	KZ
C13-C22	<10		mg/Kg	EPA 8015B	1	10	10/09/11	KZ
C23-C40	<20		mg/Kg	EPA 8015B	1	20	10/09/11	KZ
[Surrogate]								
o-Terphenyl (OTP)	68		%REC	EPA 8015B		50-150	10/09/11	KZ
[TPH Gasoline (C4-C12)]								
Closed System P&T TPHg Soil	Complete			EPA 5035	1		10/09/11	KZ
C4-C12	<0.20		mg/Kg	CA LUFT	1	0.20	10/09/11	KZ
Sample: 002 **SB-1-10**					Date & Time Sampled:		10/06/11 @ 9:30	
Sample Matrix: **Solid**								
[VOCs by GCMS]								
Closed System P&T VOC Soil	Complete			EPA 5035	1		10/09/11	KZ
Acetone	<0.10		mg/Kg	EPA 8260B	1	0.10	10/09/11	KZ
t-Amyl Methyl Ether (TAME)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Benzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromobenzene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromochloromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ

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ANNE PEREZ
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REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 002 **SB-1-10** Date & Time Sampled: 10/06/11 @ 9:30
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Bromodichloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromoform	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromomethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
t-Butanol (TBA)	<0.020		mg/Kg	EPA 8260B	1	0.020	10/09/11	KZ
2-Butanone (MEK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
n-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
sec-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
tert-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Carbon Disulfide	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Carbon Tetrachloride	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chloroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Chloroform	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Chloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
4-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dibromochloromethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromoethane (EDB)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromo-3-Chloropropane	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Dibromomethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,4-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dichlorodifluoromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,1-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloroethene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
cis-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
trans-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 002 **SB-1-10** Date & Time Sampled: 10/06/11 @ 9:30
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
2,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
cis-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
trans-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Diisopropyl Ether (DiPE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Ethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Ethyl-t-Butyl Ether (EtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Hexachlorobutadiene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Hexanone	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Isopropylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
4-Isopropyltoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Methylene Chloride	<0.050		mg/Kg	EPA 8260B	1	0.050	10/09/11	KZ
4-Methyl-2-Pentanone (MIBK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Methyl-t-butyl Ether (MtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Naphthalene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
n-Propylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Styrene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,1,2-Tetrachloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2,2-Tetrachloroethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Tetrachloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Toluene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2,4-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,1,1-Trichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2-Trichloroethane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichloropropane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichlorofluoromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Trichlorotrifluoroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,2,4-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3,5-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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CERTIFICATE OF ANALYSIS

1110-00054

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 002 **SB-1-10** Sample Matrix: **Solid**					Date & Time Sampled:		10/06/11 @ 9:30	
.....continued								
Vinyl Chloride	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
m,p-Xylenes	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
o-Xylene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
[VOC Surrogates]								
Dibromofluoromethane	101		%REC	EPA 8260B		70-130	10/09/11	KZ
Toluene-D8	98		%REC	EPA 8260B		70-130	10/09/11	KZ
Bromofluorobenzene	97		%REC	EPA 8260B		70-130	10/09/11	KZ
[Extractable Hydrocarbons]								
Waste Dilution	Complete			EPA 3580	1		10/08/11	KZ
C13-C22	<10		mg/Kg	EPA 8015B	1	10	10/09/11	KZ
C23-C40	<20		mg/Kg	EPA 8015B	1	20	10/09/11	KZ
[Surrogate]								
o-Terphenyl (OTP)	70		%REC	EPA 8015B		50-150	10/09/11	KZ
[TPH Gasoline (C4-C12)]								
Closed System P&T TPHg Soil	Complete			EPA 5035	1		10/09/11	KZ
C4-C12	<0.20		mg/Kg	CA LUFT	1	0.20	10/09/11	KZ
Sample: 003 **SB-1-15** Sample Matrix: **Solid**					Date & Time Sampled:		10/06/11 @ 11:00	
Sample: 004 **SB-1-20** Sample Matrix: **Solid**					Date & Time Sampled:		10/07/11 @ 11:00	
Sample: 005 **SB-2-5** Sample Matrix: **Solid**					Date & Time Sampled:		10/06/11 @ 11:15	
[VOCs by GCMS]								
Closed System P&T VOC Soil	Complete			EPA 5035	1		10/09/11	KZ
Acetone	<0.10		mg/Kg	EPA 8260B	1	0.10	10/09/11	KZ
t-Amyl Methyl Ether (TAME)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Benzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 005 **SB-2-5** Date & Time Sampled: 10/06/11 @ 11:15
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Bromobenzene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromochloromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromodichloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromoform	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromomethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
t-Butanol (TBA)	<0.020		mg/Kg	EPA 8260B	1	0.020	10/09/11	KZ
2-Butanone (MEK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
n-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
sec-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
tert-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Carbon Disulfide	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Carbon Tetrachloride	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chloroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Chloroform	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Chloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
4-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dibromochloromethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromoethane (EDB)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromo-3-Chloropropane	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Dibromomethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,4-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dichlorodifluoromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,1-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloroethene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
cis-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
trans-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ

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ANNE PEREZ
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REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 005 **SB-2-5** Date & Time Sampled: 10/06/11 @ 11:15
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
1,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
cis-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
trans-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Diisopropyl Ether (DiPE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Ethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Ethyl-t-Butyl Ether (EtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Hexachlorobutadiene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Hexanone	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Isopropylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
4-Isopropyltoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Methylene Chloride	<0.050		mg/Kg	EPA 8260B	1	0.050	10/09/11	KZ
4-Methyl-2-Pentanone (MIBK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Methyl-t-butyl Ether (MtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Naphthalene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
n-Propylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Styrene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,1,2-Tetrachloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2,2-Tetrachloroethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Tetrachloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Toluene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2,4-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,1,1-Trichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2-Trichloroethane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichloropropane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichlorofluoromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Trichlorotrifluoroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 005 **SB-2-5**					Date & Time Sampled:		10/06/11 @ 11:15	
Sample Matrix: **Solid**								
.....continued								
1,2,4-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3,5-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Vinyl Chloride	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
m,p-Xylenes	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
o-Xylene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
[VOC Surrogates]								
Dibromofluoromethane	102		%REC	EPA 8260B		70-130	10/09/11	KZ
Toluene-D8	101		%REC	EPA 8260B		70-130	10/09/11	KZ
Bromofluorobenzene	97		%REC	EPA 8260B		70-130	10/09/11	KZ
[Extractable Hydrocarbons]								
Waste Dilution	Complete			EPA 3580	1		10/08/11	KZ
C13-C22	<10		mg/Kg	EPA 8015B	1	10	10/09/11	KZ
C23-C40	<20		mg/Kg	EPA 8015B	1	20	10/09/11	KZ
[Surrogate]								
o-Terphenyl (OTP)	76		%REC	EPA 8015B		50-150	10/09/11	KZ
[TPH Gasoline (C4-C12)]								
Closed System P&T TPHg Soil	Complete			EPA 5035	1		10/09/11	KZ
C4-C12	<0.20		mg/Kg	CA LUFT	1	0.20	10/09/11	KZ
Sample: 006 **SB-2-10**					Date & Time Sampled:		10/06/11 @ 11:20	
Sample Matrix: **Solid**								
[VOCs by GCMS]								
Closed System P&T VOC Soil	Complete			EPA 5035	1		10/09/11	KZ
Acetone	<0.10		mg/Kg	EPA 8260B	1	0.10	10/09/11	KZ
t-Amyl Methyl Ether (TAME)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Benzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromobenzene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromochloromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromodichloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromoform	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromomethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
t-Butanol (TBA)	<0.020		mg/Kg	EPA 8260B	1	0.020	10/09/11	KZ

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Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 006 **SB-2-10** Date & Time Sampled: 10/06/11 @ 11:20
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
2-Butanone (MEK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
n-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
sec-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
tert-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Carbon Disulfide	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Carbon Tetrachloride	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chloroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Chloroform	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Chloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
4-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dibromochloromethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromoethane (EDB)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromo-3-Chloropropane	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Dibromomethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,4-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dichlorodifluoromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,1-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloroethene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
cis-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
trans-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
cis-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
trans-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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CERTIFICATE OF ANALYSIS

1110-00054

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 006 **SB-2-10** Date & Time Sampled: 10/06/11 @ 11:20
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Diisopropyl Ether (DiPE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Ethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Ethyl-t-Butyl Ether (EtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Hexachlorobutadiene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Hexanone	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Isopropylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
4-Isopropyltoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Methylene Chloride	<0.050		mg/Kg	EPA 8260B	1	0.050	10/09/11	KZ
4-Methyl-2-Pentanone (MIBK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Methyl-t-butyl Ether (MtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Naphthalene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
n-Propylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Styrene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,1,2-Tetrachloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2,2-Tetrachloroethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Tetrachloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Toluene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2,4-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,1,1-Trichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2-Trichloroethane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichloropropane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichlorofluoromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Trichlorotrifluoroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,2,4-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3,5-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Vinyl Chloride	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
m,p-Xylenes	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
o-Xylene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
[VOC Surrogates]								

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FDA#	2030513
LA City#	10261
ELAP#'s	2789
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CERTIFICATE OF ANALYSIS

1110-00054

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 006 **SB-2-10** Sample Matrix: **Solid**					Date & Time Sampled:		10/06/11 @ 11:20	
.....continued								
Dibromofluoromethane	102		%REC	EPA 8260B		70-130	10/09/11	KZ
Toluene-D8	99		%REC	EPA 8260B		70-130	10/09/11	KZ
Bromofluorobenzene	97		%REC	EPA 8260B		70-130	10/09/11	KZ
[Extractable Hydrocarbons]								
Waste Dilution	Complete			EPA 3580	1		10/08/11	KZ
C13-C22	<10		mg/Kg	EPA 8015B	1	10	10/09/11	KZ
C23-C40	<20		mg/Kg	EPA 8015B	1	20	10/09/11	KZ
[Surrogate]								
o-Terphenyl (OTP)	67		%REC	EPA 8015B		50-150	10/09/11	KZ
[TPH Gasoline (C4-C12)]								
Closed System P&T TPHg Soil	Complete			EPA 5035	1		10/09/11	KZ
C4-C12	<0.20		mg/Kg	CA LUFT	1	0.20	10/09/11	KZ
Sample: 007 **SB-2-15** Sample Matrix: **Solid**					Date & Time Sampled:		10/06/11 @ 11:35	
Sample: 008 **SB-3-5** Sample Matrix: **Solid**					Date & Time Sampled:		10/06/11 @ 11:45	
[VOCs by GCMS]								
Closed System P&T VOC Soil	Complete			EPA 5035	1		10/09/11	KZ
Acetone	<0.10		mg/Kg	EPA 8260B	1	0.10	10/09/11	KZ
t-Amyl Methyl Ether (TAME)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Benzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromobenzene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromochloromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromodichloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromoform	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromomethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
t-Butanol (TBA)	<0.020		mg/Kg	EPA 8260B	1	0.020	10/09/11	KZ
2-Butanone (MEK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
n-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ

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Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 008 **SB-3-5** Date & Time Sampled: 10/06/11 @ 11:45
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
sec-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
tert-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Carbon Disulfide	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Carbon Tetrachloride	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chloroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Chloroform	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Chloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
4-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dibromochloromethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromoethane (EDB)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromo-3-Chloropropane	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Dibromomethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,4-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dichlorodifluoromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,1-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloroethene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
cis-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
trans-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
cis-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
trans-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Diisopropyl Ether (DiPE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Ethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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ANNE PEREZ
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Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 008 **SB-3-5** Date & Time Sampled: 10/06/11 @ 11:45
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Ethyl-t-Butyl Ether (EtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Hexachlorobutadiene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Hexanone	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Isopropylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
4-Isopropyltoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Methylene Chloride	<0.050		mg/Kg	EPA 8260B	1	0.050	10/09/11	KZ
4-Methyl-2-Pentanone (MIBK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Methyl-t-butyl Ether (MtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Naphthalene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
n-Propylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Styrene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,1,2-Tetrachloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2,2-Tetrachloroethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Tetrachloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Toluene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2,4-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,1,1-Trichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2-Trichloroethane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichloropropane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichlorofluoromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Trichlorotrifluoroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,2,4-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3,5-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Vinyl Chloride	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
m,p-Xylenes	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
o-Xylene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
[VOC Surrogates]								
Dibromofluoromethane	102		%REC	EPA 8260B		70-130	10/09/11	KZ
Toluene-D8	99		%REC	EPA 8260B		70-130	10/09/11	KZ

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Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 008 **SB-3-5** Sample Matrix: **Solid**					Date & Time Sampled:		10/06/11 @ 11:45	
.....continued								
Bromofluorobenzene	94		%REC	EPA 8260B		70-130	10/09/11	KZ
[Extractable Hydrocarbons]								
Waste Dilution	Complete			EPA 3580	1		10/08/11	KZ
C13-C22	<10		mg/Kg	EPA 8015B	1	10	10/09/11	KZ
C23-C40	<20		mg/Kg	EPA 8015B	1	20	10/09/11	KZ
[Surrogate]								
o-Terphenyl (OTP)	73		%REC	EPA 8015B		50-150	10/09/11	KZ
[TPH Gasoline (C4-C12)]								
Closed System P&T TPHg Soil	Complete			EPA 5035	1		10/09/11	KZ
C4-C12	<0.20		mg/Kg	CA LUFT	1	0.20	10/09/11	KZ
Sample: 009 **SB-3-10** Sample Matrix: **Solid**					Date & Time Sampled:		10/07/11 @ 10:15	
Sample: 010 **SB-3-15** Sample Matrix: **Solid**					Date & Time Sampled:		10/07/11 @ 10:20	
[VOCs by GCMS]								
Closed System P&T VOC Soil	Complete			EPA 5035	1		10/09/11	KZ
Acetone	<0.10		mg/Kg	EPA 8260B	1	0.10	10/09/11	KZ
t-Amyl Methyl Ether (TAME)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Benzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromobenzene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromochloromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromodichloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromoform	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromomethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
t-Butanol (TBA)	<0.020		mg/Kg	EPA 8260B	1	0.020	10/09/11	KZ
2-Butanone (MEK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
n-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
sec-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
tert-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ

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Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 010 **SB-3-15** Date & Time Sampled: 10/07/11 @ 10:20
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Carbon Disulfide	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Carbon Tetrachloride	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chloroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Chloroform	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Chloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
4-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dibromochloromethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromoethane (EDB)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromo-3-Chloropropane	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Dibromomethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,4-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dichlorodifluoromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,1-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloroethene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
cis-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
trans-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
cis-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
trans-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Diisopropyl Ether (DiPE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Ethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Ethyl-t-Butyl Ether (EtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Hexachlorobutadiene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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CERTIFICATE OF ANALYSIS

1110-00054

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 010 **SB-3-15** Date & Time Sampled: 10/07/11 @ 10:20
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
2-Hexanone	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Isopropylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
4-Isopropyltoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Methylene Chloride	<0.050		mg/Kg	EPA 8260B	1	0.050	10/09/11	KZ
4-Methyl-2-Pentanone (MIBK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Methyl-t-butyl Ether (MtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Naphthalene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
n-Propylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Styrene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,1,2-Tetrachloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2,2-Tetrachloroethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Tetrachloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Toluene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2,4-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,1,1-Trichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2-Trichloroethane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichloropropane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichlorofluoromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Trichlorotrifluoroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,2,4-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3,5-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Vinyl Chloride	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
m,p-Xylenes	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
o-Xylene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
[VOC Surrogates]								
Dibromofluoromethane	100		%REC	EPA 8260B		70-130	10/09/11	KZ
Toluene-D8	99		%REC	EPA 8260B		70-130	10/09/11	KZ
Bromofluorobenzene	96		%REC	EPA 8260B		70-130	10/09/11	KZ
[Extractable Hydrocarbons]								

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 010 **SB-3-15**					Date & Time Sampled:		10/07/11 @ 10:20	
Sample Matrix: **Solid**								
.....continued								
Waste Dilution	Complete			EPA 3580	1		10/08/11	KZ
C13-C22	<10		mg/Kg	EPA 8015B	1	10	10/09/11	KZ
C23-C40	<20		mg/Kg	EPA 8015B	1	20	10/09/11	KZ
[Surrogate]								
o-Terphenyl (OTP)	79		%REC	EPA 8015B		50-150	10/09/11	KZ
[TPH Gasoline (C4-C12)]								
Closed System P&T TPHg Soil	Complete			EPA 5035	1		10/09/11	KZ
C4-C12	<0.20		mg/Kg	CA LUFT	1	0.20	10/09/11	KZ
Sample: 011 **SB-3-20**					Date & Time Sampled:		10/07/11 @ 10:25	
Sample Matrix: **Solid**								
[VOCs by GCMS]								
Closed System P&T VOC Soil	Complete			EPA 5035	1		10/09/11	KZ
Acetone	<0.10		mg/Kg	EPA 8260B	1	0.10	10/09/11	KZ
t-Amyl Methyl Ether (TAME)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Benzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromobenzene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromochloromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromodichloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromoform	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromomethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
t-Butanol (TBA)	<0.020		mg/Kg	EPA 8260B	1	0.020	10/09/11	KZ
2-Butanone (MEK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
n-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
sec-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
tert-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Carbon Disulfide	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Carbon Tetrachloride	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chloroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Chloroform	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Chloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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STANTEC
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25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 011 **SB-3-20** Date & Time Sampled: 10/07/11 @ 10:25
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
2-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
4-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dibromochloromethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromoethane (EDB)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromo-3-Chloropropane	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Dibromomethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,4-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dichlorodifluoromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,1-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloroethene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
cis-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
trans-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
cis-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
trans-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Diisopropyl Ether (DiPE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Ethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Ethyl-t-Butyl Ether (EtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Hexachlorobutadiene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Hexanone	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Isopropylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
4-Isopropyltoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Methylene Chloride	<0.050		mg/Kg	EPA 8260B	1	0.050	10/09/11	KZ
4-Methyl-2-Pentanone (MIBK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Methyl-t-butyl Ether (MtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ

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ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 011 **SB-3-20** Date & Time Sampled: 10/07/11 @ 10:25
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Naphthalene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
n-Propylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Styrene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,1,2-Tetrachloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2,2-Tetrachloroethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Tetrachloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Toluene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2,4-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,1,1-Trichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2-Trichloroethane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichloropropane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichlorofluoromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Trichlorotrifluoroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,2,4-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3,5-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Vinyl Chloride	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
m,p-Xylenes	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
o-Xylene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
[VOC Surrogates]								
Dibromofluoromethane	100		%REC	EPA 8260B		70-130	10/09/11	KZ
Toluene-D8	100		%REC	EPA 8260B		70-130	10/09/11	KZ
Bromofluorobenzene	96		%REC	EPA 8260B		70-130	10/09/11	KZ
[Extractable Hydrocarbons]								
Waste Dilution	Complete			EPA 3580	1		10/08/11	KZ
C13-C22	<10		mg/Kg	EPA 8015B	1	10	10/09/11	KZ
C23-C40	<20		mg/Kg	EPA 8015B	1	20	10/09/11	KZ
[Surrogate]								
o-Terphenyl (OTP)	80		%REC	EPA 8015B		50-150	10/09/11	KZ
[TPH Gasoline (C4-C12)]								

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Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 011 **SB-3-20** Sample Matrix: **Solid**					Date & Time Sampled:		10/07/11 @ 10:25	
.....continued								
Closed System P&T TPHg Soil	Complete			EPA 5035	1		10/09/11	KZ
C4-C12	<0.20		mg/Kg	CA LUFT	1	0.20	10/09/11	KZ
Sample: 012 **SB-3-25** Sample Matrix: **Solid**					Date & Time Sampled:		10/07/11 @ 10:35	
[VOCs by GCMS]								
Closed System P&T VOC Soil	Complete			EPA 5035	1		10/09/11	KZ
Acetone	<0.10		mg/Kg	EPA 8260B	1	0.10	10/09/11	KZ
t-Amyl Methyl Ether (TAME)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Benzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromobenzene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromochloromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromodichloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromoform	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromomethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
t-Butanol (TBA)	<0.020		mg/Kg	EPA 8260B	1	0.020	10/09/11	KZ
2-Butanone (MEK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
n-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
sec-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
tert-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Carbon Disulfide	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Carbon Tetrachloride	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chloroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Chloroform	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Chloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
4-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dibromochloromethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromoethane (EDB)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromo-3-Chloropropane	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Dibromomethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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CERTIFICATE OF ANALYSIS

1110-00054

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 012 **SB-3-25** Date & Time Sampled: 10/07/11 @ 10:35
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
1,2-Dichlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,4-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dichlorodifluoromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,1-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloroethene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
cis-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
trans-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
cis-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
trans-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Diisopropyl Ether (DiPE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Ethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Ethyl-t-Butyl Ether (EtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Hexachlorobutadiene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Hexanone	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Isopropylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
4-Isopropyltoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Methylene Chloride	<0.050		mg/Kg	EPA 8260B	1	0.050	10/09/11	KZ
4-Methyl-2-Pentanone (MIBK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Methyl-t-butyl Ether (MtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Naphthalene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
n-Propylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Styrene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,1,2-Tetrachloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2,2-Tetrachloroethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Tetrachloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 012 **SB-3-25** Sample Matrix: **Solid**					Date & Time Sampled:		10/07/11 @ 10:35	
.....continued								
Toluene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2,4-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,1,1-Trichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2-Trichloroethane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichloropropane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichlorofluoromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Trichlorotrifluoroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,2,4-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3,5-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Vinyl Chloride	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
m,p-Xylenes	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
o-Xylene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
[VOC Surrogates]								
Dibromofluoromethane	95		%REC	EPA 8260B		70-130	10/09/11	KZ
Toluene-D8	99		%REC	EPA 8260B		70-130	10/09/11	KZ
Bromofluorobenzene	94		%REC	EPA 8260B		70-130	10/09/11	KZ
[Extractable Hydrocarbons]								
Waste Dilution	Complete			EPA 3580	1		10/08/11	KZ
C13-C22	<10		mg/Kg	EPA 8015B	1	10	10/09/11	KZ
C23-C40	<20		mg/Kg	EPA 8015B	1	20	10/09/11	KZ
[Surrogate]								
o-Terphenyl (OTP)	79		%REC	EPA 8015B		50-150	10/09/11	KZ
[TPH Gasoline (C4-C12)]								
Closed System P&T TPHg Soil	Complete			EPA 5035	1		10/09/11	KZ
C4-C12	<0.20		mg/Kg	CA LUFT	1	0.20	10/09/11	KZ
Sample: 013 **SB-4-5** Sample Matrix: **Solid**					Date & Time Sampled:		10/06/11 @ 12:15	
[VOCs by GCMS]								
Closed System P&T VOC Soil	Complete			EPA 5035	1		10/09/11	KZ

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STANTEC
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REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 013 **SB-4-5** Date & Time Sampled: 10/06/11 @ 12:15
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Acetone	<0.10		mg/Kg	EPA 8260B	1	0.10	10/09/11	KZ
t-Amyl Methyl Ether (TAME)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Benzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromobenzene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromochloromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromodichloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromoform	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromomethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
t-Butanol (TBA)	<0.020		mg/Kg	EPA 8260B	1	0.020	10/09/11	KZ
2-Butanone (MEK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
n-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
sec-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
tert-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Carbon Disulfide	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Carbon Tetrachloride	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chloroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Chloroform	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Chloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
4-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dibromochloromethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromoethane (EDB)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromo-3-Chloropropane	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Dibromomethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,4-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dichlorodifluoromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,1-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 013 **SB-4-5** Date & Time Sampled: 10/06/11 @ 12:15
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
1,1-Dichloroethene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
cis-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
trans-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
cis-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
trans-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Diisopropyl Ether (DiPE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Ethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Ethyl-t-Butyl Ether (EtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Hexachlorobutadiene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Hexanone	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Isopropylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
4-Isopropyltoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Methylene Chloride	<0.050		mg/Kg	EPA 8260B	1	0.050	10/09/11	KZ
4-Methyl-2-Pentanone (MIBK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Methyl-t-butyl Ether (MtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Naphthalene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
n-Propylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Styrene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,1,2-Tetrachloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2,2-Tetrachloroethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Tetrachloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Toluene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2,4-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,1,1-Trichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2-Trichloroethane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 013 **SB-4-5**					Date & Time Sampled:		10/06/11 @ 12:15	
Sample Matrix: **Solid**								
.....continued								
1,2,3-Trichloropropane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichlorofluoromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Trichlorotrifluoroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,2,4-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3,5-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Vinyl Chloride	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
m,p-Xylenes	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
o-Xylene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
[VOC Surrogates]								
Dibromofluoromethane	100		%REC	EPA 8260B		70-130	10/09/11	KZ
Toluene-D8	101		%REC	EPA 8260B		70-130	10/09/11	KZ
Bromofluorobenzene	96		%REC	EPA 8260B		70-130	10/09/11	KZ
[Extractable Hydrocarbons]								
Waste Dilution	Complete			EPA 3580	1		10/08/11	KZ
C13-C22	<10		mg/Kg	EPA 8015B	1	10	10/09/11	KZ
C23-C40	<20		mg/Kg	EPA 8015B	1	20	10/09/11	KZ
[Surrogate]								
o-Terphenyl (OTP)	64		%REC	EPA 8015B		50-150	10/09/11	KZ
[TPH Gasoline (C4-C12)]								
Closed System P&T TPHg Soil	Complete			EPA 5035	1		10/09/11	KZ
C4-C12	<0.20		mg/Kg	CA LUFT	1	0.20	10/09/11	KZ
Sample: 014 **SB-4-10**					Date & Time Sampled:		10/06/11 @ 12:25	
Sample Matrix: **Solid**								
[VOCs by GCMS]								
Closed System P&T VOC Soil	Complete			EPA 5035	1		10/09/11	KZ
Acetone	<0.10		mg/Kg	EPA 8260B	1	0.10	10/09/11	KZ
t-Amyl Methyl Ether (TAME)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Benzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromobenzene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromochloromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromodichloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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1110-00054

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 014 **SB-4-10** Date & Time Sampled: 10/06/11 @ 12:25
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Bromoform	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromomethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
t-Butanol (TBA)	<0.020		mg/Kg	EPA 8260B	1	0.020	10/09/11	KZ
2-Butanone (MEK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
n-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
sec-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
tert-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Carbon Disulfide	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Carbon Tetrachloride	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chloroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Chloroform	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Chloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
4-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dibromochloromethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromoethane (EDB)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromo-3-Chloropropane	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Dibromomethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,4-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dichlorodifluoromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,1-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloroethene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
cis-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
trans-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 014 **SB-4-10** Date & Time Sampled: 10/06/11 @ 12:25
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
1,1-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
cis-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
trans-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Diisopropyl Ether (DiPE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Ethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Ethyl-t-Butyl Ether (EtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Hexachlorobutadiene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Hexanone	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Isopropylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
4-Isopropyltoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Methylene Chloride	<0.050		mg/Kg	EPA 8260B	1	0.050	10/09/11	KZ
4-Methyl-2-Pentanone (MIBK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Methyl-t-butyl Ether (MtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Naphthalene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
n-Propylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Styrene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,1,2-Tetrachloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2,2-Tetrachloroethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Tetrachloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Toluene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2,4-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,1,1-Trichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2-Trichloroethane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichloropropane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichlorofluoromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Trichlorotrifluoroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,2,4-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3,5-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Vinyl Chloride	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ

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Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 014 **SB-4-10**					Date & Time Sampled:		10/06/11 @ 12:25	
Sample Matrix: **Solid**								
.....continued								
m,p-Xylenes	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
o-Xylene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
[VOC Surrogates]								
Dibromofluoromethane	99		%REC	EPA 8260B		70-130	10/09/11	KZ
Toluene-D8	100		%REC	EPA 8260B		70-130	10/09/11	KZ
Bromofluorobenzene	96		%REC	EPA 8260B		70-130	10/09/11	KZ
[Extractable Hydrocarbons]								
Waste Dilution	Complete			EPA 3580	1		10/08/11	KZ
C13-C22	<10		mg/Kg	EPA 8015B	1	10	10/09/11	KZ
C23-C40	<20		mg/Kg	EPA 8015B	1	20	10/09/11	KZ
[Surrogate]								
o-Terphenyl (OTP)	73		%REC	EPA 8015B		50-150	10/09/11	KZ
[TPH Gasoline (C4-C12)]								
Closed System P&T TPHg Soil	Complete			EPA 5035	1		10/09/11	KZ
C4-C12	<0.20		mg/Kg	CA LUFT	1	0.20	10/09/11	KZ
Sample: 015 **SB-4-15**					Date & Time Sampled:		10/06/11 @ 12:35	
Sample Matrix: **Solid**								
Sample: 016 **SB-5-5**					Date & Time Sampled:		10/06/11 @ 12:40	
Sample Matrix: **Solid**								
Sample: 017 **SB-5-10**					Date & Time Sampled:		10/06/11 @ 12:45	
Sample Matrix: **Solid**								
[VOCs by GCMS]								
Closed System P&T VOC Soil	Complete			EPA 5035	1		10/09/11	KZ
Acetone	<0.10		mg/Kg	EPA 8260B	1	0.10	10/10/11	KZ
t-Amyl Methyl Ether (TAME)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
Benzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
Bromobenzene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/10/11	KZ

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Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 017 **SB-5-10** Date & Time Sampled: 10/06/11 @ 12:45
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Bromochloromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/10/11	KZ
Bromodichloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
Bromoform	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/10/11	KZ
Bromomethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/10/11	KZ
t-Butanol (TBA)	<0.020		mg/Kg	EPA 8260B	1	0.020	10/10/11	KZ
2-Butanone (MEK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/10/11	KZ
n-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
sec-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
tert-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
Carbon Disulfide	<0.010		mg/Kg	EPA 8260B	1	0.010	10/10/11	KZ
Carbon Tetrachloride	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
Chlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
Chloroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/10/11	KZ
Chloroform	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
Chloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
2-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
4-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
Dibromochloromethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
1,2-Dibromoethane (EDB)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
1,2-Dibromo-3-Chloropropane	<0.010		mg/Kg	EPA 8260B	1	0.010	10/10/11	KZ
Dibromomethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
1,2-Dichlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
1,3-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
1,4-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
Dichlorodifluoromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/10/11	KZ
1,1-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
1,2-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
1,1-Dichloroethene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/10/11	KZ
cis-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
trans-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
1,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ

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Cust #	1003
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Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 017 **SB-5-10** Date & Time Sampled: 10/06/11 @ 12:45
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
1,3-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
2,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
1,1-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
cis-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
trans-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
Diisopropyl Ether (DiPE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
Ethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
Ethyl-t-Butyl Ether (EtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
Hexachlorobutadiene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
2-Hexanone	<0.010		mg/Kg	EPA 8260B	1	0.010	10/10/11	KZ
Isopropylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
4-Isopropyltoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
Methylene Chloride	<0.050		mg/Kg	EPA 8260B	1	0.050	10/10/11	KZ
4-Methyl-2-Pentanone (MIBK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/10/11	KZ
Methyl-t-butyl Ether (MtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
Naphthalene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
n-Propylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
Styrene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
1,1,1,2-Tetrachloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
1,1,2,2-Tetrachloroethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
Tetrachloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
Toluene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
1,2,3-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
1,2,4-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
1,1,1-Trichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
1,1,2-Trichloroethane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/10/11	KZ
Trichloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
1,2,3-Trichloropropane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/10/11	KZ
Trichlorofluoromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
Trichlorotrifluoroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/10/11	KZ
1,2,4-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ

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1110-00054

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 017 **SB-5-10**					Date & Time Sampled:		10/06/11 @ 12:45	
Sample Matrix: **Solid**								
.....continued								
1,3,5-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
Vinyl Chloride	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
m,p-Xylenes	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/10/11	KZ
o-Xylene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/10/11	KZ
[VOC Surrogates]								
Dibromofluoromethane	112		%REC	EPA 8260B		70-130	10/09/11	KZ
Toluene-D8	111		%REC	EPA 8260B		70-130	10/10/11	KZ
Bromofluorobenzene	115		%REC	EPA 8260B		70-130	10/09/11	KZ
[Extractable Hydrocarbons]								
Waste Dilution	Complete			EPA 3580	1		10/08/11	KZ
C13-C22	<10		mg/Kg	EPA 8015B	1	10	10/09/11	KZ
C23-C40	<20		mg/Kg	EPA 8015B	1	20	10/09/11	KZ
[Surrogate]								
o-Terphenyl (OTP)	67		%REC	EPA 8015B		50-150	10/09/11	KZ
[TPH Gasoline (C4-C12)]								
Closed System P&T TPHg Soil	Complete			EPA 5035	1		10/09/11	KZ
C4-C12	<0.20		mg/Kg	CA LUFT	1	0.20	10/10/11	KZ
Sample: 018 **SB-5-15**					Date & Time Sampled:		10/06/11 @ 12:55	
Sample Matrix: **Solid**								
Sample: 019 **SB-5-20**					Date & Time Sampled:		10/07/11 @ 9:45	
Sample Matrix: **Solid**								
Sample: 020 **SB-6-10**					Date & Time Sampled:		10/07/11 @ 8:25	
Sample Matrix: **Solid**								
[VOCs by GCMS]								
Closed System P&T VOC Soil	Complete			EPA 5035	1		10/09/11	KZ
Acetone	<0.10		mg/Kg	EPA 8260B	1	0.10	10/09/11	KZ
t-Amyl Methyl Ether (TAME)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ

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Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 020 **SB-6-10** Date & Time Sampled: 10/07/11 @ 8:25
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Benzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromobenzene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromochloromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromodichloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromoform	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromomethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
t-Butanol (TBA)	<0.020		mg/Kg	EPA 8260B	1	0.020	10/09/11	KZ
2-Butanone (MEK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
n-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
sec-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
tert-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Carbon Disulfide	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Carbon Tetrachloride	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chloroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Chloroform	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Chloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
4-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dibromochloromethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromoethane (EDB)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromo-3-Chloropropane	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Dibromomethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,4-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dichlorodifluoromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,1-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloroethene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
cis-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ

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Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 020 **SB-6-10** Date & Time Sampled: 10/07/11 @ 8:25
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
trans-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
cis-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
trans-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Diisopropyl Ether (DiPE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Ethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Ethyl-t-Butyl Ether (EtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Hexachlorobutadiene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Hexanone	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Isopropylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
4-Isopropyltoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Methylene Chloride	<0.050		mg/Kg	EPA 8260B	1	0.050	10/09/11	KZ
4-Methyl-2-Pentanone (MIBK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Methyl-t-butyl Ether (MtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Naphthalene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
n-Propylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Styrene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,1,2-Tetrachloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2,2-Tetrachloroethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Tetrachloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Toluene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2,4-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,1,1-Trichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2-Trichloroethane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichloropropane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichlorofluoromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 020 **SB-6-10** Sample Matrix: **Solid**					Date & Time Sampled:		10/07/11 @ 8:25	
.....continued								
Trichlorotrifluoroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,2,4-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3,5-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Vinyl Chloride	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
m,p-Xylenes	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
o-Xylene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
[VOC Surrogates]								
Dibromofluoromethane	106		%REC	EPA 8260B		70-130	10/09/11	KZ
Toluene-D8	101		%REC	EPA 8260B		70-130	10/09/11	KZ
Bromofluorobenzene	98		%REC	EPA 8260B		70-130	10/09/11	KZ
[Extractable Hydrocarbons]								
Waste Dilution	Complete			EPA 3580	1		10/08/11	KZ
C13-C22	<10		mg/Kg	EPA 8015B	1	10	10/09/11	KZ
C23-C40	<20		mg/Kg	EPA 8015B	1	20	10/09/11	KZ
[Surrogate]								
o-Terphenyl (OTP)	73		%REC	EPA 8015B		50-150	10/09/11	KZ
[TPH Gasoline (C4-C12)]								
Closed System P&T TPHg Soil	Complete			EPA 5035	1		10/09/11	KZ
C4-C12	<0.20		mg/Kg	CA LUFT	1	0.20	10/09/11	KZ
Sample: 021 **SB-6-15** Sample Matrix: **Solid**					Date & Time Sampled:		10/07/11 @ 8:30	
Sample: 022 **SB-6-20** Sample Matrix: **Solid**					Date & Time Sampled:		10/07/11 @ 8:35	
Sample: 023 **SB-7-5** Sample Matrix: **Solid**					Date & Time Sampled:		10/07/11 @ 9:00	
[VOCs by GCMS]								
Closed System P&T VOC Soil	Complete			EPA 5035	1		10/09/11	KZ

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Project: AECOM-DEVORE INTERCHANGE

Sample: 023 **SB-7-5** Date & Time Sampled: 10/07/11 @ 9:00
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Acetone	<0.10		mg/Kg	EPA 8260B	1	0.10	10/09/11	KZ
t-Amyl Methyl Ether (TAME)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Benzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromobenzene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromochloromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromodichloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromoform	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromomethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
t-Butanol (TBA)	<0.020		mg/Kg	EPA 8260B	1	0.020	10/09/11	KZ
2-Butanone (MEK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
n-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
sec-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
tert-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Carbon Disulfide	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Carbon Tetrachloride	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chloroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Chloroform	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Chloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
4-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dibromochloromethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromoethane (EDB)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromo-3-Chloropropane	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Dibromomethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,4-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dichlorodifluoromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,1-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 023 **SB-7-5** Date & Time Sampled: 10/07/11 @ 9:00
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
1,1-Dichloroethene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
cis-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
trans-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
cis-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
trans-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Diisopropyl Ether (DiPE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Ethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Ethyl-t-Butyl Ether (EtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Hexachlorobutadiene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Hexanone	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Isopropylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
4-Isopropyltoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Methylene Chloride	<0.050		mg/Kg	EPA 8260B	1	0.050	10/09/11	KZ
4-Methyl-2-Pentanone (MIBK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Methyl-t-butyl Ether (MtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Naphthalene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
n-Propylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Styrene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,1,2-Tetrachloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2,2-Tetrachloroethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Tetrachloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Toluene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2,4-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,1,1-Trichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2-Trichloroethane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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CERTIFICATE OF ANALYSIS

1110-00054

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 023 **SB-7-5**					Date & Time Sampled:		10/07/11 @ 9:00	
Sample Matrix: **Solid**								
.....continued								
1,2,3-Trichloropropane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichlorofluoromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Trichlorotrifluoroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,2,4-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3,5-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Vinyl Chloride	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
m,p-Xylenes	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
o-Xylene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
[VOC Surrogates]								
Dibromofluoromethane	102		%REC	EPA 8260B		70-130	10/09/11	KZ
Toluene-D8	101		%REC	EPA 8260B		70-130	10/09/11	KZ
Bromofluorobenzene	97		%REC	EPA 8260B		70-130	10/09/11	KZ
[Extractable Hydrocarbons]								
Waste Dilution	Complete			EPA 3580	1		10/08/11	KZ
C13-C22	<10		mg/Kg	EPA 8015B	1	10	10/09/11	KZ
C23-C40	<20		mg/Kg	EPA 8015B	1	20	10/09/11	KZ
[Surrogate]								
o-Terphenyl (OTP)	66		%REC	EPA 8015B		50-150	10/09/11	KZ
[TPH Gasoline (C4-C12)]								
Closed System P&T TPHg Soil	Complete			EPA 5035	1		10/09/11	KZ
C4-C12	<0.20		mg/Kg	CA LUFT	1	0.20	10/09/11	KZ
Sample: 024 **SB-7-10**					Date & Time Sampled:		10/07/11 @ 9:05	
Sample Matrix: **Solid**								
[VOCs by GCMS]								
Closed System P&T VOC Soil	Complete			EPA 5035	1		10/09/11	KZ
Acetone	<0.10		mg/Kg	EPA 8260B	1	0.10	10/09/11	KZ
t-Amyl Methyl Ether (TAME)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Benzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromobenzene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromochloromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromodichloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 024 **SB-7-10** Date & Time Sampled: 10/07/11 @ 9:05
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Bromoform	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromomethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
t-Butanol (TBA)	<0.020		mg/Kg	EPA 8260B	1	0.020	10/09/11	KZ
2-Butanone (MEK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
n-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
sec-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
tert-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Carbon Disulfide	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Carbon Tetrachloride	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chloroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Chloroform	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Chloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
4-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dibromochloromethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromoethane (EDB)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromo-3-Chloropropane	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Dibromomethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,4-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dichlorodifluoromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,1-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloroethene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
cis-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
trans-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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STANTEC
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REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 024 **SB-7-10** Date & Time Sampled: 10/07/11 @ 9:05
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
1,1-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
cis-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
trans-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Diisopropyl Ether (DiPE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Ethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Ethyl-t-Butyl Ether (EtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Hexachlorobutadiene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Hexanone	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Isopropylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
4-Isopropyltoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Methylene Chloride	<0.050		mg/Kg	EPA 8260B	1	0.050	10/09/11	KZ
4-Methyl-2-Pentanone (MIBK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Methyl-t-butyl Ether (MtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Naphthalene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
n-Propylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Styrene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,1,2-Tetrachloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2,2-Tetrachloroethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Tetrachloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Toluene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2,4-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,1,1-Trichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2-Trichloroethane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichloropropane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichlorofluoromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Trichlorotrifluoroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,2,4-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3,5-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Vinyl Chloride	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ

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Date Reported	10/12/11
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Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 024 **SB-7-10**					Date & Time Sampled:		10/07/11 @ 9:05	
Sample Matrix: **Solid**								
.....continued								
m,p-Xylenes	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
o-Xylene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
[VOC Surrogates]								
Dibromofluoromethane	102		%REC	EPA 8260B		70-130	10/09/11	KZ
Toluene-D8	101		%REC	EPA 8260B		70-130	10/09/11	KZ
Bromofluorobenzene	97		%REC	EPA 8260B		70-130	10/09/11	KZ
[Extractable Hydrocarbons]								
Waste Dilution	Complete			EPA 3580	1		10/08/11	KZ
C13-C22	<10		mg/Kg	EPA 8015B	1	10	10/09/11	KZ
C23-C40	<20		mg/Kg	EPA 8015B	1	20	10/09/11	KZ
[Surrogate]								
o-Terphenyl (OTP)	80		%REC	EPA 8015B		50-150	10/09/11	KZ
[TPH Gasoline (C4-C12)]								
Closed System P&T TPHg Soil	Complete			EPA 5035	1		10/09/11	KZ
C4-C12	<0.20		mg/Kg	CA LUFT	1	0.20	10/09/11	KZ
Sample: 025 **SB-7-15**					Date & Time Sampled:		10/07/11 @ 9:10	
Sample Matrix: **Solid**								
Sample: 026 **SB-7-20**					Date & Time Sampled:		10/07/11 @ 9:15	
Sample Matrix: **Solid**								
Sample: 027 **SB-8-5**					Date & Time Sampled:		10/07/11 @ 9:25	
Sample Matrix: **Solid**								
[VOCs by GCMS]								
Closed System P&T VOC Soil	Complete			EPA 5035	1		10/09/11	KZ
Acetone	<0.10		mg/Kg	EPA 8260B	1	0.10	10/09/11	KZ
t-Amyl Methyl Ether (TAME)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Benzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromobenzene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ

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Date Reported	10/12/11
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Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 027 **SB-8-5** Date & Time Sampled: 10/07/11 @ 9:25
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Bromochloromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromodichloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromoform	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromomethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
t-Butanol (TBA)	<0.020		mg/Kg	EPA 8260B	1	0.020	10/09/11	KZ
2-Butanone (MEK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
n-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
sec-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
tert-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Carbon Disulfide	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Carbon Tetrachloride	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chloroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Chloroform	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Chloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
4-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dibromochloromethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromoethane (EDB)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromo-3-Chloropropane	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Dibromomethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,4-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dichlorodifluoromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,1-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloroethene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
cis-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
trans-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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CERTIFICATE OF ANALYSIS

1110-00054

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 027 **SB-8-5** Date & Time Sampled: 10/07/11 @ 9:25
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
1,3-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
cis-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
trans-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Diisopropyl Ether (DiPE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Ethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Ethyl-t-Butyl Ether (EtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Hexachlorobutadiene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Hexanone	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Isopropylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
4-Isopropyltoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Methylene Chloride	<0.050		mg/Kg	EPA 8260B	1	0.050	10/09/11	KZ
4-Methyl-2-Pentanone (MIBK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Methyl-t-butyl Ether (MtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Naphthalene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
n-Propylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Styrene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,1,2-Tetrachloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2,2-Tetrachloroethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Tetrachloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Toluene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2,4-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,1,1-Trichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2-Trichloroethane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichloropropane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichlorofluoromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Trichlorotrifluoroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,2,4-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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ANNE PEREZ
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REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 027 **SB-8-5**					Date & Time Sampled:		10/07/11 @ 9:25	
Sample Matrix: **Solid**								
.....continued								
1,3,5-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Vinyl Chloride	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
m,p-Xylenes	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
o-Xylene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
[VOC Surrogates]								
Dibromofluoromethane	99		%REC	EPA 8260B		70-130	10/09/11	KZ
Toluene-D8	102		%REC	EPA 8260B		70-130	10/09/11	KZ
Bromofluorobenzene	99		%REC	EPA 8260B		70-130	10/09/11	KZ
[Extractable Hydrocarbons]								
Waste Dilution	Complete			EPA 3580	1		10/08/11	KZ
C13-C22	<10		mg/Kg	EPA 8015B	1	10	10/09/11	KZ
C23-C40	<20		mg/Kg	EPA 8015B	1	20	10/09/11	KZ
[Surrogate]								
o-Terphenyl (OTP)	82		%REC	EPA 8015B		50-150	10/09/11	KZ
[TPH Gasoline (C4-C12)]								
Closed System P&T TPHg Soil	Complete			EPA 5035	1		10/09/11	KZ
C4-C12	<0.20		mg/Kg	CA LUFT	1	0.20	10/09/11	KZ
Sample: 028 **SB-8-10**					Date & Time Sampled:		10/07/11 @ 9:30	
Sample Matrix: **Solid**								
[VOCs by GCMS]								
Closed System P&T VOC Soil	Complete			EPA 5035	1		10/09/11	KZ
Acetone	<0.10		mg/Kg	EPA 8260B	1	0.10	10/09/11	KZ
t-Amyl Methyl Ether (TAME)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Benzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromobenzene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromochloromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromodichloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromoform	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromomethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
t-Butanol (TBA)	<0.020		mg/Kg	EPA 8260B	1	0.020	10/09/11	KZ
2-Butanone (MEK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ

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STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 028 **SB-8-10** Date & Time Sampled: 10/07/11 @ 9:30
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
n-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
sec-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
tert-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Carbon Disulfide	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Carbon Tetrachloride	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chloroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Chloroform	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Chloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
4-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dibromochloromethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromoethane (EDB)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromo-3-Chloropropane	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Dibromomethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,4-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dichlorodifluoromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,1-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloroethene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
cis-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
trans-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
cis-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
trans-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Diisopropyl Ether (DiPE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ

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CERTIFICATE OF ANALYSIS

1110-00054

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 028 **SB-8-10** Date & Time Sampled: 10/07/11 @ 9:30
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Ethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Ethyl-t-Butyl Ether (EtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Hexachlorobutadiene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Hexanone	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Isopropylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
4-Isopropyltoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Methylene Chloride	<0.050		mg/Kg	EPA 8260B	1	0.050	10/09/11	KZ
4-Methyl-2-Pentanone (MIBK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Methyl-t-butyl Ether (MtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Naphthalene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
n-Propylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Styrene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,1,2-Tetrachloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2,2-Tetrachloroethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Tetrachloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Toluene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2,4-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,1,1-Trichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2-Trichloroethane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichloropropane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichlorofluoromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Trichlorotrifluoroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,2,4-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3,5-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Vinyl Chloride	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
m,p-Xylenes	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
o-Xylene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
[VOC Surrogates]								
Dibromofluoromethane	102		%REC	EPA 8260B		70-130	10/09/11	KZ

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Date Reported	10/12/11
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Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 028 **SB-8-10** Sample Matrix: **Solid**					Date & Time Sampled:		10/07/11 @ 9:30	
.....continued								
Toluene-D8	100		%REC	EPA 8260B		70-130	10/09/11	KZ
Bromofluorobenzene	97		%REC	EPA 8260B		70-130	10/09/11	KZ
[Extractable Hydrocarbons]								
Waste Dilution	Complete			EPA 3580	1		10/08/11	KZ
C13-C22	<10		mg/Kg	EPA 8015B	1	10	10/09/11	KZ
C23-C40	<20		mg/Kg	EPA 8015B	1	20	10/09/11	KZ
[Surrogate]								
o-Terphenyl (OTP)	77		%REC	EPA 8015B		50-150	10/09/11	KZ
[TPH Gasoline (C4-C12)]								
Closed System P&T TPHg Soil	Complete			EPA 5035	1		10/09/11	KZ
C4-C12	<0.20		mg/Kg	CA LUFT	1	0.20	10/09/11	KZ
Sample: 029 **SB-8-15** Sample Matrix: **Solid**					Date & Time Sampled:		10/07/11 @ 9:40	
Sample: 030 **SB-8-20** Sample Matrix: **Solid**					Date & Time Sampled:		10/07/11 @ 9:50	
Sample: 031 **SB-9-10** Sample Matrix: **Solid**					Date & Time Sampled:		10/07/11 @ 8:05	
[VOCs by GCMS]								
Closed System P&T VOC Soil	Complete			EPA 5035	1		10/09/11	KZ
Acetone	<0.10		mg/Kg	EPA 8260B	1	0.10	10/09/11	KZ
t-Amyl Methyl Ether (TAME)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Benzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromobenzene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromochloromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromodichloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Bromoform	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Bromomethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ

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FDA#	2030513
LA City#	10261
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CERTIFICATE OF ANALYSIS

1110-00054

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 031 **SB-9-10** Date & Time Sampled: 10/07/11 @ 8:05
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
t-Butanol (TBA)	<0.020		mg/Kg	EPA 8260B	1	0.020	10/09/11	KZ
2-Butanone (MEK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
n-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
sec-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
tert-Butylbenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Carbon Disulfide	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Carbon Tetrachloride	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Chloroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
Chloroform	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Chloromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
4-Chlorotoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dibromochloromethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromoethane (EDB)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dibromo-3-Chloropropane	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Dibromomethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichlorobenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,4-Dichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Dichlorodifluoromethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,1-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2-Dichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloroethene	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
cis-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
trans-1,2-Dichloroethene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2,2-Dichloropropane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
cis-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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CERTIFICATE OF ANALYSIS

1110-00054

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Sample: 031 **SB-9-10** Date & Time Sampled: 10/07/11 @ 8:05
Sample Matrix: **Solid**
.....continued

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
trans-1,3-Dichloropropene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Diisopropyl Ether (DiPE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Ethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Ethyl-t-Butyl Ether (EtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Hexachlorobutadiene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
2-Hexanone	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Isopropylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
4-Isopropyltoluene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Methylene Chloride	<0.050		mg/Kg	EPA 8260B	1	0.050	10/09/11	KZ
4-Methyl-2-Pentanone (MIBK)	<0.010		mg/Kg	EPA 8260B	1	0.010	10/09/11	KZ
Methyl-t-butyl Ether (MtBE)	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Naphthalene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
n-Propylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Styrene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,1,2-Tetrachloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2,2-Tetrachloroethane	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
Tetrachloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Toluene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,2,4-Trichlorobenzene	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
1,1,1-Trichloroethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,1,2-Trichloroethane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichloroethene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,2,3-Trichloropropane	<0.0030		mg/Kg	EPA 8260B	1	0.0030	10/09/11	KZ
Trichlorofluoromethane	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Trichlorotrifluoroethane	<0.0050		mg/Kg	EPA 8260B	1	0.0050	10/09/11	KZ
1,2,4-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
1,3,5-Trimethylbenzene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ
Vinyl Chloride	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
m,p-Xylenes	<0.0020		mg/Kg	EPA 8260B	1	0.0020	10/09/11	KZ
o-Xylene	<0.0010		mg/Kg	EPA 8260B	1	0.0010	10/09/11	KZ

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CERTIFICATE OF ANALYSIS

1110-00054

STANTEC
ANNE PEREZ
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374-4515

Date Reported	10/12/11
Date Received	10/07/11
Invoice No.	66075
Cust #	1003
Permit Number	
Customer P.O.	185802352

Project: AECOM-DEVORE INTERCHANGE

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 031 **SB-9-10** Sample Matrix: **Solid**					Date & Time Sampled:		10/07/11 @ 8:05	
.....continued								
[VOC Surrogates]								
Dibromofluoromethane	100		%REC	EPA 8260B		70-130	10/09/11	KZ
Toluene-D8	99		%REC	EPA 8260B		70-130	10/09/11	KZ
Bromofluorobenzene	96		%REC	EPA 8260B		70-130	10/09/11	KZ
[Extractable Hydrocarbons]								
Waste Dilution	Complete			EPA 3580	1		10/08/11	KZ
C13-C22	<10		mg/Kg	EPA 8015B	1	10	10/09/11	KZ
C23-C40	<20		mg/Kg	EPA 8015B	1	20	10/09/11	KZ
[Surrogate]								
o-Terphenyl (OTP)	71		%REC	EPA 8015B		50-150	10/09/11	KZ
[TPH Gasoline (C4-C12)]								
Closed System P&T TPHg Soil	Complete			EPA 5035	1		10/09/11	KZ
C4-C12	<0.20		mg/Kg	CA LUFT	1	0.20	10/09/11	KZ
Sample: 032 **SB-9-15** Sample Matrix: **Solid**					Date & Time Sampled:		10/07/11 @ 8:10	
Sample: 033 **SB-9-20** Sample Matrix: **Solid**					Date & Time Sampled:		10/07/11 @ 8:15	

Respectfully Submitted: Ken Zheng

Ken Zheng - President

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QUALIFIERS

B = Detected in the associated Method Blank at a concentration above the routine RL.
B1 = BOD dilution water is over specifications . The reported result may be biased high.
D = Surrogate recoveries are not calculated due to sample dilution.
E = Estimated value; Value exceeds calibration level of instrument.
H = Analyte was prepared and/or analyzed outside of the analytical method holding time
I = Matrix Interference.
J = Analyte concentration detected between RL and MDL.
Q = One or more quality control criteria did not meet specifications. See Comments for further explanation.
S = Customer provided specification limit exceeded.

ABBREVIATIONS

DF = Dilution Factor
RL = Reporting Limit, Adjusted by DF
MDL = Method Detection Limit, Adjusted by DF
Qual = Qualifier
Tech = Technician

As regulatory limits change frequently, A & R Laboratories advises the recipient of this report to confirm such limits with the appropriate federal, state, or local authorities before acting in reliance on the regulatory limits provided.

For any feedback concerning our services, please contact Marilu Escher, Project Manager at 951.779.0310. You may also contact Ken Zheng, President at arlab@arlaboratories.com.

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QUALITY CONTROL DATA REPORT

1110-00054

STANTEC
REDLANDS, CA 92374-4515

Date Reported	**10/12/2011**
Date Received	**10/07/2011**
Date Sampled	**10/06/2011**
Invoice No.	**66075**
Customer #	**1003**
Customer P.O.	**185802352**

Project: AECOM-DEVORE INTERCHANGE

Method # CA LUFT
QC Reference # 31897 **Date Analyzed:** 10/9/2011 **Technician:** KZ
Samples 001 002 005 006 008 010 011 012 013 014 017 020 023 024 027 028 031

Results

	LCS %REC	LCS %DUP	LCS %RPD
C4-C12	114	107	5.9

Control Ranges

LCS %REC	LCS %RPD
70 - 130	0 - 25

Method # EPA 8015B
QC Reference # 31898 **Date Analyzed:** 10/9/2011 **Technician:** KZ
Samples 001 002 005 006 008 010 011 012 013 014 017 020 023 024 027 028 031

Results

	LCS %REC	LCS %DUP	LCS %RPD	SPIKE %REC	SPIKE %DUP	SPIKE %RPD	BLKSRR%REC
C13-C22	79	80	3	78	83	7	
o-Terphenyl (OTP)							69

Control Ranges

LCS %REC	LCS %RPD	SPIKE %RPD	BLKSRR%REC
70 - 130	0 - 25	0 - 25	
			50 - 150

Method # EPA 8260B
QC Reference # 31896 **Date Analyzed:** 10/10/2011 **Technician:** KZ
Samples 001 002 005 006 008 010 011 012 013 014 017 020 023 024 027 028 031

Results

	LCS %REC	LCS %DUP	LCS %RPD	BLKSRR%REC
1,1-Dichloroethene	100	122	20.1	
Benzene	99	117	16.4	
Bromofluorobenzene				97
Chlorobenzene	101	114	12.6	
Dibromofluoromethan				102
Toluene	97	116	17.0	
Toluene-D8				97
Trichloroethene	101	116	14.3	

Control Ranges

LCS %REC	LCS %RPD	BLKSRR%REC
70 - 130	0 - 25	
70 - 130	0 - 25	
		70 - 130
70 - 130	0 - 25	
		70 - 130
70 - 130	0 - 25	
		70 - 130
70 - 130	0 - 25	

No method blank results were above reporting limit

Respectfully Submitted: Ken Zheng

Ken Zheng - President

For any feedback concerning our services, please contact Marilu Escher, Project Manager at 951.779.0310. You may also contact Ken Zheng, President at arlab@arlaboratories.com.

CHAIN OF CUSTODY FORM

Stantec

25864-F-Business Center I

1110 - 54

Page 1 of 3

Client Name/Address: Stantec, 25864-F Business Center Dr., Redlands, CA 92374	Project/PO Number: 185802352
Project Manager: Anne Perez	Phone Number: 909-335-6116
Email Address: Anne.Perez@Stantec.com Sampler: Mark Zellmer	Fax Number: 909-335-6120

	Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Sampling Time	Preservatives	VOC by EPA Method 8260B +Oxys	CAM Metals (with Total Chromium) by EPA Method 200.	TPH by 8015 M C6-C12 C12-C40 g. diesel, motor oil							Special Instructions
								Analysis Required									
1	SB-1-5	S	Acetate	1	10/6/11	915		X		X							Run lead
2	SB-1-10					930		X		X							by 6010B if
3	SB-1-15					1100											TPH detected
4	SB-1-20				10/7/11	1100											on SB-1, SB-3,
5	SB-2-5				10/6/11	1115		X		X							SB-4 and SB-5
6	SB-2-10					1120		X		X							
7	SB-2-15					1135											
8	SB-3-5				10/6/11	1145		X		X							
9	SB-3-10				10/7/11	1015		~~X~~									
10	SB-3-15					1020		X		X							
11	SB-3-20					1025		X		X							
12	SB-3-25					1035		X		X							
13	SB-4-5				10/6/11	1215		X		X							
14	SB-4-10					1225		X		X							

Relinquished By:	Date/Time:	Received By:	Date/ Time:	Turnaround	Time: (Chec
Mark Zellmer	10/7/11 1346		10/7/11 13:41	same day	
Relinquished By:	Date/Time:	Received By:	Date/Time:	24 hours	5 days
				48 hours	normal X
Relinquished By:	Date/Time:	Received in Lab By:	Date/ Time;	Sample Integrity: (Check)	
				intact X	on ice X

Note: By relinquishing samples, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

CHAIN OF CUSTODY FORM

25864-F-Business Cent

1110- 54

Stantec

Client Name/Address: Stantec 25864-F Business Center Dr. Redlands, CA 92374	Project/PO Number: 185802352
Project Manager: Email Address: Sampler:	Phone Number:909-335-6116 Fax Number:909-335-6120

	Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Sampling Time	Preservatives	VOC by EPA Method 8260B +oxys	CAM Metals (with Total Chromium) by EPA Method 200.	TPH by 8015 M C4-C12 C12-C40 3, di mo							Special Instructions
		Analysis Required															
15	SB-4-15				10/6/11	1235	Ice										
16	SB-5-5					1240											
17	SB-5-10					1245		X		X							
18	SB-5-15					1255											
19	SB-5-20				10/7/11	945											
20	SB-6-10					825		X		X							
21	SB-6-15					830		X									
22	SB-6-20					835											
23	SB-7-5					900		X		X							
24	SB-7-10					905		X		X							
25	SB-7-15					910											
26	SB-7-20					915											
27	SB-8-5					925		X		X							
28	SB-8-10					930		X		X							

Relinquished By:	Date/Time:	Received By:	Date/ Time:	Turnaround	Time: (Chec
[signature]	10/7/11 1346	[signature]	10/7/11 13:46	same day	
Relinquished By:	Date/Time:	Received By:	Date/Time:	24 hours	5 days
				48 hours	normal X
Relinquished By:	Date/Time:	Received in Lab By:	Date/ Time;	Sample Integrity: (Check)	
				intact X	on ice X

Note: By relinquishing samples, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

CHAIN OF CUSTODY FORM

Stantec

25864-F-Business Center I

1110- 54

Page 3 of 3

Client Name/Address: Stantec 25864-F Business Center Dr. Redlands, CA 92374	Project/PO Number: 185802352
Project Manager: Email Address: Sampler:	Phone Number:909-335-6116 Fax Number:909-335-6120

	Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Sampling Time	Preservatives	VOC by EPA Method 8260B +Oxys	CAM Metals (with Total Chromium) by EPA Method 200.	TPH by 8015 M C6 +C12 C12 - C40 (Gas, Diesel)							Special Instructions
29	SB-8-15	S	Acetate	1	10/7/11	940	Ice										
30	SB-8-20					950											
31	SB-9-10					805		X		X							
32	SB-9-15					810											
33	SB-9-20					815											

Relinquished By:	Date/Time:	Received By:	Date/ Time:	Turnaround	Time: (Chec
[signature]	10/7/11 1346	[signature]	10/7/11 13:46	same day	
Relinquished By:	Date/Time:	Received By:	Date/Time:	24 hours	5 days
				48 hours	normal X
Relinquished By:	Date/Time:	Received in Lab By:	Date/ Time;	Sample Integrity: (Check)	
				intact X	on ice X

By relinquishing samples, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for - due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

DRAFT

APPENDIX B
BORING LOGS

"

DRAFT

PROJECT: **PST-3**
LOCATION: **Devore, CA**
PROJECT NUMBER:

WELL / PROBEHOLE / BOREHOLE IDENTIFICATION: **SB-1**
PAGE 1 OF 1

DRILLING: STARTED: **10/6/11** COMPLETED: **10/6/11**
INSTALLATION: STARTED: COMPLETED:
DRILLING COMPANY:
DRILLING EQUIPMENT: **5400**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **Acetate Liners**

NORTHING (ft): EASTING (ft):
LAT: LONG:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **Not Encountered** WELL DEPTH (ft):
STATIC DTW (ft): **Not Measured** BOREHOLE DEPTH (ft): **16.0**
WELL CASING DIA. (in): **---** BOREHOLE DIA. (in):
LOGGED BY: CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
			Cleared to 5' bgs							
5		SM	**SILTY SAND** ; SM; 10YR 5/2 grayish brown; fine to medium-grained; moist; trace subrounded to rounded sand; 35% fines; broken rock fragments		SB-1-5' 0915			0.0	5	
10		SW-SM	**SAND WITH SILT** ; SW-SM; 10YR 4/1 dark gray; moist; well graded; roudned to subangular; 10% fines; broken rock fragments		SB-1-10' 0930			0.0	10	Hydrated Bentonite Chips
15		SM	**SILTY SAND** ; SM; 2.5Y 5/2 grayish brown; well graded; subrounded to subangular; 35% fines; broken rock fragments		SB-1-15' 1100			0.0	15	
			Borehole terminated at 16 feet.							
20									20	
25									25	

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PROJECT: **PST-3**
LOCATION: **Devore, CA**
PROJECT NUMBER:

WELL / PROBEHOLE / BOREHOLE IDENTIFICATION: **SB-2**
PAGE 1 OF 1

DRILLING: STARTED: **10/6/11** COMPLETED: **10/6/11**
INSTALLATION: STARTED: COMPLETED:
DRILLING COMPANY:
DRILLING EQUIPMENT: **5400**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **Acetate Liners**

NORTHING (ft): EASTING (ft):
LAT: LONG:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **Not Encountered** WELL DEPTH (ft):
STATIC DTW (ft): **Not Measured** BOREHOLE DEPTH (ft): **16.0**
WELL CASING DIA. (in): **---** BOREHOLE DIA. (in):
LOGGED BY: CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
			Cleared to 5' bgs							
5		SW-SM	**SAND WITH SILT** ; SW-SM; 10YR 5/1 gray; moist; well graded; rounded to subangular; 10% fines; broken rock fragments		SB-2-5' 1115				5	
10		SW-SM	**SAND WITH SILT** ; SW-SM; 10YR 4/3 brown; moist; well graded; rounded to subangular; 10% fines; broken rock fragments		SB-2-10' 1120				10	Hydrated Bentonite Chips
15		SW-SM	**SAND WITH SILT** ; SW-SM; 10YR 5/2 grayish brown; moist; well graded; rounded to subangular; 10% fines; broken rock fragments		SB-2-15' 1135				15	
			Borehole terminated at 16 feet.							
20									20	
25									25	

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PROJECT: **PST-3**
LOCATION: **Devore, CA**
PROJECT NUMBER:

WELL / PROBEHOLE / BOREHOLE IDENTIFICATION: **SB-3**
PAGE 1 OF 1

DRILLING: STARTED: **10/6/11** COMPLETED: **10/7/11**
INSTALLATION: STARTED: COMPLETED:
DRILLING COMPANY:
DRILLING EQUIPMENT: **5400**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **Acetate Liners**

NORTHING (ft): EASTING (ft):
LAT: LONG:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **Not Encountered** WELL DEPTH (ft):
STATIC DTW (ft): **Not Measured** BOREHOLE DEPTH (ft): **26.0**
WELL CASING DIA. (in): **---** BOREHOLE DIA. (in):
LOGGED BY: CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
			Cleared to 5' bgs							
5		SW-SM	**SAND WITH SILT** ; SW-SM; 10YR 5/2 grayish brown; moist; well graded; subrounded to subangular; 10% fines; rock fragments		SB-3-5' 10/6/11 1145				5	
10			Same as above		SB-3-10' 10/7/11 1015				10	Hydrated Bentonite Chips
15		SP	**SAND** ; SP; 10YR 2/2 dark brown; fine-grained; poorly graded; trace fines; (decomposed or pulverized schist?)		SB-3-15' 10/7/11 1020				15	
20		SW-SM	**SAND WITH SILT** ; SW-SM; 10YR 4/3 brown; moist; well graded; subrounded; 10% fines; broken rock fragments		SB-3-20' 10/7/11 1025				20	
25		SP	**SAND** ; SP; 10YR 2/2 dark brown; fine-grained; poorly graded; micaceous; trace fines; (decomposed or pulverized schist?)		SB-3-25' 10/7/11 1035				25	
			Borehole terminated at 26 feet.							

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PROJECT: **PST-3**
LOCATION: **Devore, CA**
PROJECT NUMBER:

WELL / PROBEHOLE / BOREHOLE IDENTIFICATION: **SB-4**
PAGE 1 OF 1

DRILLING: STARTED: **10/6/11** COMPLETED: **10/7/11**
INSTALLATION: STARTED: COMPLETED:
DRILLING COMPANY:
DRILLING EQUIPMENT: **5400**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **Acetate Liners**

NORTHING (ft): EASTING (ft):
LAT: LONG:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **Not Encountered** WELL DEPTH (ft):
STATIC DTW (ft): **Not Measured** BOREHOLE DEPTH (ft): **16.0**
WELL CASING DIA. (in): **---** BOREHOLE DIA. (in):
LOGGED BY: CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
			Cleared to 5' bgs							
5		ML	**SANDY SILT** ; ML; 10YR 4/3 brown; subangular to subrounded; 35% well graded sand; broken rock fragments		SB-4-5' 1215				5	
10			Same as above		SB-4-10' 1225				10	Hydrated Bentonite Chips
15		ML	**SANDY SILT** ; ML; 10YR 4/3 brown; subangular to subrounded; 35% poorly graded, fine to medium grained sand; broken rock fragments		SB-5-15' 1235				15	
			Borehole terminated at 16 feet.							
20									20	
25									25	

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PROJECT: **PST-3**
LOCATION: **Devore, CA**
PROJECT NUMBER:

WELL / PROBEHOLE / BOREHOLE IDENTIFICATION: **SB-5**
PAGE 1 OF 1

DRILLING: STARTED: **10/6/11** COMPLETED: **10/7/11**
INSTALLATION: STARTED: COMPLETED:
DRILLING COMPANY:
DRILLING EQUIPMENT: **5400**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **Acetate Liners**

NORTHING (ft): EASTING (ft):
LAT: LONG:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **Not Encountered** WELL DEPTH (ft):
STATIC DTW (ft): **Not Measured** BOREHOLE DEPTH (ft): **16.0**
WELL CASING DIA. (in): **---** BOREHOLE DIA. (in):
LOGGED BY: CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
			Cleared to 5' bgs							
5		SM	**SANDY SILT** ; SM; 10YR 4/3 brown; moist; 40% well graded sand; subangular to subrounded		SB-5-5' 10/6/11 1240			0.0	5	
10		SM	**SANDY SILT** ; SM; 10YR 2/1 black; moist; 40% well graded sand; subangular to subrounded; organic?		SB-5-10' 10/6/11 1245			0.0	10	Hydrated Bentonite Chips
15		SW	**SAND** ; SW; 10YR 4/3 brown; moist; well graded; subrounded to subangular; 5% fines; broken rock fragments		SB-5-15' 10/6/11 1255				15	
			Borehole terminated at 16 feet.							
20									20	
25									25	

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PROJECT: **PST-3**
LOCATION: **Devore, CA**
PROJECT NUMBER:

WELL / PROBEHOLE / BOREHOLE IDENTIFICATION: **SB-6**
PAGE 1 OF 1

DRILLING: STARTED: **10/7/11** COMPLETED: **10/7/11**
INSTALLATION: STARTED: COMPLETED:
DRILLING COMPANY:
DRILLING EQUIPMENT: **5400**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **Acetate Liners**

NORTHING (ft): EASTING (ft):
LAT: LONG:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **Not Encountered** WELL DEPTH (ft):
STATIC DTW (ft): **Not Measured** BOREHOLE DEPTH (ft): **21.0**
WELL CASING DIA. (in): **---** BOREHOLE DIA. (in):
LOGGED BY: CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
			Cleared to 5' bgs							
5			NO RECOVERY						5	
10		SM	**SILTY SAND** ; SM; 10YR 4/3 brown; moist; well graded; angular to subangular; 20% fines; broken rock fragments		SB-6-10' 0825			0.0	10	Hydrated Bentonite Chips
15		SW	**SAND** ; SW; 10YR 4/3 brown; moist; well graded; subrounded to subangular; trace fines; broken rock fragments		SB-6-15' 0830			0.0	15	
20		SM	**SILTY SAND** ; SM; 10YR 5/2 grayish brown; fine to medium-grained; moist; poorly graded; trace subangular to subrounded coarse grained; 15% fines; broken rock fragments		SB-6-20' 0835				20	
			Borehole terminated at 21 feet.							
25									25	

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PROJECT: **PST-3**
LOCATION: **Devore, CA**
PROJECT NUMBER:

WELL / PROBEHOLE / BOREHOLE IDENTIFICATION: **SB-7**
PAGE 1 OF 1

DRILLING: STARTED: **10/7/11** COMPLETED: **10/7/11**
INSTALLATION: STARTED: COMPLETED:
DRILLING COMPANY:
DRILLING EQUIPMENT: **5400**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **Acetate Liners**

NORTHING (ft): EASTING (ft):
LAT: LONG:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **Not Encountered** WELL DEPTH (ft):
STATIC DTW (ft): **Not Measured** BOREHOLE DEPTH (ft): **21.0**
WELL CASING DIA. (in): **---** BOREHOLE DIA. (in):
LOGGED BY: CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
			Cleared to 5' bgs							
5		SW-SM	**SAND WITH SILT** ; SW-SM; 10YR 4/3 brown; moist; well graded; subrounded to subangular; 15% fines; broken rock fragments		SB-7-5' 0900			1.0	5	
10		SM	**SILTY SAND** ; SM; 10YR 4/5 brown; fine to medium-grained; moist; poorly graded; 5% subrounded to subangular coarse grained; 25% fines; broken rock fragments		SB-7-10' 0905			0.3	10	Hydrated Bentonite Chips
15		SM	**SANDY SAND** ; SM; 10YR 4/3 brown; moist; well graded; subrounded to subangular; 20% fines; broken rock fragmets		SB-7-15' 0910			0.0	15	
20			Same as above but 15% fines		SB-7-20' 0915			0.0	20	
			Borehole terminated at 21 feet.							
25									25	

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PROJECT: **PST-3**
LOCATION: **Devore, CA**
PROJECT NUMBER:

WELL / PROBEHOLE / BOREHOLE IDENTIFICATION: **SB-8**
PAGE 1 OF 1

DRILLING: STARTED: **10/7/11** COMPLETED: **10/7/11**
INSTALLATION: STARTED: COMPLETED:
DRILLING COMPANY:
DRILLING EQUIPMENT: **5400**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **Acetate Liners**

NORTHING (ft): EASTING (ft):
LAT: LONG:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **Not Encountered** WELL DEPTH (ft):
STATIC DTW (ft): **Not Measured** BOREHOLE DEPTH (ft): **21.0**
WELL CASING DIA. (in): **---** BOREHOLE DIA. (in):
LOGGED BY: CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
			Cleared to 5' bgs							
5		SM	**SILTY SAND** ; SM; 10YR 4/3 brown; moist; well graded; subrounded to subangular; 30% fines; broken rock fragments; trace fine subrounded gravel		SB-5-5' 0925			0.0	5	
10		SM	**SILTY SAND** ; SM; 10YR 3/2 dark grayish brown; moist; well graded; subrounded to subangular; 10% subangular gravel; broken rock fragments		SB-8-10' 0930			0.0	10	Hydrated Bentonite Chips
15		SM	**SILTY SAND** ; SM; 10YR 4/3 brown; moist; well graded; subrounded to subangular; 30% fines; broken rock fragments; trace fine subrounded gravel		SB-8-15' 0940			0.0	15	
20		SM	**SILTY SAND** ; SM; 10YR 4/3 brown; fine to medium-grained; moist; poorly graded; 5% subangular coarse grained; 20% fines		SB-8-20' 0950			0.0	20	
			Borehole terminated at 21 feet.							
25									25	

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PROJECT: **PST-3**
LOCATION: **Devore, CA**
PROJECT NUMBER:

WELL / PROBEHOLE / BOREHOLE IDENTIFICATION: **SB-9**
PAGE 1 OF 1

DRILLING: STARTED: **10/7/11** COMPLETED: **10/7/11**
INSTALLATION: STARTED: COMPLETED:
DRILLING COMPANY:
DRILLING EQUIPMENT: **5400**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **Acetate Liners**

NORTHING (ft): EASTING (ft):
LAT: LONG:
GROUND ELEV (ft): TOC ELEV (ft):
INITIAL DTW (ft): **Not Encountered** WELL DEPTH (ft):
STATIC DTW (ft): **Not Measured** BOREHOLE DEPTH (ft): **21.0**
WELL CASING DIA. (in): **---** BOREHOLE DIA. (in):
LOGGED BY: CHECKED BY:

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Borehole Backfill
			Cleared to 5' bgs							
5			NO RECOVERY						5	
10		SM	**SILTY SAND** ; SM; 10YR 7/3 brown; moist; well graded; subangular to subrounded; 15% fines; broken rock		SB-9-10' 0805			0.0	10	Hydrated Bentonite Chips
15			Same as above but trace fines		SB-9-15' 0810			0.0	15	
20		SM	**SILTY SAND** ; SM; 10YR 4/3 brown; fine to medium-grained; moist; subangular to angular; 30% fines; broken rock fragments		SB-9-20' 0815			0.0	20	
			Borehole terminated at 21 feet.							
25									25	

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PRELIMINARY SITE INVESTIGATION (PSI) REPORT
FORMER AGRICULTURAL AREAS WITHIN HIGHWAY IMPROVEMENT ZONE
I-15/I-215 Interchange Improvements Project
San Bernardino County, California

Prepared for:
AECOM
901 Via Piemonte, 5th Floor
Ontario, California 91764

Prepared by:
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Redlands, California 92374

December 27, 2011

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FIGURES

Figure 1 Site Location Map
Figure 2 Site Plan with Boring Locations

APPENDICES

Appendix A Analytical Laboratory Reports and Chain-of-Custody Records

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1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION AND OBJECTIVES

At the request of AECOM and pursuant to the scope of work outlined in the Preliminary Site Investigations Work Plan dated October 20, 2011, Stantec Consulting Corporation (Stantec) has prepared this report to present the results, findings and conclusions of a Preliminary Site Assessment (PSI) conducted to investigate potential recognized environmental concerns (RECs) identified within the proposed construction area at various properties formerly used for agricultural purposes along sections of roadway within the I-215/I-15 Interchange project in the Devore area of San Bernardino County, California (Figure 1).

According to site design plans, the construction of Alternative 3A will require procurement of new right-of-way (ROW) and expansion of freeway ROW encroaching on existing residential easements. As part of due diligence activities under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), this PSI was conducted to evaluate potential environmental concerns in the construction zone within the construction area on the various residential properties.

The former agricultural use was identified as a REC in the following documents:

- Initial Site Assessment (ISA), prepared by LSA Associates, Inc., dated February 2010;
- Chapter 2.12.4 of the I-15/I-215 Interchange Improvements Project Initial Study/Environmental Assessment and Table 2.3-G (provided by AECOM, LSA, 2011);
- ADL and Environmental Site Assessment (ESA), prepared by Stantec, dated March 10, 2011; and the
- Alternative 3A Parcel Complexity Map (provided by AECOM)

The following sections describe the methodology, findings, and conclusions of the PSI performed to assess potential environmental concerns. Also included is a summary of field sampling activities, laboratory test results, and recommendations for soil management during construction activities.

1.2 SCOPE-OF-WORK

The scope of the pesticide survey consisted of the following general elements:

- Pre-field project assessment and Health and Safety Plan (HASP) development
- Soil sampling
- Laboratory analysis
- Data evaluation and report development

Each of these is discussed in detail in the following subsections.

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1.2.1 Pre-Field Activities

Site plans provided by AECOM were reviewed and compared to actual field conditions during the site reconnaissance. From this preliminary site evaluation and through discussions with AECOM engineers, sample locations were designated on site plans to guide field investigation activities. In addition, a site-specific HASP was developed to guide field activities.

1.2.2 Field Sampling Activities

The field methods used for this survey were consistent with those proposed in the work plan dated October 20, 2011. The proposed sampling locations at the residential properties were accessible and no deviations were necessary. Right-of-entry to each property was obtained by OPC and forwarded to Stantec. Two (2) out of the ten (10) properties originally proposed to be sampled in this investigation did not provide their approval for right-of-entry. As a result, only eight (8) properties were sampled in this investigation. Should right-of-entry be approved on the remaining two properties after finalization of this PSI report, Stantec will issue AECOM an addendum summarizing the additional analysis performed and conclusions from those two properties.

The right-of-entries were approved at various times and as a result, the sampling was scheduled to accommodate the approvals and sampling was performed on two (2) different days. Approximately 11 total borings were advanced at the following locations in the area of proposed construction. (Refer to Figure 2 for the property and sample locations.)

Properties sampled on December 12, 2011:

- Basque (APN#0349-141-22)– two borings advanced identified as HA-1 and HA-2
- Deland (APN#0349-141-31) – one boring advanced identified as HA-3
- Kukura (APN#0349-143-29) – one boring advanced identified as HA-4
- Smith (APN#0349-111-25)– one boring advanced identified as HA-5

Properties sampled on December 16, 2011:

- Schulte (APN#0349-143-17) – one boring advanced identified as HA-6
- Bridgewater (APN#0349-143-31) – one boring advanced identified as HA-7
- Town Square (APN#0349-112-11) – two borings advanced identified as HA-8 and HA-9
- Petro (APN#0349-111-14) – two borings advanced identified as HA-10 and HA-11

Two (2) samples were collected from each boring at depths of 0.5-1.0 and 1.5-2.0 feet bgs, or until refusal was achieved. At each location, soil samples were collected directly from the hand auger bailer, manually homogenized in the field, and discharged into glass jars with tight fitting caps and sealed with inert tape. All sample jars were labeled with a unique sample identification (ID) number, borehole ID, sample depth, sample date, and sample time. All samples were annotated on chain-of-custody forms and delivered to a laboratory certified by the California Department of Health Services Environmental Laboratory Accreditation Program (ELAP) for the analyses indicated herein.

Prior to sampling at each location, all soil sampling equipment was decontaminated using an Alconox scrub solution and followed by a tap water and deionized water double rinse.

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1.2.3 Laboratory Analyses

Soil samples were submitted under chain-of-custody to Test America Laboratories (TestAmerica). TestAmerica is certified by the California Environmental Laboratory Accreditation Program (ELAP) to perform the laboratory tests required in this investigation. Samples were analyzed for Organ-chlorine Pesticides (Alpha-BHC, Beta-BHC, Gamma BHC, Delta BHC, Heptachlor, Aldrin, Heptachlor Epoxide, Gamma-Chlordane, Endosulfan I, Alpha-Chlordane, 4,4'-DDE, Dieldrin, Endrin, Endosulfan II, 4,4'-DDD, Endrin Aldehyde, Endosulfan Sulfate, 4,4'-DDT, Endrin Ketone, and Methoxychlor) by EPA test method 8081A.

1.3 PREVIOUS SITE INVESTIGATIONS

Stantec is not aware of, and was not provided, any other environmental investigations associated with the recognized environmental concerns associated with potential pesticide residues in residential soils within the construction zone.

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2.0 INVESTIGATIVE RESULTS

2.1 SUBSURFACE CONDITIONS

The soils encountered during sampling were generally brown to brownish gray in color and consisted of medium-grained sands with silts, some clays and gravels. The soils were relatively dry in the soil column down to the maximum depth of approximately 2 feet bgs. No chemical odors or staining were reported in the soil samples. Groundwater was not encountered in any of the boreholes and not expected to be present in the upper 20 feet.

2.2 ANALYTICAL RESULTS

Copies of the laboratory reports and chain-of-custody forms are included in Appendix A. A total of eleven (11) borings were advanced producing a total of twenty-two (22) soil samples from the eight (8) properties with an approved right-of-entry agreement. All samples submitted were analyzed for Organ-chlorine Pesticides (Alpha-BHC, Beta-BHC, Gamma BHC, Delta BHC, Heptachlor, Aldrin, Heptachlor Epoxide, Gamma-Chlordane, Endosulfan I, Alpha-Chlordane, 4,4'-DDE, Dieldrin, Endrin, Endosulfan II, 4,4'-DDD, Endrin Aldehyde, Endosulfan Sulfate, 4,4'-DDT, Endrin Ketone, and Methoxychlor) by EPA test method 8081A.

Chemical analysis of all soil samples collected from all eight (8) properties sampled and listed in Section 1.2.2 indicated non-detectable concentrations (below laboratory reporting limits) of organo-chlorine pesticides.

2.3 DATA VALIDATION

Prior to submitting soil samples to the laboratory, the chain-of-custody documentation was reviewed for accuracy and completeness. The laboratory reports were crosschecked with the chain-of-custody forms to confirm accurate transposing of sample information. Laboratory quality assurance and quality control (QA/QC) data (method blanks, laboratory control samples and duplicates, matrix spike samples and duplicates) were also reviewed for compliance with QA/QC objectives. Based on this validation process, the quality of the data contained herein are adequate for the purposes of this study. Laboratory quality control data are attached in Appendix A.

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3.0 CONCLUSIONS AND RECOMMENDATIONS

A PSI was conducted to evaluate potential environmental concerns or conditions within the proposed construction zone of highway expansion within the right-of-way of several residential properties identified as former agriculture use locations. Chemical analysis of all soil samples collected from eight (8) properties indicated non-detectable concentrations (below laboratory reporting limits) of organo-chlorine pesticides.

Based on these results, it appears that no further actions are necessary with respect to potential environmental concerns related to residual pesticides in the construction zone on the former agricultural properties. Any soil considered for off-site re-use or disposal should be stockpiled, sampled and analyzed, at a minimum, for TPH (carbon chain), VOCs, and metals to assure that the soil is suitable for its intended re-use. It is recommended that the suitability of excess soil for potential re-use be evaluated in accordance with the Department of Toxic Substances Control “Information Advisory – Clean Imported Fill Material”, dated October 2001. The data may be considered for re-use if the 95 percent Upper Confidence Limit of the mean is less than the Environmental Protection Agency (EPA) Region 9 Regional Screening Levels (RSLs) for each analyte.

Other than the actions recommended above, no other investigation or remediation appears warranted at this time. As with any construction/grading project, undiscovered or unknown environmental conditions may be encountered during grading and development of the proposed project. If encountered, additional investigations and removal actions may be required at that time.

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4.0 CLOSURE

The conclusions and recommendations contained in this report/assessment are based upon professional opinions with regard to the subject matter. These opinions have been arrived at in accordance with currently accepted engineering standards and practices applicable to this location and are subject to the following inherent limitations:

The data and findings presented in this report are valid as of the dates when the investigations were performed. The passage of time, manifestation of latent conditions or occurrence of future events may require further exploration at the site, analysis of the data, and reevaluation of the findings, observations, and conclusions expressed in the report.

The data reported and the findings, observations, and conclusions expressed in the report are limited by the Scope of Work outlined in the Work Plan dated October 20, 2011.

Unless otherwise stated in the report, because of the limitations stated above, the findings, observations, and conclusions expressed in this report are not, and should not be, considered an opinion concerning the compliance of any past or present owner or operator of the site with any federal, state or local law or regulation.

No warranty or guarantee, whether express or implied, is made with respect to the data or the reported findings, observations, and conclusions, all of which, however, accurately reflect site conditions in existence at the time of investigation.

This report presents professional opinions and findings of a scientific and technical nature. While attempts were made to relate the data and findings to applicable environmental laws and regulations, the report shall not be construed to offer legal opinion as to the requirements of, nor compliance with, environmental laws, rules, regulations or policies of federal, state or local governmental agencies. Any use constitutes acceptance of the limits of liability. The report preparer's liability extends only to those parties contracted to complete this project and not to any other parties who may obtain the Report. Issues raised by the report should be reviewed by appropriate legal counsel.

This report is based, in part, on unverified information supplied to the report preparer by third-party sources. While efforts have been made to substantiate this third-party information, the report preparer cannot guarantee its completeness or accuracy..

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5.0 LIST OF PREPARERS

This PSI (for pesticides) report has been prepared under the direction of the following environmental professionals.

Preparers:

- Kevin K. Miskin, P.E.
  Stantec Consulting Corporation (Stantec)
  M.S., Civil Engineering, Purdue University, West Lafayette, Indiana
  PSI Investigation Report Senior Reviewer

- Anne Perez
  Stantec
  M.S., Geology, University of California, Riverside, California
  PSI Investigation Report Reviewer, Task Manager

If you have any questions or comments regarding the information enclosed herein, please contact the undersigned at your convenience.

Respectfully submitted,
Stantec Consulting Corporation

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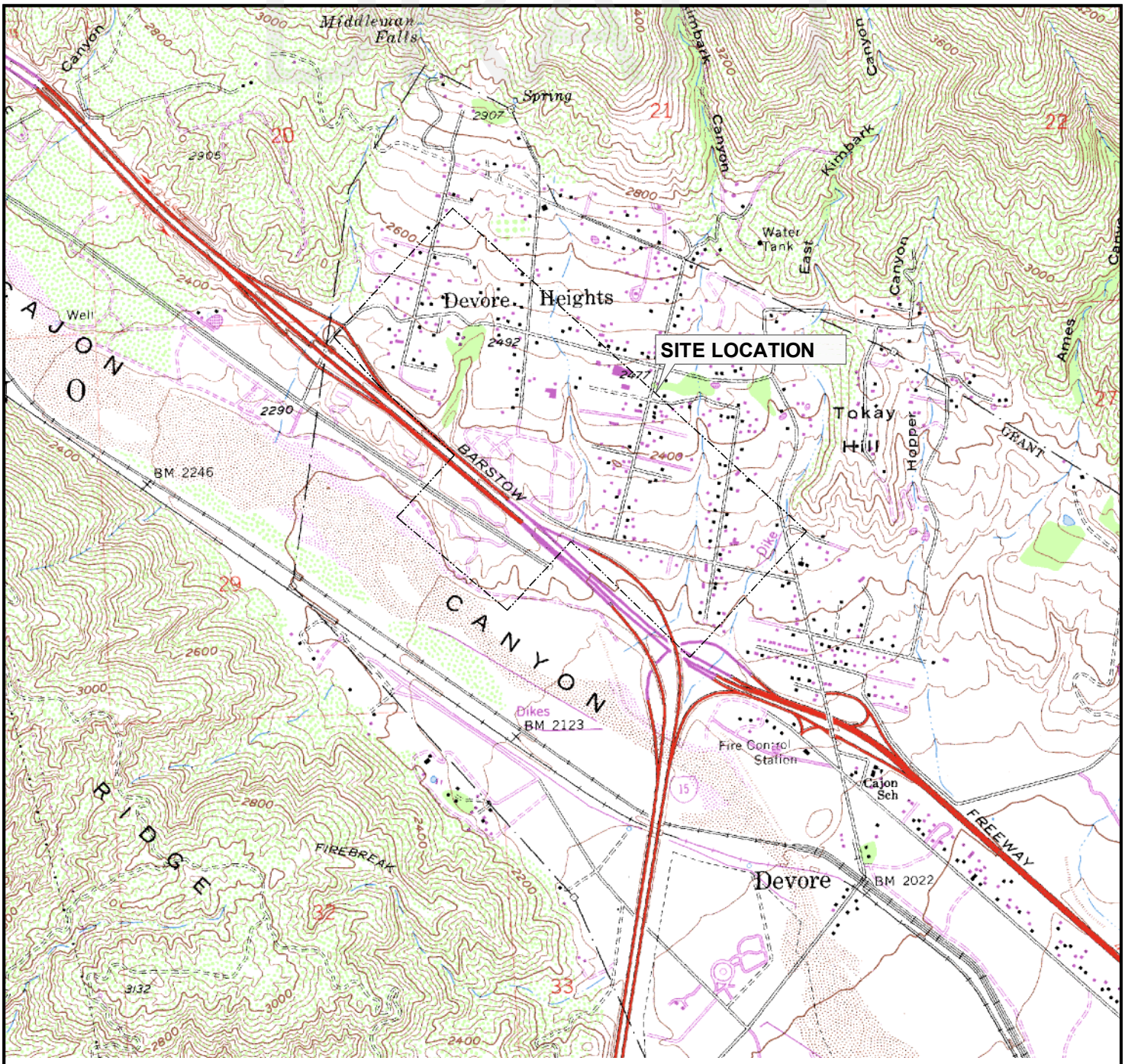
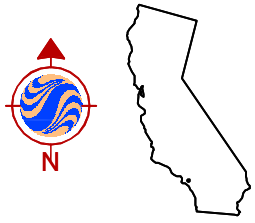
DRAFT

FIGURES

DRAFT





CALIFORNIA

1 1/2 0 1

SCALE IN MILE

1000 0 1000 2000 3000 4000 5000 6000 7000

SCALE IN FEET

REFERENCE: CA Digital Raster Graphics(http://gis.ca.gov/casil/usgs.gov/)
7.5 Minute Series, Albers NAD83, Trimmed
Block o33117e8 & o33117g8, Downloaded 5/14/10

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AECOM
I-15/I-215 DEVORE INTERCHANGE
SAN BENARDINO COUNTY
DEVORE HEIGHTS, CALIFORNIA

SITE LOCATION MAP

FIGURE: 1

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185802437	RO	AP		DEC. 2011

LEGEND

- APPROXIMATE AREA OF FORMER AGRICULTURAL PROPERTIES
- APPROXIMATE BORING LOCATIONS (BORING LOCATIONS SUBJECT TO CHANGE DUE TO PROPERTY ACCESS ISSUES)

REFERENCE:
CALTRANS DEVORE INTERCHANGE
PARCEL ACQUISITIONS MAP- ALTERNATIVE 3A, 2011.

0 500 1000

APPROXIMATE SCALE IN FEET

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I-15/I-215 DEVORE INTERCHANGE
SAN BENARDINO COUNTY
DEVORE HEIGHTS, CALIFORNIA

PESTICIDE BORING LOCATION MAP

FIGURE: 2

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
185802437	RO	AP		DEC. 2011

FILEPATH:P:\CADD\PROJECTS\CalTrans\AECOM-LANDEVORE\Devore Interchange dwg\lresendiz\Dec 23, 2011 at 14:15\Layout: F2-SP

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APPENDIX A
ANALYTICAL LABORATORY REPORTS AND CHAIN-OF-CUSTODY RECORDS

"

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

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LABORATORY REPORT

Prepared For: Stantec Consulting Corp. - Redlands
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Redlands, CA 92374
Attention: Anne Perez

Project: Devore, CA
185802352

Sampled: 12/12/11
Received: 12/13/11
Issued: 12/19/11 10:29

NELAP #01108CA California ELAP#2706 CSDLAC #10256 AZ #AZ0671 NV #CA01531

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of TestAmerica and its client. This report shall not be reproduced, except in full, without written permission from TestAmerica. The Chain of Custody, 1 page, is included and is an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

ADDITIONAL INFORMATION: This report was amended to correct project name from La Palma to Devore, CA

LABORATORY ID	CLIENT ID	MATRIX
IUL1340-01	HA-1 @ 0.5-1.0	Soil
IUL1340-02	HA-1 @ 1.5-2.0	Soil
IUL1340-03	HA-2 @ 0.5-1.0	Soil
IUL1340-04	HA-2 @ 1.5-2.0	Soil
IUL1340-05	HA-3 @ 0.5-1.0	Soil
IUL1340-06	HA-3 @ 1.5-2.0	Soil
IUL1340-07	HA-4 @ 0.5-1.0	Soil
IUL1340-08	HA-4 @ 1.5-2.0	Soil
IUL1340-09	HA-5 @ 0.5-1.0	Soil
IUL1340-10	HA-5 @ 1.5-2.0	Soil

Reviewed By:

TestAmerica Irvine

Lena Davidkova
Project Manager

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Attention: Anne Perez

Project ID: Devore, CA
185802352
Report Number: IUL1340

Sampled: 12/12/11
Received: 12/13/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1340-01 (HA-1 @ 0.5-1.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
4,4'-DDE	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
4,4'-DDT	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Aldrin	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
alpha-BHC	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
beta-BHC	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
delta-BHC	EPA 8081A	11L1791	0.010	ND	1	12/14/2011	12/14/2011	
Dieldrin	EPA 8081A	11L1791	0.0035	ND	1	12/14/2011	12/14/2011	
Endosulfan I	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endosulfan II	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endosulfan sulfate	EPA 8081A	11L1791	0.010	ND	1	12/14/2011	12/14/2011	
Endrin	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endrin aldehyde	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endrin ketone	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
gamma-BHC (Lindane)	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Heptachlor	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Heptachlor epoxide	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Methoxychlor	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Chlordane	EPA 8081A	11L1791	0.050	ND	1	12/14/2011	12/14/2011	
Toxaphene	EPA 8081A	11L1791	0.20	ND	1	12/14/2011	12/14/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*85 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*66 %*				

TestAmerica Irvine

Lena Davidkova
Project Manager

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Attention: Anne Perez

Project ID: Devore, CA
185802352
Report Number: IUL1340

Sampled: 12/12/11
Received: 12/13/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1340-02 (HA-1 @ 1.5-2.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
4,4'-DDE	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
4,4'-DDT	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Aldrin	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
alpha-BHC	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
beta-BHC	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
delta-BHC	EPA 8081A	11L1791	0.010	ND	1	12/14/2011	12/14/2011	
Dieldrin	EPA 8081A	11L1791	0.0035	ND	1	12/14/2011	12/14/2011	
Endosulfan I	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endosulfan II	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endosulfan sulfate	EPA 8081A	11L1791	0.010	ND	1	12/14/2011	12/14/2011	
Endrin	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endrin aldehyde	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endrin ketone	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
gamma-BHC (Lindane)	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Heptachlor	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Heptachlor epoxide	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Methoxychlor	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Chlordane	EPA 8081A	11L1791	0.050	ND	1	12/14/2011	12/14/2011	
Toxaphene	EPA 8081A	11L1791	0.20	ND	1	12/14/2011	12/14/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*82 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*70 %*				

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Lena Davidkova
Project Manager

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Project ID: Devore, CA
185802352
Report Number: IUL1340

Sampled: 12/12/11
Received: 12/13/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1340-03 (HA-2 @ 0.5-1.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
4,4'-DDE	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
4,4'-DDT	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Aldrin	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
alpha-BHC	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
beta-BHC	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
delta-BHC	EPA 8081A	11L1791	0.010	ND	1	12/14/2011	12/14/2011	
Dieldrin	EPA 8081A	11L1791	0.0035	ND	1	12/14/2011	12/14/2011	
Endosulfan I	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endosulfan II	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endosulfan sulfate	EPA 8081A	11L1791	0.010	ND	1	12/14/2011	12/14/2011	
Endrin	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endrin aldehyde	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endrin ketone	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
gamma-BHC (Lindane)	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Heptachlor	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Heptachlor epoxide	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Methoxychlor	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Chlordane	EPA 8081A	11L1791	0.050	ND	1	12/14/2011	12/14/2011	
Toxaphene	EPA 8081A	11L1791	0.20	ND	1	12/14/2011	12/14/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*82 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*70 %*				

TestAmerica Irvine

Lena Davidkova
Project Manager

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185802352
Report Number: IUL1340

Sampled: 12/12/11
Received: 12/13/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1340-04 (HA-2 @ 1.5-2.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
4,4'-DDE	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
4,4'-DDT	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Aldrin	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
alpha-BHC	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
beta-BHC	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
delta-BHC	EPA 8081A	11L1791	0.010	ND	1	12/14/2011	12/14/2011	
Dieldrin	EPA 8081A	11L1791	0.0035	ND	1	12/14/2011	12/14/2011	
Endosulfan I	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endosulfan II	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endosulfan sulfate	EPA 8081A	11L1791	0.010	ND	1	12/14/2011	12/14/2011	
Endrin	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endrin aldehyde	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endrin ketone	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
gamma-BHC (Lindane)	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Heptachlor	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Heptachlor epoxide	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Methoxychlor	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Chlordane	EPA 8081A	11L1791	0.050	ND	1	12/14/2011	12/14/2011	
Toxaphene	EPA 8081A	11L1791	0.20	ND	1	12/14/2011	12/14/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*84 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*62 %*				

TestAmerica Irvine

Lena Davidkova
Project Manager

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Project ID: Devore, CA
185802352
Report Number: IUL1340

Sampled: 12/12/11
Received: 12/13/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1340-05 (HA-3 @ 0.5-1.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
4,4'-DDE	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
4,4'-DDT	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Aldrin	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
alpha-BHC	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
beta-BHC	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
delta-BHC	EPA 8081A	11L1791	0.010	ND	1	12/14/2011	12/14/2011	
Dieldrin	EPA 8081A	11L1791	0.0035	ND	1	12/14/2011	12/14/2011	
Endosulfan I	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endosulfan II	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endosulfan sulfate	EPA 8081A	11L1791	0.010	ND	1	12/14/2011	12/14/2011	
Endrin	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endrin aldehyde	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endrin ketone	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
gamma-BHC (Lindane)	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Heptachlor	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Heptachlor epoxide	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Methoxychlor	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Chlordane	EPA 8081A	11L1791	0.050	ND	1	12/14/2011	12/14/2011	
Toxaphene	EPA 8081A	11L1791	0.20	ND	1	12/14/2011	12/14/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*84 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*63 %*				

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Lena Davidkova
Project Manager

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Stantec Consulting Corp. - Redlands
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Attention: Anne Perez

Project ID: Devore, CA
185802352
Report Number: IUL1340

Sampled: 12/12/11
Received: 12/13/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1340-06 (HA-3 @ 1.5-2.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
4,4'-DDE	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
4,4'-DDT	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Aldrin	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
alpha-BHC	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
beta-BHC	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
delta-BHC	EPA 8081A	11L1791	0.010	ND	1	12/14/2011	12/14/2011	
Dieldrin	EPA 8081A	11L1791	0.0035	ND	1	12/14/2011	12/14/2011	
Endosulfan I	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endosulfan II	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endosulfan sulfate	EPA 8081A	11L1791	0.010	ND	1	12/14/2011	12/14/2011	
Endrin	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endrin aldehyde	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endrin ketone	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
gamma-BHC (Lindane)	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Heptachlor	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Heptachlor epoxide	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Methoxychlor	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Chlordane	EPA 8081A	11L1791	0.050	ND	1	12/14/2011	12/14/2011	
Toxaphene	EPA 8081A	11L1791	0.20	ND	1	12/14/2011	12/14/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*87 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*70 %*				

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Report Number: IUL1340

Sampled: 12/12/11
Received: 12/13/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1340-07 (HA-4 @ 0.5-1.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	C-1
4,4'-DDE	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
4,4'-DDT	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	C-2
Aldrin	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
alpha-BHC	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
beta-BHC	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
delta-BHC	EPA 8081A	11L1791	0.010	ND	1	12/14/2011	12/14/2011	
Dieldrin	EPA 8081A	11L1791	0.0035	ND	1	12/14/2011	12/14/2011	
Endosulfan I	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endosulfan II	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endosulfan sulfate	EPA 8081A	11L1791	0.010	ND	1	12/14/2011	12/14/2011	
Endrin	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endrin aldehyde	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endrin ketone	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
gamma-BHC (Lindane)	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Heptachlor	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Heptachlor epoxide	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Methoxychlor	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	C-2
Chlordane	EPA 8081A	11L1791	0.050	ND	1	12/14/2011	12/14/2011	
Toxaphene	EPA 8081A	11L1791	0.20	ND	1	12/14/2011	12/14/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*92 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*70 %*				

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Report Number: IUL1340

Sampled: 12/12/11
Received: 12/13/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1340-08 (HA-4 @ 1.5-2.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/15/2011	C-1
4,4'-DDE	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/15/2011	
4,4'-DDT	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/15/2011	C-2
Aldrin	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/15/2011	
alpha-BHC	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/15/2011	
beta-BHC	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/15/2011	
delta-BHC	EPA 8081A	11L1791	0.010	ND	1	12/14/2011	12/15/2011	
Dieldrin	EPA 8081A	11L1791	0.0035	ND	1	12/14/2011	12/15/2011	
Endosulfan I	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/15/2011	
Endosulfan II	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/15/2011	
Endosulfan sulfate	EPA 8081A	11L1791	0.010	ND	1	12/14/2011	12/15/2011	
Endrin	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/15/2011	
Endrin aldehyde	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/15/2011	
Endrin ketone	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/15/2011	
gamma-BHC (Lindane)	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/15/2011	
Heptachlor	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/15/2011	
Heptachlor epoxide	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/15/2011	
Methoxychlor	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/15/2011	C-2
Chlordane	EPA 8081A	11L1791	0.050	ND	1	12/14/2011	12/15/2011	
Toxaphene	EPA 8081A	11L1791	0.20	ND	1	12/14/2011	12/15/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*88 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*74 %*				

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Report Number: IUL1340

Sampled: 12/12/11
Received: 12/13/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1340-09 (HA-5 @ 0.5-1.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
4,4'-DDE	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
4,4'-DDT	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Aldrin	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
alpha-BHC	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
beta-BHC	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
delta-BHC	EPA 8081A	11L1791	0.010	ND	1	12/14/2011	12/14/2011	
Dieldrin	EPA 8081A	11L1791	0.0035	ND	1	12/14/2011	12/14/2011	
Endosulfan I	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endosulfan II	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endosulfan sulfate	EPA 8081A	11L1791	0.010	ND	1	12/14/2011	12/14/2011	
Endrin	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endrin aldehyde	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endrin ketone	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
gamma-BHC (Lindane)	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Heptachlor	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Heptachlor epoxide	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Methoxychlor	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Chlordane	EPA 8081A	11L1791	0.050	ND	1	12/14/2011	12/14/2011	
Toxaphene	EPA 8081A	11L1791	0.20	ND	1	12/14/2011	12/14/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*82 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*53 %*				

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Report Number: IUL1340

Sampled: 12/12/11
Received: 12/13/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1340-10 (HA-5 @ 1.5-2.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
4,4'-DDE	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
4,4'-DDT	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Aldrin	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
alpha-BHC	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
beta-BHC	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
delta-BHC	EPA 8081A	11L1791	0.010	ND	1	12/14/2011	12/14/2011	
Dieldrin	EPA 8081A	11L1791	0.0035	ND	1	12/14/2011	12/14/2011	
Endosulfan I	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endosulfan II	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endosulfan sulfate	EPA 8081A	11L1791	0.010	ND	1	12/14/2011	12/14/2011	
Endrin	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endrin aldehyde	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Endrin ketone	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
gamma-BHC (Lindane)	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Heptachlor	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Heptachlor epoxide	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Methoxychlor	EPA 8081A	11L1791	0.0050	ND	1	12/14/2011	12/14/2011	
Chlordane	EPA 8081A	11L1791	0.050	ND	1	12/14/2011	12/14/2011	
Toxaphene	EPA 8081A	11L1791	0.20	ND	1	12/14/2011	12/14/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*86 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*83 %*				

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Report Number: IUL1340

Sampled: 12/12/11
Received: 12/13/11

METHOD BLANK/QC DATA

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 11L1791 Extracted: 12/14/11										
Blank Analyzed: 12/14/2011 (11L1791-BLK1)										
4,4'-DDD	ND	0.0050	mg/kg							
4,4'-DDE	ND	0.0050	mg/kg							
4,4'-DDT	ND	0.0050	mg/kg							
Aldrin	ND	0.0050	mg/kg							
alpha-BHC	ND	0.0050	mg/kg							
beta-BHC	ND	0.0050	mg/kg							
delta-BHC	ND	0.010	mg/kg							
Dieldrin	ND	0.0035	mg/kg							
Endosulfan I	ND	0.0050	mg/kg							
Endosulfan II	ND	0.0050	mg/kg							
Endosulfan sulfate	ND	0.010	mg/kg							
Endrin	ND	0.0050	mg/kg							
Endrin aldehyde	ND	0.0050	mg/kg							
Endrin ketone	ND	0.0050	mg/kg							
gamma-BHC (Lindane)	ND	0.0050	mg/kg							
Heptachlor	ND	0.0050	mg/kg							
Heptachlor epoxide	ND	0.0050	mg/kg							
Methoxychlor	ND	0.0050	mg/kg							
Chlordane	ND	0.050	mg/kg							
Toxaphene	ND	0.20	mg/kg							
Surrogate: Decachlorobiphenyl	*0.0292*		*mg/kg*	*0.0333*		*88*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.0255*		*mg/kg*	*0.0333*		*77*	*35-115*			
LCS Analyzed: 12/14/2011 (11L1791-BS1)										
4,4'-DDD	0.0338	0.0050	mg/kg	0.0333		102	60-120			
4,4'-DDE	0.0329	0.0050	mg/kg	0.0333		99	60-120			
4,4'-DDT	0.0344	0.0050	mg/kg	0.0333		103	65-120			
Aldrin	0.0300	0.0050	mg/kg	0.0333		90	50-115			
alpha-BHC	0.0294	0.0050	mg/kg	0.0333		88	60-115			
beta-BHC	0.0309	0.0050	mg/kg	0.0333		93	60-115			
delta-BHC	0.0332	0.010	mg/kg	0.0333		100	60-115			
Dieldrin	0.0331	0.0035	mg/kg	0.0333		99	65-115			
Endosulfan I	0.0316	0.0050	mg/kg	0.0333		95	40-120			
Endosulfan II	0.0305	0.0050	mg/kg	0.0333		91	55-120			
Endosulfan sulfate	0.0342	0.010	mg/kg	0.0333		103	65-115			
Endrin	0.0355	0.0050	mg/kg	0.0333		106	55-120			

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METHOD BLANK/QC DATA

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 11L1791 Extracted: 12/14/11										
LCS Analyzed: 12/14/2011 (11L1791-BS1)										
Endrin aldehyde	0.0297	0.0050	mg/kg	0.0333		89	55-115			
Endrin ketone	0.0348	0.0050	mg/kg	0.0333		105	65-115			
gamma-BHC (Lindane)	0.0313	0.0050	mg/kg	0.0333		94	55-115			
Heptachlor	0.0308	0.0050	mg/kg	0.0333		92	55-115			
Heptachlor epoxide	0.0316	0.0050	mg/kg	0.0333		95	55-115			
Methoxychlor	0.0347	0.0050	mg/kg	0.0333		104	65-120			
Surrogate: Decachlorobiphenyl	*0.0311*		*mg/kg*	*0.0333*		*93*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.0272*		*mg/kg*	*0.0333*		*81*	*35-115*			
Matrix Spike Analyzed: 12/14/2011 (11L1791-MS1)					**Source: IUL1340-10**					
4,4'-DDD	0.0313	0.0050	mg/kg	0.0333	ND	94	40-130			
4,4'-DDE	0.0309	0.0050	mg/kg	0.0333	ND	93	35-130			
4,4'-DDT	0.0321	0.0050	mg/kg	0.0333	ND	96	35-130			
Aldrin	0.0283	0.0050	mg/kg	0.0333	ND	85	40-115			
alpha-BHC	0.0262	0.0050	mg/kg	0.0333	ND	78	40-115			
beta-BHC	0.0296	0.0050	mg/kg	0.0333	ND	89	40-120			
delta-BHC	0.0312	0.010	mg/kg	0.0333	ND	94	45-120			
Dieldrin	0.0307	0.0035	mg/kg	0.0333	ND	92	40-125			
Endosulfan I	0.0296	0.0050	mg/kg	0.0333	ND	89	40-120			
Endosulfan II	0.0300	0.0050	mg/kg	0.0333	ND	90	40-125			
Endosulfan sulfate	0.0305	0.010	mg/kg	0.0333	ND	91	45-120			
Endrin	0.0331	0.0050	mg/kg	0.0333	ND	99	45-125			
Endrin aldehyde	0.0269	0.0050	mg/kg	0.0333	ND	81	30-120			
Endrin ketone	0.0316	0.0050	mg/kg	0.0333	ND	95	40-120			
gamma-BHC (Lindane)	0.0289	0.0050	mg/kg	0.0333	ND	87	40-120			
Heptachlor	0.0285	0.0050	mg/kg	0.0333	ND	86	40-115			
Heptachlor epoxide	0.0298	0.0050	mg/kg	0.0333	ND	90	45-115			
Methoxychlor	0.0314	0.0050	mg/kg	0.0333	ND	94	40-135			
Surrogate: Decachlorobiphenyl	*0.0289*		*mg/kg*	*0.0333*		*87*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.0217*		*mg/kg*	*0.0333*		*65*	*35-115*			

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25864-F Business Center Drive
Redlands, CA 92374
Attention: Anne Perez

Project ID: Devore, CA
185802352
Report Number: IUL1340

Sampled: 12/12/11
Received: 12/13/11

METHOD BLANK/QC DATA

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 11L1791 Extracted: 12/14/11										
Matrix Spike Dup Analyzed: 12/14/2011 (11L1791-MSD1)					**Source: IUL1340-10**					
4,4'-DDD	0.0298	0.0050	mg/kg	0.0333	ND	89	40-130	5	30	
4,4'-DDE	0.0306	0.0050	mg/kg	0.0333	ND	92	35-130	1	30	
4,4'-DDT	0.0318	0.0050	mg/kg	0.0333	ND	95	35-130	1	30	
Aldrin	0.0272	0.0050	mg/kg	0.0333	ND	82	40-115	4	30	
alpha-BHC	0.0249	0.0050	mg/kg	0.0333	ND	75	40-115	5	30	
beta-BHC	0.0293	0.0050	mg/kg	0.0333	ND	88	40-120	0.8	30	
delta-BHC	0.0310	0.010	mg/kg	0.0333	ND	93	45-120	0.7	30	
Dieldrin	0.0303	0.0035	mg/kg	0.0333	ND	91	40-125	1	30	
Endosulfan I	0.0292	0.0050	mg/kg	0.0333	ND	88	40-120	1	30	
Endosulfan II	0.0290	0.0050	mg/kg	0.0333	ND	87	40-125	3	30	
Endosulfan sulfate	0.0308	0.010	mg/kg	0.0333	ND	92	45-120	1	30	
Endrin	0.0319	0.0050	mg/kg	0.0333	ND	96	45-125	4	30	
Endrin aldehyde	0.0262	0.0050	mg/kg	0.0333	ND	79	30-120	2	30	
Endrin ketone	0.0318	0.0050	mg/kg	0.0333	ND	95	40-120	0.5	30	
gamma-BHC (Lindane)	0.0277	0.0050	mg/kg	0.0333	ND	83	40-120	4	30	
Heptachlor	0.0271	0.0050	mg/kg	0.0333	ND	81	40-115	5	30	
Heptachlor epoxide	0.0294	0.0050	mg/kg	0.0333	ND	88	45-115	2	30	
Methoxychlor	0.0314	0.0050	mg/kg	0.0333	ND	94	40-135	0.07	30	
Surrogate: Decachlorobiphenyl	*0.0287*		*mg/kg*	*0.0333*		*86*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.0206*		*mg/kg*	*0.0333*		*62*	*35-115*			

TestAmerica Irvine

Lena Davidkova
Project Manager

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Stantec Consulting Corp. - Redlands
25864-F Business Center Drive
Redlands, CA 92374
Attention: Anne Perez

Project ID: Devore, CA
185802352
Report Number: IUL1340

Sampled: 12/12/11
Received: 12/13/11

GC CALIBRATION CHECK CRITERIA

Per Method 8000B of SW-846, the percent recovery of the calibration checks for GC analyses must be within ± 15% from the true value for each individual compound or the average % recovery of all compounds in the calibration check solution must be within ± 15% recovery. Per Method 8000B, the end user is to be notified if the latter situation occurs.

The % recovery for the following individual compounds fell outside the ± 15% criteria, however the average % recovery of all compounds in the calibration check solution was within ± 15%, thus meeting the overall calibration check criteria.

Compound	Footnote	Calibration Check % Recovery	Lab Number	Batch
4,4'-DDD	1		IUL1340-07	11L1791
4,4'-DDD	1		IUL1340-08	11L1791
4,4'-DDT	2		IUL1340-07	11L1791
4,4'-DDT	2		IUL1340-08	11L1791
Methoxychlor	2		IUL1340-07	11L1791
Methoxychlor	2		IUL1340-08	11L1791

Footnotes:

1 The calibration demonstrated a high bias for this compound. Samples were flagged to indicate a possible high bias in the result for this compound.

2 The calibration demonstrated a low bias for this compound. Samples were flagged to indicate a possible low bias in the result for this compound.

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Project Manager

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Attention: Anne Perez

Project ID: Devore, CA
185802352
Report Number: IUL1340

Sampled: 12/12/11
Received: 12/13/11

DATA QUALIFIERS AND DEFINITIONS

C-1 Calibration Verification recovery was above the method control limit for this analyte, however the average % difference for all analytes met method criteria.

C-2 Calibration Verification recovery was below the method control limit for this analyte, however the average % difference for all analytes met method criteria.

ND Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.

RPD Relative Percent Difference

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Attention: Anne Perez

Project ID: Devore, CA
185802352
Report Number: IUL1340

Sampled: 12/12/11
Received: 12/13/11

Certification Summary

TestAmerica Irvine

Method	Matrix	Nelac	California
EPA 8081A	Soil	X	

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for TestAmerica may be obtained by contacting the laboratory or visiting our website at www.testamericainc.com

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Lena Davidkova
Project Manager

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IVL 1340

TestAmerica

CHAIN OF CUSTODY FORM

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1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (909) 370-1046
9830 South 51st St., Suite 13-120, Phoenix, AZ 85044 (480) 785-0043 FAX (484) 785-0851

THE LEADER IN ENVIRONMENTAL TESTING

TAL-0013(1007)

Page 1 of 1

Client Name/Address:
Stantec
25864-F BUSINESS CENTER DRIVE
REDLANDS, CA 92374

Project/PO Number:
185802352

Project Manager: Anne Perez

Phone Number: 909 255 8202

Sampler: Dion Monge / Anne Perez

Fax Number: 909 335-6120

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Sampling Time	Preservatives	Analysis Required: PESTICIDES EPA TEST METHOD 8082	Special Instructions
HA-1 @ 0.5-1.0	Soil	GLASS JAR	1	12/12/2011	0940	ice	X	
HA-1 @ 1.5-2.0					0950		X	
HA-2 @ 0.5-1.0					1000		X	
HA-2 @ 1.5-2.0					1005		X	
HA-3 @ 0.5-1.0					1020		X	
HA-3 @ 1.5-2.0					1035		X	TN 12/13/11
HA-4 @ 0.5-1.0					1100		X	1847
HA-4 @ 1.5-2.0					1110		X	
HA-5 @ 0.5-1.0					1125		X	
HA-5 @ 1.5-2.0					1135		X	

Relinquished By:	Date/Time: 12/12/11 1702	Received By:	Date/ Time: 12/13/11 8:00
Relinquished By:	Date/Time: 12/13/11 16:10	Received By:	Date/Time: 12/13/11 16:10
Relinquished By:	Date/Time: 12/13/X 1732	Received in Lab By:	Date/ Time: 12/13/11 17:32

Turnaround Time: (Check)
same day
24 hours X
48 hours
5 days
normal

Sample Integrity: (Check)
intact X
on ice ✓

4.6°C

Note: By relinquishing samples to Test America, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

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LABORATORY REPORT

Prepared For: Stantec Consulting Corp. - Redlands
25864-F Business Center Drive
Redlands, CA 92374
Attention: Anne Perez

Project: Devore, CA
185802352

Sampled: 12/16/11
Received: 12/16/11
Issued: 12/21/11 08:08

NELAP #01108CA California ELAP#2706 CSDLAC #10256 AZ #AZ0671 NV #CA01531

The results listed within this Laboratory Report pertain only to the samples tested in the laboratory. The analyses contained in this report were performed in accordance with the applicable certifications as noted. All soil samples are reported on a wet weight basis unless otherwise noted in the report. This Laboratory Report is confidential and is intended for the sole use of TestAmerica and its client. This report shall not be reproduced, except in full, without written permission from TestAmerica. The Chain of Custody, 1 page, is included and is an integral part of this report.
This entire report was reviewed and approved for release.

SAMPLE CROSS REFERENCE

LABORATORY ID	CLIENT ID	MATRIX
IUL1960-01	HA-6-1.0	Soil
IUL1960-02	HA-6-2.0	Soil
IUL1960-03	HA-7-1.0	Soil
IUL1960-04	HA-7-2.0	Soil
IUL1960-05	HA-8-1.0	Soil
IUL1960-06	HA-8-2.0	Soil
IUL1960-07	HA-9-1.0	Soil
IUL1960-08	HA-9-2.0	Soil
IUL1960-09	HA-10-1.0	Soil
IUL1960-10	HA-10-2.0	Soil
IUL1960-11	HA-11-1.0	Soil
IUL1960-12	HA-11-2.0	Soil

Reviewed By:

TestAmerica Irvine

Lena Davidkova
Project Manager

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DRAFT

Stantec Consulting Corp. - Redlands
25864-F Business Center Drive
Redlands, CA 92374
Attention: Anne Perez

Project ID: Devore, CA
185802352
Report Number: IUL1960

Sampled: 12/16/11
Received: 12/16/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1960-01 (HA-6-1.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDE	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDT	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	C-2
Aldrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
alpha-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
beta-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
delta-BHC	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Dieldrin	EPA 8081A	11L2538	0.0035	ND	1	12/19/2011	12/20/2011	
Endosulfan I	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan II	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan sulfate	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Endrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin aldehyde	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin ketone	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
gamma-BHC (Lindane)	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor epoxide	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Methoxychlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	C-2
Chlordane	EPA 8081A	11L2538	0.050	ND	1	12/19/2011	12/20/2011	
Toxaphene	EPA 8081A	11L2538	0.20	ND	1	12/19/2011	12/20/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*76 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*67 %*				

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Lena Davidkova
Project Manager

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Attention: Anne Perez

Project ID: Devore, CA 185802352
Report Number: IUL1960

Sampled: 12/16/11
Received: 12/16/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1960-02 (HA-6-2.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDE	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDT	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	C-2
Aldrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
alpha-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
beta-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
delta-BHC	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Dieldrin	EPA 8081A	11L2538	0.0035	ND	1	12/19/2011	12/20/2011	
Endosulfan I	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan II	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan sulfate	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Endrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin aldehyde	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin ketone	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
gamma-BHC (Lindane)	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor epoxide	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Methoxychlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	C-2
Chlordane	EPA 8081A	11L2538	0.050	ND	1	12/19/2011	12/20/2011	
Toxaphene	EPA 8081A	11L2538	0.20	ND	1	12/19/2011	12/20/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*75 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*70 %*				

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Lena Davidkova
Project Manager

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Stantec Consulting Corp. - Redlands
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Redlands, CA 92374
Attention: Anne Perez

Project ID: Devore, CA
185802352
Report Number: IUL1960

Sampled: 12/16/11
Received: 12/16/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1960-03 (HA-7-1.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	C-1
4,4'-DDE	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDT	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	C-2
Aldrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
alpha-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
beta-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
delta-BHC	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Dieldrin	EPA 8081A	11L2538	0.0035	ND	1	12/19/2011	12/20/2011	
Endosulfan I	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan II	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan sulfate	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Endrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin aldehyde	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin ketone	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
gamma-BHC (Lindane)	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor epoxide	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Methoxychlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	C-2
Chlordane	EPA 8081A	11L2538	0.050	ND	1	12/19/2011	12/20/2011	
Toxaphene	EPA 8081A	11L2538	0.20	ND	1	12/19/2011	12/20/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*75 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*67 %*				

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Lena Davidkova
Project Manager

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Attention: Anne Perez

Project ID: Devore, CA
185802352
Report Number: IUL1960

Sampled: 12/16/11
Received: 12/16/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1960-04 (HA-7-2.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDE	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDT	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	C-2
Aldrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
alpha-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
beta-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
delta-BHC	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Dieldrin	EPA 8081A	11L2538	0.0035	ND	1	12/19/2011	12/20/2011	
Endosulfan I	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan II	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan sulfate	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Endrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin aldehyde	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin ketone	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
gamma-BHC (Lindane)	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor epoxide	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Methoxychlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	C-2
Chlordane	EPA 8081A	11L2538	0.050	ND	1	12/19/2011	12/20/2011	
Toxaphene	EPA 8081A	11L2538	0.20	ND	1	12/19/2011	12/20/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*79 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*74 %*				

TestAmerica Irvine

Lena Davidkova
Project Manager

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Redlands, CA 92374
Attention: Anne Perez

Project ID: Devore, CA
185802352
Report Number: IUL1960

Sampled: 12/16/11
Received: 12/16/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1960-05 (HA-8-1.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDE	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDT	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	C-2
Aldrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
alpha-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
beta-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
delta-BHC	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Dieldrin	EPA 8081A	11L2538	0.0035	ND	1	12/19/2011	12/20/2011	
Endosulfan I	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan II	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan sulfate	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Endrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin aldehyde	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin ketone	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
gamma-BHC (Lindane)	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor epoxide	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Methoxychlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	C-2
Chlordane	EPA 8081A	11L2538	0.050	ND	1	12/19/2011	12/20/2011	
Toxaphene	EPA 8081A	11L2538	0.20	ND	1	12/19/2011	12/20/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*66 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*58 %*				

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Project Manager

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Stantec Consulting Corp. - Redlands
25864-F Business Center Drive
Redlands, CA 92374
Attention: Anne Perez

Project ID: Devore, CA
185802352
Report Number: IUL1960

Sampled: 12/16/11
Received: 12/16/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1960-06 (HA-8-2.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDE	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDT	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Aldrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
alpha-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
beta-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
delta-BHC	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Dieldrin	EPA 8081A	11L2538	0.0035	ND	1	12/19/2011	12/20/2011	
Endosulfan I	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan II	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan sulfate	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Endrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin aldehyde	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin ketone	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
gamma-BHC (Lindane)	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor epoxide	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Methoxychlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Chlordane	EPA 8081A	11L2538	0.050	ND	1	12/19/2011	12/20/2011	
Toxaphene	EPA 8081A	11L2538	0.20	ND	1	12/19/2011	12/20/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*73 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*70 %*				

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Project ID: Devore, CA 185802352
Report Number: IUL1960

Sampled: 12/16/11
Received: 12/16/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1960-07 (HA-9-1.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDE	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDT	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Aldrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
alpha-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
beta-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
delta-BHC	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Dieldrin	EPA 8081A	11L2538	0.0035	ND	1	12/19/2011	12/20/2011	
Endosulfan I	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan II	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan sulfate	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Endrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin aldehyde	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin ketone	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
gamma-BHC (Lindane)	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor epoxide	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Methoxychlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Chlordane	EPA 8081A	11L2538	0.050	ND	1	12/19/2011	12/20/2011	
Toxaphene	EPA 8081A	11L2538	0.20	ND	1	12/19/2011	12/20/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*77 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*73 %*				

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Project ID: Devore, CA
185802352
Report Number: IUL1960

Sampled: 12/16/11
Received: 12/16/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1960-08 (HA-9-2.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDE	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDT	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Aldrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
alpha-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
beta-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
delta-BHC	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Dieldrin	EPA 8081A	11L2538	0.0035	ND	1	12/19/2011	12/20/2011	
Endosulfan I	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan II	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan sulfate	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Endrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin aldehyde	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin ketone	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
gamma-BHC (Lindane)	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor epoxide	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Methoxychlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Chlordane	EPA 8081A	11L2538	0.050	ND	1	12/19/2011	12/20/2011	
Toxaphene	EPA 8081A	11L2538	0.20	ND	1	12/19/2011	12/20/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*74 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*74 %*				

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Project ID: Devore, CA
185802352
Report Number: IUL1960

Sampled: 12/16/11
Received: 12/16/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1960-09 (HA-10-1.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDE	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDT	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	C-2
Aldrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
alpha-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
beta-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
delta-BHC	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Dieldrin	EPA 8081A	11L2538	0.0035	ND	1	12/19/2011	12/20/2011	
Endosulfan I	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan II	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan sulfate	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Endrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin aldehyde	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin ketone	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
gamma-BHC (Lindane)	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor epoxide	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Methoxychlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	C-2
Chlordane	EPA 8081A	11L2538	0.050	ND	1	12/19/2011	12/20/2011	
Toxaphene	EPA 8081A	11L2538	0.20	ND	1	12/19/2011	12/20/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*74 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*66 %*				

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185802352
Report Number: IUL1960

Sampled: 12/16/11
Received: 12/16/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1960-10 (HA-10-2.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDE	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDT	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	C-2
Aldrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
alpha-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
beta-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
delta-BHC	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Dieldrin	EPA 8081A	11L2538	0.0035	ND	1	12/19/2011	12/20/2011	
Endosulfan I	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan II	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan sulfate	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Endrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin aldehyde	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin ketone	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
gamma-BHC (Lindane)	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor epoxide	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Methoxychlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	C-2
Chlordane	EPA 8081A	11L2538	0.050	ND	1	12/19/2011	12/20/2011	
Toxaphene	EPA 8081A	11L2538	0.20	ND	1	12/19/2011	12/20/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*74 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*72 %*				

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185802352
Report Number: IUL1960

Sampled: 12/16/11
Received: 12/16/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1960-11 (HA-11-1.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDE	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDT	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	C-2
Aldrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
alpha-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
beta-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
delta-BHC	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Dieldrin	EPA 8081A	11L2538	0.0035	ND	1	12/19/2011	12/20/2011	
Endosulfan I	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan II	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan sulfate	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Endrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin aldehyde	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin ketone	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
gamma-BHC (Lindane)	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor epoxide	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Methoxychlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	C-2
Chlordane	EPA 8081A	11L2538	0.050	ND	1	12/19/2011	12/20/2011	
Toxaphene	EPA 8081A	11L2538	0.20	ND	1	12/19/2011	12/20/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*70 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*69 %*				

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Report Number: IUL1960

Sampled: 12/16/11
Received: 12/16/11

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Method	Batch	Reporting Limit	Sample Result	Dilution Factor	Date Extracted	Date Analyzed	Data Qualifiers
Sample ID: IUL1960-12 (HA-11-2.0 - Soil)								
Reporting Units: mg/kg								
4,4'-DDD	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDE	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
4,4'-DDT	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	C-2
Aldrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
alpha-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
beta-BHC	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
delta-BHC	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Dieldrin	EPA 8081A	11L2538	0.0035	ND	1	12/19/2011	12/20/2011	
Endosulfan I	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan II	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endosulfan sulfate	EPA 8081A	11L2538	0.010	ND	1	12/19/2011	12/20/2011	
Endrin	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin aldehyde	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Endrin ketone	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
gamma-BHC (Lindane)	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Heptachlor epoxide	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	
Methoxychlor	EPA 8081A	11L2538	0.0050	ND	1	12/19/2011	12/20/2011	C-2
Chlordane	EPA 8081A	11L2538	0.050	ND	1	12/19/2011	12/20/2011	
Toxaphene	EPA 8081A	11L2538	0.20	ND	1	12/19/2011	12/20/2011	
Surrogate: Decachlorobiphenyl (45-120%)				*76 %*				
Surrogate: Tetrachloro-m-xylene (35-115%)				*78 %*				

TestAmerica Irvine

Lena Davidkova
Project Manager

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17461 Derian Avenue. Suite 100, Irvine, CA 92614 (949) 261-1022 Fax:(949) 260-3297

Stantec Consulting Corp. - Redlands
25864-F Business Center Drive
Redlands, CA 92374
Attention: Anne Perez

Project ID: Devore, CA 185802352
Report Number: IUL1960

Sampled: 12/16/11
Received: 12/16/11

METHOD BLANK/QC DATA

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 11L2538 Extracted: 12/19/11										
Blank Analyzed: 12/20/2011 (11L2538-BLK1)										
4,4'-DDD	ND	0.0050	mg/kg							
4,4'-DDE	ND	0.0050	mg/kg							
4,4'-DDT	ND	0.0050	mg/kg							
Aldrin	ND	0.0050	mg/kg							
alpha-BHC	ND	0.0050	mg/kg							
beta-BHC	ND	0.0050	mg/kg							
delta-BHC	ND	0.010	mg/kg							
Dieldrin	ND	0.0035	mg/kg							
Endosulfan I	ND	0.0050	mg/kg							
Endosulfan II	ND	0.0050	mg/kg							
Endosulfan sulfate	ND	0.010	mg/kg							
Endrin	ND	0.0050	mg/kg							
Endrin aldehyde	ND	0.0050	mg/kg							
Endrin ketone	ND	0.0050	mg/kg							
gamma-BHC (Lindane)	ND	0.0050	mg/kg							
Heptachlor	ND	0.0050	mg/kg							
Heptachlor epoxide	ND	0.0050	mg/kg							
Methoxychlor	ND	0.0050	mg/kg							
Chlordane	ND	0.050	mg/kg							
Toxaphene	ND	0.20	mg/kg							
Surrogate: Decachlorobiphenyl	*0.0276*		*mg/kg*	*0.0333*		*83*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.0249*		*mg/kg*	*0.0333*		*75*	*35-115*			
LCS Analyzed: 12/20/2011 (11L2538-BS1)										
4,4'-DDD	0.0298	0.0050	mg/kg	0.0333		89	60-120			
4,4'-DDE	0.0299	0.0050	mg/kg	0.0333		90	60-120			
4,4'-DDT	0.0306	0.0050	mg/kg	0.0333		92	65-120			
Aldrin	0.0302	0.0050	mg/kg	0.0333		91	50-115			
alpha-BHC	0.0290	0.0050	mg/kg	0.0333		87	60-115			
beta-BHC	0.0292	0.0050	mg/kg	0.0333		88	60-115			
delta-BHC	0.0325	0.010	mg/kg	0.0333		97	60-115			
Dieldrin	0.0301	0.0035	mg/kg	0.0333		90	65-115			
Endosulfan I	0.0294	0.0050	mg/kg	0.0333		88	40-120			
Endosulfan II	0.0295	0.0050	mg/kg	0.0333		88	55-120			
Endosulfan sulfate	0.0299	0.010	mg/kg	0.0333		90	65-115			
Endrin	0.0324	0.0050	mg/kg	0.0333		97	55-120			

TestAmerica Irvine

Lena Davidkova
Project Manager

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DRAFT

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Redlands, CA 92374
Attention: Anne Perez

Project ID: Devore, CA 185802352
Report Number: IUL1960

Sampled: 12/16/11
Received: 12/16/11

METHOD BLANK/QC DATA

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 11L2538 Extracted: 12/19/11										
LCS Analyzed: 12/20/2011 (11L2538-BS1)										
Endrin aldehyde	0.0269	0.0050	mg/kg	0.0333		81	55-115			
Endrin ketone	0.0316	0.0050	mg/kg	0.0333		95	65-115			
gamma-BHC (Lindane)	0.0304	0.0050	mg/kg	0.0333		91	55-115			
Heptachlor	0.0312	0.0050	mg/kg	0.0333		94	55-115			
Heptachlor epoxide	0.0299	0.0050	mg/kg	0.0333		90	55-115			
Methoxychlor	0.0304	0.0050	mg/kg	0.0333		91	65-120			
Surrogate: Decachlorobiphenyl	*0.0279*		*mg/kg*	*0.0333*		*84*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.0264*		*mg/kg*	*0.0333*		*79*	*35-115*			
Matrix Spike Analyzed: 12/20/2011 (11L2538-MS1)					**Source: IUL1960-01**					
4,4'-DDD	0.0286	0.015	mg/kg	0.0333	ND	86	40-130			
4,4'-DDE	0.0289	0.015	mg/kg	0.0333	ND	87	35-130			
4,4'-DDT	0.0286	0.015	mg/kg	0.0333	ND	86	35-130			
Aldrin	0.0287	0.015	mg/kg	0.0333	ND	86	40-115			
alpha-BHC	0.0279	0.015	mg/kg	0.0333	ND	84	40-115			
beta-BHC	0.0283	0.015	mg/kg	0.0333	0.00170	80	40-120			
delta-BHC	0.0289	0.030	mg/kg	0.0333	ND	87	45-120			
Dieldrin	0.0287	0.010	mg/kg	0.0333	ND	86	40-125			
Endosulfan I	0.0277	0.015	mg/kg	0.0333	ND	83	40-120			
Endosulfan II	0.0267	0.015	mg/kg	0.0333	ND	80	40-125			
Endosulfan sulfate	0.0270	0.030	mg/kg	0.0333	ND	81	45-120			
Endrin	0.0309	0.015	mg/kg	0.0333	0.00305	84	45-125			
Endrin aldehyde	0.0217	0.015	mg/kg	0.0333	ND	65	30-120			
Endrin ketone	0.0276	0.015	mg/kg	0.0333	ND	83	40-120			
gamma-BHC (Lindane)	0.0286	0.015	mg/kg	0.0333	ND	86	40-120			
Heptachlor	0.0293	0.015	mg/kg	0.0333	ND	88	40-115			
Heptachlor epoxide	0.0280	0.015	mg/kg	0.0333	ND	84	45-115			
Methoxychlor	0.0281	0.015	mg/kg	0.0333	ND	84	40-135			
Surrogate: Decachlorobiphenyl	*0.0252*		*mg/kg*	*0.0333*		*76*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.0234*		*mg/kg*	*0.0333*		*70*	*35-115*			

TestAmerica Irvine

Lena Davidkova
Project Manager

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DRAFT

Stantec Consulting Corp. - Redlands
25864-F Business Center Drive
Redlands, CA 92374
Attention: Anne Perez

Project ID: Devore, CA
185802352
Report Number: IUL1960

Sampled: 12/16/11
Received: 12/16/11

METHOD BLANK/QC DATA

ORGANOCHLORINE PESTICIDES (EPA 3546/8081A)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Data Qualifiers
Batch: 11L2538 Extracted: 12/19/11										
Matrix Spike Dup Analyzed: 12/20/2011 (11L2538-MSD1)					**Source: IUL1960-01**					
4,4'-DDD	0.0266	0.015	mg/kg	0.0333	ND	80	40-130	7	30	
4,4'-DDE	0.0290	0.015	mg/kg	0.0333	ND	87	35-130	0.6	30	
4,4'-DDT	0.0284	0.015	mg/kg	0.0333	ND	85	35-130	0.7	30	
Aldrin	0.0287	0.015	mg/kg	0.0333	ND	86	40-115	0.1	30	
alpha-BHC	0.0281	0.015	mg/kg	0.0333	ND	84	40-115	0.9	30	
beta-BHC	0.0273	0.015	mg/kg	0.0333	0.00170	77	40-120	4	30	
delta-BHC	0.0289	0.030	mg/kg	0.0333	ND	87	45-120	0.2	30	
Dieldrin	0.0288	0.010	mg/kg	0.0333	ND	86	40-125	0.5	30	
Endosulfan I	0.0278	0.015	mg/kg	0.0333	ND	83	40-120	0.5	30	
Endosulfan II	0.0268	0.015	mg/kg	0.0333	ND	80	40-125	0.1	30	
Endosulfan sulfate	0.0271	0.030	mg/kg	0.0333	ND	81	45-120	0.5	30	
Endrin	0.0287	0.015	mg/kg	0.0333	0.00305	77	45-125	7	30	
Endrin aldehyde	0.0209	0.015	mg/kg	0.0333	ND	63	30-120	3	30	
Endrin ketone	0.0278	0.015	mg/kg	0.0333	ND	83	40-120	0.7	30	
gamma-BHC (Lindane)	0.0285	0.015	mg/kg	0.0333	ND	85	40-120	0.5	30	
Heptachlor	0.0294	0.015	mg/kg	0.0333	ND	88	40-115	0.4	30	
Heptachlor epoxide	0.0282	0.015	mg/kg	0.0333	ND	84	45-115	0.6	30	
Methoxychlor	0.0279	0.015	mg/kg	0.0333	ND	84	40-135	0.7	30	
Surrogate: Decachlorobiphenyl	*0.0258*		*mg/kg*	*0.0333*		*77*	*45-120*			
Surrogate: Tetrachloro-m-xylene	*0.0234*		*mg/kg*	*0.0333*		*70*	*35-115*			

TestAmerica Irvine

Lena Davidkova
Project Manager

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Stantec Consulting Corp. - Redlands
25864-F Business Center Drive
Redlands, CA 92374
Attention: Anne Perez

Project ID: Devore, CA
185802352
Report Number: IUL1960

Sampled: 12/16/11
Received: 12/16/11

GC CALIBRATION CHECK CRITERIA

Per Method 8000B of SW-846, the percent recovery of the calibration checks for GC analyses must be within ± 15% from the true value for each individual compound or the average % recovery of all compounds in the calibration check solution must be within ± 15% recovery. Per Method 8000B, the end user is to be notified if the latter situation occurs.

The % recovery for the following individual compounds fell outside the ± 15% criteria, however the average % recovery of all compounds in the calibration check solution was within ± 15%, thus meeting the overall calibration check criteria.

Compound	Footnote	Calibration Check % Recovery	Lab Number	Batch
4,4'-DDD	1		IUL1960-03	11L2538
4,4'-DDT	2		IUL1960-01	11L2538
4,4'-DDT	2		IUL1960-02	11L2538
4,4'-DDT	2		IUL1960-03	11L2538
4,4'-DDT	2		IUL1960-04	11L2538
4,4'-DDT	2		IUL1960-05	11L2538
4,4'-DDT	2		IUL1960-09	11L2538
4,4'-DDT	2		IUL1960-10	11L2538
4,4'-DDT	2		IUL1960-11	11L2538
4,4'-DDT	2		IUL1960-12	11L2538
Methoxychlor	2		IUL1960-01	11L2538
Methoxychlor	2		IUL1960-02	11L2538
Methoxychlor	2		IUL1960-03	11L2538
Methoxychlor	2		IUL1960-04	11L2538
Methoxychlor	2		IUL1960-05	11L2538
Methoxychlor	2		IUL1960-09	11L2538
Methoxychlor	2		IUL1960-10	11L2538
Methoxychlor	2		IUL1960-11	11L2538
Methoxychlor	2		IUL1960-12	11L2538

Footnotes:

1 The calibration demonstrated a high bias for this compound. Samples were flagged to indicate a possible high bias in the result for this compound.

2 The calibration demonstrated a low bias for this compound. Samples were flagged to indicate a possible low bias in the result for this compound.

TestAmerica Irvine

Lena Davidkova
Project Manager

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Stantec Consulting Corp. - Redlands
25864-F Business Center Drive
Redlands, CA 92374
Attention: Anne Perez

Project ID: Devore, CA
185802352
Report Number: IUL1960

Sampled: 12/16/11
Received: 12/16/11

DATA QUALIFIERS AND DEFINITIONS

C-1 Calibration Verification recovery was above the method control limit for this analyte, however the average % difference for all analytes met method criteria.

C-2 Calibration Verification recovery was below the method control limit for this analyte, however the average % difference for all analytes met method criteria.

ND Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.

RPD Relative Percent Difference

TestAmerica Irvine

Lena Davidkova
Project Manager

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Stantec Consulting Corp. - Redlands
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Redlands, CA 92374
Attention: Anne Perez

Project ID: Devore, CA 185802352
Report Number: IUL1960

Sampled: 12/16/11
Received: 12/16/11

Certification Summary

TestAmerica Irvine

Method	Matrix	Nelac	California
EPA 8081A	Soil	X	

Nevada and NELAP provide analyte specific accreditations. Analyte specific information for TestAmerica may be obtained by contacting the laboratory or visiting our website at www.testamericainc.com

TestAmerica Irvine

Lena Davidkova
Project Manager

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THE LEADER IN ENVIRONMENTAL TESTING

CHAIN OF CUSTODY FORM

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1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (909) 370-1046
9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851
2520 E. Sunset Rd. #3, Las Vegas, NV 89120 (702) 798-3620 FAX (702) 798-3621

TAL-0013(1007)

IUL1960

Client Name/Address: STANTEC
25864-F Business Center Dr
Redlands, CA 92374

Project/PO Number: 185802352

Project Manager: Anne Perez

Phone Number: 909-335-6116

Sampler: Kenny Toro

Fax Number: 909-335-6120

Sample Description	Sample Matrix	Container Type	# of Cont.	Sampling Date	Sampling Time	Preservatives	Pesticides									Special Instructions
HA-6-1.0	Soil	Glass Jar	1	12/16/11	0830	ICE	X									
HA-6-2.0			1		0838		X									
HA-7-1.0			1		0900		X									
HA-7-2.0			1		0907		X									
HA-8-1.0			1		0920		X									
HA-8-2.0			1		0927		X									
HA-9-1.0			1		0935		X									TN 12/16/11 2005
HA-9-2.0			1		0950		X									
HA-10-1.0			1		1014		X									
HA-10-2.0			1		1026		X									
HA-11-1.0			1		1035		X									
HA-11-2.0			1		1040		X									

Relinquished By:	Date/Time:	Received By:	Date/Time:
Kenny Toro	12/16/11 @ 1620		12/16/11 16:20
	12/16/11 17:10		12/16/11 1700
Vini Padilla	12/16/11 1900		12/16/11 1900

Turnaround Time: (Check)
same day ____ 72 hours ____
24 hours ____ 5 days ____
48 hours ____ normal ____

Sample Integrity: (Check)
intact X on ice X

3.3°C

Note: By relinquishing samples to TestAmerica, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

"Montes, Mario"
<Mario.Montes@aecom.com
>
03/28/2012 03:55 PM

To "'Raghuram_Radhakrishnan@dot.ca.gov'" <Raghuram_Radhakrishnan@dot.ca.gov>, "jesus_paez@dot.ca.gov" <jesus_paez@dot.ca.gov>
cc "Patrick.Hally@dot.ca.gov" <Patrick.Hally@dot.ca.gov>, "Bui, Hiep" <Hiep.Bui@aecom.com>, "dsaylor@sanbag.ca.gov" <dsaylor@sanbag.ca.gov>, "
bcc
Subject Devore: Remaining PSI's draft update

History: This message has been forwarded.

Here is a summary of the findings, Stantec is still preparing the formal reports.

Mario A. Montes, P.E.
Vice President, AECOM Transportation
Mobile: (714) 336-5191

From: Perez, Anne [mailto:Anne.Perez@stantec.com]
Sent: Wednesday, March 28, 2012 3:12 PM
To: Montes, Mario
Subject: Remaining PSI's draft update

Draft update regarding the following sites:

```
#1. One Agricultural pesticide PSI.
#2. One former gas station PSI.
#3. One Technical Memo on the backhoe investigation of the anomaly at the
former Mobil site (Caltrans Property).
```

#1: The Sigman property was the final remaining property to test soils for residual pesticides. One boring was advanced at the Site and two samples were collected for analysis of pesticides. Both samples collected from the Sigman property reported NON-DETECT concentrations. No further investigation is recommended into pesticides at this Site.

#2: The Morschauser property was a former gas station site. Caltrans only intends to acquire the portion of this property adjacent to Devore Road – this was not a full take and as a result we were instructed to advance three (3) borings parallel to Devore Road. Samples were collected at 5 foot intervals to a total depth of 20 feet bgs in all borings. Soil was screened initially with a PID to evaluate those that would be further analyzed at the lab. There were no reported detections with the PID, as a result, the typical construction zone sample, the five (5) foot sample, from each boring was submitted for analysis of VOCs and TPH. All soil samples submitted for analysis reported NON-DETECT concentrations of VOCs and TPH. If stained soils or odors are detected during construction activities Stantec recommends work is stopped immediately and samples should be collected for further analysis.

#3: The area of the geoprobe refusal during the phase II investigation (reported previously) occurred in the area of the geophysical anomaly mapped out on the former Mobil Site. As a result, this area was further investigated using a backhoe to pothole the Site to better evaluate if there is a tank remaining in the subsurface both causing the anomaly and the drilling refusal. After digging two trenches across the anomaly, the area within the limits of the geophysical anomaly appeared to be an area with a higher concentration of boulders (up to 15 inches in diameter) and cobbles as compared to the immediate surroundings. There were also sporadic pieces of metal, brick and concrete chunks found in the trenches. There were NO tanks uncovered, NO odors detected, and NO vapor readings picked up with the PID within the area investigated. This area of the anomaly may have been an area previously excavated at the site and then filled in with surrounding materials (whatever was nearby). As a result, the geophysical survey reported the subsurface differently than the native materials found across the rest of the Site

thereby showing it as an anomaly in comparison. In addition, and as requested by Pat Hally (Caltrans) during his visit to the Site during the trenching, Stantec also found that a pipe exposed at the surface was debris – it was approximately 15 feet long with 95% of its length buried. Once exposed, the pipe was found NOT to be connected to anything, it was buried debris. When excavating the Site during construction activities additional debris may be encountered and should be properly disposed.

Addendums and reports with figures illustrating the sampling locations for the above referenced sites will be completed this week for review. The laboratory data for site #1 and #2 referenced above is attached to this emailed draft update.

Anne Perez
Geologic Associate
Stantec
25864 - F Business Center Drive
Redlands CA 92374
Ph: (909) 335-6116x8202
Ph: (909) 255-8202 (direct)
Anne.Perez@stantec.com
stantec.com

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Please consider the environment before printing this email.

EXHIBIT 6-A

Sample Utility Agreement

UTILITY AGREEMENT

DISTRICT	COUNTY	ROUTE	POST MILE	EA
08	San Bernardino	Devore	08-SBd-I-15, PM 14.0/R 16.4 08-SBd-I-215, PM 16.0/17.8	EA 08-0K 710K

FEDERAL AID NUMBER	OWNER'S FILE NUMBER
---	---

FEDERAL PARTICIPATION

On the project ☒ YES ☐ NO On the Utilities ☐ YES ☐ NO

UTILITY AGREEMENT NO. ___ DATE _____

The San Bernardino Association of Governments "SANBAG" and Caltrans proposes improvements of I-15 / I-215 interchange project in the community of Devore, County of San Bernardino. These improvements include the addition of one northbound lane and one southbound lane on Interstate 15 between Interstate 215 and Glen Helen Parkway, where the current freeway is three lanes in each direction. The addition of the new lanes would provide a continuous set of four lanes in each direction between State Route 60 and US Highway 395. This would allow motorists to travel through the interchange without having to change lanes or lose lanes in the process.

The proposed improvements to Interstate 15 would allow this freeway to be the primary movement for traffic, with I-215 traffic merging and diverging from the right-hand side of the freeway. Truck bypass lanes also are being considered to help improve traffic flow along this major freight movement route. These improvements would reduce traffic delays, improve the flow of goods through the region and enhance the reliability of goods headed to and from freight facilities in the San Bernardino Valley and the Victor Valley.

And

"UTILITY OWNER'S NAME"

hereinafter called "OWNER," owns and maintains facility pole #_____ within the limits of SANBAG's project which requires relocation of said pole at the intersection of _____..

It is hereby mutually agreed that:

I. WORK TO BE DONE

In accordance with Notice to Owner No. ____ dated _____, OWNER shall relocate power pole #_____ and associated equipment. All work shall be performed substantially in accordance with OWNER's Plan consisting of 1 sheet, a copy of which is attached.

Deviations from the OWNER's plan described above initiated by either the SANBAG or the OWNER, shall be agreed upon by both parties hereto under a Revised Notice to Owner. Such Revised Notices to Owner, approved by the SANBAG and agreed to/acknowledged by the OWNER, will constitute an approved revision of the OWNER's plan described above and are hereby made a part hereof. No work under said deviation shall commence prior to written execution by the OWNER of the Revised Notice to Owner. Changes in the scope of the work will require an amendment to this Agreement in addition to the revised Notice to Owner.

II. LIABILITY FOR WORK

The existing facilities are lawfully maintained in their present location within SCE's 10' easement and qualify for relocation at 100% SANBAG expense under Freeway Master Agreement dated November 2004.

III PERFORMANCE OF WORK

OWNER agrees to perform the herein described work with its own forces or to cause the herein described work to be performed by the OWNER'S contractor, employed by written contract on a continuing basis to perform work of this type, and to provide and furnish all necessary labor, materials, tools, and equipment required therefore, and to prosecute said work diligently to completion.

IV. PAYMENT FOR WORK

SANBAG shall pay its share of the actual and necessary cost of the herein described work within 45 days after receipt of five (5) copies of OWNER's itemized bill, signed by a responsible official of OWNER's organization and prepared on OWNER'S letterhead, compiled on the basis of the actual and necessary cost and expenses incurred and charged or allocated to said work in accordance with the uniform system of account prescribed by OWNER by the California Public Utilities Commission, Federal Energy Regulatory Commission or Federal Communications Commission, whichever is applicable.

It is understood and agreed that SANBAG will not pay for any betterment or increase in capacity of OWNER's facilities in the new location and that OWNER shall give credit to SANBAG for the accrued depreciation or "used life" of the replaced facilities and for the salvage value of any material or parts salvaged and retained or sold by OWNER.

Not more frequently than once a month, but at least quarterly, OWNER will prepare and submit progress bills for costs incurred not to exceed OWNER's recorded costs as of the billing date less estimated credits applicable to completed work. Payment of progress bills not to exceed the amount specified below may be made under the terms of this Agreement. Payment of progress bills which exceed the amount of this Agreement may be made after receipt and approval by SANBAG of documentation supporting the cost increase and after an Amendment to this Agreement has been executed by the parties to this Agreement.

The OWNER shall submit a final bill to SANBAG within 360 days after the completion of the work described in Section I above. If SANBAG has not received a final bill within 360 days

after notification of completion of OWNER's work described in Section I of this Agreement, and SANBAG has delivered to OWNER fully executed Director's Deeds, Consents to Common Use or Joint Use Agreements as required for OWNER's facilities, SANBAG will provide written notification to OWNER of its intent to close its file within 30 days and OWNER hereby acknowledges, to the extent allowed by law, that all remaining costs will be deemed to have been abandoned. If SANBAG processes a final bill for payment more than 360 days after notification of completion of OWNER's work, payment of the late bill may be subject to allocation and/or approval by the California Transportation Commission.

The final billing shall be in the form of an itemized statement of the total costs charged to the project, and less any amounts covered by progress billings. However, SANBAG shall not pay final bills which exceed the estimated cost of this Agreement without documentation of the reason for the increase of said cost from the OWNER and approval of documentation by SANBAG. Except, if the final bill exceeds the OWNER's estimated costs solely as the result of a revised Notice to Owner as provided for in Section I, a copy of said revised Notice to Owner shall suffice as documentation. In either case, payment of the amount over the estimated cost of this Agreement may be subject to allocation and/or approval by the California Transportation Commission.

In any event if the final bill exceeds 125% of the estimated cost of this Agreement, an Amended Agreement shall be executed by the parties to this Agreement prior to the payment of the OWNER'S final bill. Any and all increases in costs that are the direct result of deviations from the work described in Section I of this Agreement, shall have the prior concurrence of SANBAG.

Detailed records from which the billing is compiled shall be retained by the OWNER for a period of three years from the date of the final payment and will be available for audit by State and/or Federal auditors. Owner agrees to comply with Contract Cost Principles and Procedures as set forth in 48 CFR, Chapter 1, Part 31, et seq., 23 CFR, Chapter 1, Part 645 and/or 18 CFR, Chapter 1, Parts 101, 201, et al. If a subsequent State and/or Federal audit determines payments to be unallowable, OWNER agrees to reimburse SANBAG upon receipt of SANBAG billing.

V. GENERAL CONDITIONS

All costs accrued by OWNER as a result of SANBAG'S request of August 10, 2009 to review, study and/or prepare relocation plans and estimates for the project associated with this Agreement may be billed pursuant to the terms and conditions of this Agreement.

If SANBAG'S project which precipitated this Agreement is canceled or modified so as to eliminate the necessity of work by OWNER, SANBAG will notify OWNER, in writing, and SANBAG reserves the right to terminate this Agreement by Amendment. The Amendment shall provide mutually acceptable terms and conditions for terminating the Agreement.

OWNER shall submit a Notice of Completion to the SANBAG within 30 days of the completion of the work described herein.

UTILITY AGREEMENT NO. **101**

Such Easement Deeds as deemed necessary by the SANBAG will be delivered to OWNER, conveying new rights of way for portions of the facilities relocated under this Agreement, over available SANBAG owned property outside the limits of the highway right of way.

It is understood that said highway is a Federal aid highway and accordingly, 23 CFR Chapter 1, Part 645 is hereby incorporated into this Agreement by reference; provided, however, that the provisions of any agreements entered into between the SANBAG and the OWNER pursuant to State law for apportioning the obligations and costs to be borne by each, or the use of accounting procedures prescribed by the applicable Federal or State regulatory body and approved by the Federal Highway Administration, shall govern in lieu of the requirements of said 23 CFR 645.

THE ESTIMATED COST TO SANBAG FOR THE ABOVE DESCRIBED WORK IS _____

IN WITNESS WHEREOF, the above parties have executed this Agreement the day and year above written.

SANBAG

By _____
San Bernardino Association Of Governments / Date

: OWNER:
SOUTHERN CALIFORNIA EDISON CO.

By _____
NAME Date

Title _____

APPROVED AS TO FORM:

By _____
General Counsel
San Bernardino Association Of Governments

EXHIBIT 6-B

Utility Tracking Report

EXHIBIT 6-B

UTILITY TRACKING REPORT (Last update: 3/28/2012)					
UTILITY DISPOSITION	**UTILITY**	**APPROX. STATION FROM**	**APPROX. STATION TO**	**APPROX. LENGTH (LF)**	**NOTES**
	Dement St. (I-215), 'DEM' Line				
Relocate	SCG 4"/6" Gas Line (Xing I-215)	24+50.0	28+00.0	365	Relocate into new Dement align. Extend 30" casing under fwy. See also conflict on other side of I-215
Relocate	SCE OH (Xing I-215, 2 wood poles w/12kV Lines; 3 circuits)	19+00.0	19+00.0		May be able to avoid shifting poles (Demont side of I-215), but guying may be an issue. See also conflict on other side of I-215
Relocate	Verizon OH - 2 lines	29+00.0	29+00.0		
Relocate	Verizon FOC - 6 conduits (Xing I-215)	19+50.0	19+50.0	35	Extend 30" casing to edge of R/W
Relocate	Verizon Business (MCI) 2-4" Conduits in 30" Sleeve	19+00.0	19+00.0	55	Extend 30" casing to edge of R/W
Relocate	Verizon Business (MCI) 1 conduit	19+00.0	28+00.0	1,050	Relocate into new Dement align.
Relocate	Sprint FOC UG (2-2" conduits)	19+50.0	28+00.0	1,000	Relocate into new Dement align.
Protect in Place	Sprint FOC 2-2" conduits	28+00.0	30+50.0	190	NW end of Demont
Relocate	Verizon FOC UG (2-2" conduits)	19+50.0	28+00.0	1,000	Relocate into new Dement align.
Protect in Place	Verizon FOC 2-2" conduits	28+00.0	30+50.0	190	NW end of Demont
Protect in Place	SCE UG Single Circuit Cable	26+50.0	26+50.0		
Relocate	SCE Poles (26+00, 27+50, 29+00)				3 poles. 26+00 may be a Verizon pole.
Protect in Place	SCE Poles	15+00.0	27+50.0		Check to make sure not in new Dement align. Also check guying (existing) for conflicts.
	Devore Road Bridge, 'DEV' Line				
Relocate	8" DWC Water	10+00.0	22+00.0	872	Relocate into new Devore Road OC
Protect in Place	2 DWC Manholes (10+50, 10+80)				
Relocate	Verizon 4 Conduits Telco UG	9+80.0	20+00.0	872	Relocate into new Devore Road OC
Protect in Place	TWT 6-2" Conduit HDPE in 20" Sleeve	9+80.0	20+00.0	872	Need to confirm that this is UG and not in existing Devore Rd OC. If UG, utility may still want to relocate into bridge, otherwise may be issues with adjacent properties after construction is completed.
	1 Verizon Manhole				
	N/o Devore Rd Bridge & E/o I215, 'D2' Line				
Relocate	SCG 2" Gas Line	410+50.0	414+00.0	310	May be able to abandon.
Relocate	DWC 2" Water Line	410+30.0	416+00.0	520	May be able to abandon.
Relocate	SCE OH & Verizon Telco, 3 wooden Poles & anchors	410+50.0	417+50.0		
	E/o I215 & S/o I15 ('SF' and 'MRN' Lines)				
Relocate	SCE OH single circuit & 2 poles & anchors (from end of Santa Fe)				
Relocate	SCE OH & 2 poles & anchors (end of Marion Ave.)				
Relocate	SCG 2" Gas Line (end of Marion Ave.)			60	
	Nedlee Ave, 'NED' Line				
Protect in Place	SCG 2" Gas Line	30+00.0	33+05.0	305	
Protect in Place	TWT and L3 6-2" Conduits HDPE	30+00.0	35+50.0	550	
Relocate	TWT and L3 6-2" Conduits HDPE	35+50.0	46+00.0	1,070	Relocate into new Nedlee Ave alignment
Protect/ Relocate	TWT/Level3 6-2: Conduits HDPE in 20" steel sleeve (Xing I-15)	46+00	46+00.0	450	Existing portion in sleeve will be protected in place, but sleeve will need to be extended to R/W line.
Relocate	SCE OH Line (off end of Kimbark Ave)	30+80.0	30+80.0	82	May be able to abandon
Relocate	SCE & Verizon OH to Greenwood Ave (19 poles)	37+30.0	46+98.1	3,800	Extends past end of Nedlee Ave and Greenwood, almost to Kenwood

UTILITY DISPOSITION	UTILITY	APPROX. STATION FROM	APPROX. STATION TO	APPROX. LENGTH (LF)	NOTES
Protect in Place	Sprint & Verizon 4 -2" Conduits PVC	30+00.0	35+00.0	500	
Relocate	Sprint & Verizon 4 -2" Conduits PVC	35+00.0	46+98.1	3,800	Extends past end of Nedlee Ave and Greenwood, almost to Kenwood
Protect in Place	Verizon Bus. (MCI) 1-4" Conduit PVC	30+00.0	35+00.0	500	
Relocate	Verizon Bus. (MCI) 1-4" Conduit PVC	35+00.0	46+98.1	3,800	Extends past end of Nedlee Ave and Greenwood, almost to Kenwood. There also is an empty casing crossing I-15 that will need to be extended.
Protect in Place	DWC 6" Water	30+00.0	32+60.0	260	
	Greenwood Ave, 'GND' Line				
Relocate	SCE OH I-15 Xing - Steel Lattice Poles & 3 circuits				Will cross on a slightly new alignment (Still from the end of Greenwood Ave). Currently working with SCE to deleveop relocation plan.
	Kenwood Ave, 'KEN' Line				
Relocate	1 Manhole (Verizon)	786+00.0	786+00.0		Adjust
Protect in Place	SCG 2" PE Gas	779+50.0	779+50.0		Crosses Kenwood Ave.
Protect in Place	ATT 4" Multiduct	775+64.3	798+81.6	2,320	
Protect in Place	1 SCE Pole (Kenwood)	782+00.0	782+00.0		
Protect in Place	Verizon MCI 1-4" conduit, 2-1 1/8" conduit	786+00.0	798+81.6	1,280	
Protect in Place	Sprint & Verizon 4-2" conduits	786+00.0	798+81.6	1,280	
	I-15 N/o Kenwood Ave, 'A4' Line				
Protect in Place	SCG 36" Gas Line	28+00.0	28+00.0		
Protect in Place	SCE OH Line Xing	37+00.0	37+00.0		
	Cajon Rd N/o Devore Rd, 'CAJ' Line				
Relocate	1 SCE Pole	156+00.0	156+00.0		Pole conflicts with toe of I-15 fill slope
Protect in Place	Sprint, MCI, WT; 4-4" conduits	139+50.0	146+00.0	650	May require some manhole adjustments
Protect in Place	MCI 3-4" empty conduits	117+30.0	139+50.0	2,220	Xing of I-15 at south end.
Relocate	MCI 3-4" empty conduits	117+30.0	117+30.0		Extend case on both sides of I-15
Protect in Place	Level 3/TWT 12-2"	106+25.0	146+00.0	3,980	May require some manhole adjustments.
Protect in Place	AT&T 4-4" conduits	139+00.0	146+00.0	700	May require some manhole adjustments
Protect in Place	SCE UG 2-5" & 6" Conduits	136+50.0	146+00.0	950	May require some manhole adjustments
Protect in Place	14" Oil Line - Kinder Morgan	75+00.0	146+00.0	7,300	
Protect in Place	14" Oil Line - Kinder Morgan	60+80.0	75+00.0		May require retaining wall at toe of slope along 'CD' Line
Protect in Place	8" Oil Line - Kinder Morgan	119+80.0	146+00.0	2,620	
Relocate	SCE - Relocate multiple poles outside of R/W	128+00.0	136+00.0		
Protect in Place	SBMW - 16" Water line	76+00.0	93+00.0	1,650	
Relocate	SBMW - 16" Water line	58+00.0	76+00.0	2,210	Relocate, possibly into Cajon Blvd
Protect in Place	Verizon FO line	49+00.0	59+00.0	1,230	
Protect in Place	SBMW - 24" Water line	49+00.0	55+00.0	840	
Protect in Place	SCE 1-5" Conduit	49+00.0	58+00.0	1,220	

UTILITY	APPROX. STATION FROM	APPROX. STATION TO	APPROX. LENGTH (LF)	NOTES
I-15, S of 15/215 IC, 'A1' line				
SCE OH Lines Xing I-15	762+50.0	762+50.0		
TWT, WT and Charter lines in Glen Helen Parkway	780+00.0	780+00.0		
SCG 2 36" Gas lines Xing under I-15	814+00.0	814+00.0		
WT 1-2" Conduit in Glen Helen Road	826+50.0	826+50.0		
Verizon OH line on Glen Helen Road	826+50.0	826+50.0		
Verizon 1-3" Telephone in Glen Helen Road	827+00.0	827+00.0		
SCE 1-5" Conduit in Glen Helen Road	827+00.0	827+00.0		
SCE OH line on Glen Helen Road and along I-15 (NB)	827+00.0	836+30.0		
Kinder Morgan 8" oil line in 24" STL Casing E/o RR Xing	843+00.0	843+00.0	200	At RR Crossing
Cajon Junction, 'CJNCT' Line				
DWC 2" Water (South side), continues past end of street	10+00.0	20+11.9	1,720	
DWC 2" Water (North side)	10+00.0	18+00.0	2,210	
SCE, V OH Electric, Telephone	10+00.0	20+11.9	1,340	
SCE, V OH Electric, Telephone, next to 'CD' Line (5 poles)				Near Station 923+00 to 923+00 of 'CD' Line. Utility probably will just eliminate these poles (instead of relocate).
Verizon Fiber Optic			1,340	
Cajon Rd S/o Devore Rd. 'CAJ' Line				
SCE, Verizon OH, 4 wood poles & anchors	45+50.0	47+50.0		Relocate outside of planned intersection
Verizon Telco OH, 1 pole, N side of intersection	46+30.0	46+30.0		Relocate outside of new Devore Road alignment
SCE, Verizon OH, 1 pole, N side of street	43+50.0	43+50.0		
SCE, 6 poles, N side of street	39+00.0	41+00.0		Line heads toward fwy, paralleling gas line. Relocate outside new R/W
SBMW 16" Water Steel	33+09.0	49+00.0	1,600	
DWC 8" Water	40+50.0	49+00.0	860	
SBMW 12" Water	37+50.0	49+00.0	1,150	Crosses Cajon Blvd at 37+50 and reduces to 6" line
SBMW 24" Water DIP	33+09.0	49+00.0	1,600	
Verizon Telco OH (S side of street)	38+50.0	44+50.0	600	
Charter fiber optic OH (S side of street)	33+09.0	49+00.0	1,600	
Verizon fiber optic (2 conduits), S side of street	33+09.0	49+00.0	1,600	
SCG 16" Gas	33+09.0	38+20.0	520	
SCG 6" Gas	39+00.0	41+00.0	470	Move outside of new R/W. Extend casing at I-215 freeway.
SCG 4" Gas	33+09.0	38+20.0	520	
6" Water	33+09.0	37+50.0	492	
I-215 South of I-15, 'B1' Line				
MCI 2-4" conduits in 30" sleeve	897+50.0	897+50.0	130	Extend casing on each side of freeway
Sprint & Verizon, 4-2" Conduits in 30" sleeve	898+00.0	898+00.0	130	Extend casing on each side of freeway
SCE pole, S side of freeway	867+70.0	867+70.0		Relocate pole outside of new R/W

EXHIBIT 6-C

Utility Plan Sheets

Exhibit 6-C: Utility Plan Sheet

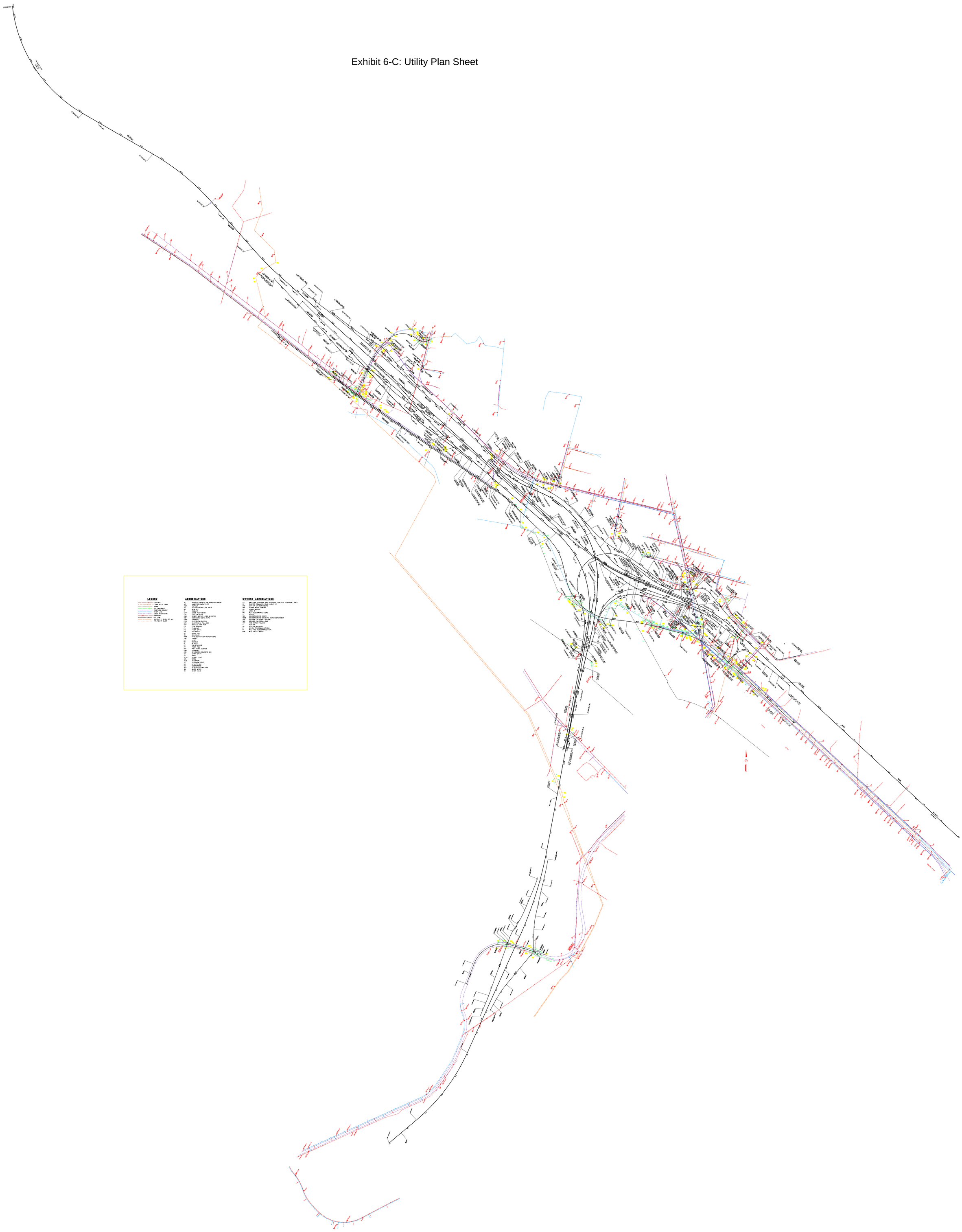


EXHIBIT 6-D

Utility Pot Hole Ties

EXHIBIT 6-D

Utility Pot Hole ties - I-15 / I-215 Devore Interchange
JN 177652 (07-040)
Updated: 2/29/2012

* TF Elev. = Top of feature located

PH No.	Northing	Easting	FS Elev.	Dip	TF Elev.*	Owner	Target Facility	Feature Found / Comments
UNCONSTRICTED								
28	1908768.56	6735327.52	2349.89	4.35	2345.54	Verizon	fiber optic	concrete encasement
29	1909203.10	6735570.18	2401.60	5.58	2396.02	Verizon	fiber optic	4" pvc duct
30	1909218.70	6735587.32	2404.09	4.35	2399.74	VB	fiber optic	4" pvc duct
31	1909233.92	6735604.51	2406.94	3.65	2403.29	Sprint / ATT	fiber optic	concrete encasement
32	1909266.36	6735564.15	2407.08	2.82	2404.26	ATT	fiber optic	concrete encasement
33	1909356.28	6735710.68	2423.00	N/A		Verizon	FO MH	TEL MH
34	1909358.04	6735720.83	2423.74	3.55	2420.19	VB	fiber optic	4" pvc duct
35	1909358.33	6735721.27	2423.75	5.10	2418.65	Verizon	fiber optic	4" steel duct
36	1909353.15	6735728.56	2423.61	3.22	2420.39	Sprint	fiber optic	concrete encasement
37	1909373.68	6735740.62	2425.65	5.08	2420.57	VB	fiber optic	4" pvc duct
38	1909368.54	6735744.45	2425.42	3.05	2422.37	Sprint	fiber optic	concrete encasement
39	1909371.43	6735754.78	2425.35	N/A		Sprint	FO MH	MH
42	1909510.84	6735837.92	2440.46	3.05	2437.41	ATT	fiber optic	concrete encasement
46	1909529.72	6736305.95	2472.68	2.94	2469.74	SC Gas	gas	2" steel line
47	1909557.03	6736318.65	2472.31	4.02	2468.29	ATT	fiber optic	concrete encasement - found 2" steel gas line in same hole at EL. 2469.66
48	1909524.10	6736337.50	2473.16	2.80	2470.36	ATT	fiber optic	concrete encasement
53	1908797.19	6736448.34	2452.22	4.28	2447.94	SC Gas	gas	2" steel line
69						TWT/L3	fiber optic	in I-15 median - pothole not dug
70	1907013.00	6737992.87	2314.32	0.40	not found	TWT/L3	fiber optic	dig thru AC hit slurry - dry hole; depth = 0.4'
70A	1907008.76	6737977.56	2314.81	14.00	not found	TWT/L3	fiber optic	dry hole; depth = 14.0'
70B	1907002.01	6737984.62	2314.19	16.00	not found	TWT/L3	fiber optic	CL 1' x 4' trench - dry hole; depth = 16.0'
70C	1907008.17	6738003.47	2313.62	4.80	2308.82	TWT/L3	fiber optic	9 - 2" ducts
79	1906412.22	6738967.88	2274.12	4.50	2269.62	VB	fiber optic	4" pvc duct
80	1906425.55	6738996.26	2274.74	0.03	2274.71	TWT	fiber optic	concrete encasement
81	1906416.28	6739087.58	2278.23	2.72	2275.51	SC Gas	gas	2" pvc line
82	1906382.60	6739175.83	2280.00	0.03	2279.97	TWT	fiber optic	concrete encasement
83	1906381.32	6739207.19	2280.44	3.60	2276.84	Sprint	fiber optic	concrete encasement
84	1906349.56	6739227.11	2280.51	3.38	2277.13	VB	fiber optic	4" pvc duct
85	1906360.70	6739330.82	2283.15	3.42	2279.73	SC Gas	gas	2" pvc line
99						Verizon	fiber optic	Verizon has confirmed it's an overhead line.
108	1903237.98	6742152.25	2063.97	3.04	2060.93	SBMW	water	12" cast iron line
110	1903287.52	6742212.53	2065.89	6.34	2059.55	SBMW	water	24" steel line
113	1903400.67	6742268.21	2072.71	2.00	2070.71	Devore WC	water	8" steel line (DWC) - found in lieu of TWT
113A	1903399.68	6742267.99	2072.40	N/A	not found	TWT	fiber optic	Dry hole - down ?' - Not Found
113B	1903398.48	6742263.99	2072.63	N/A	not found	TWT	fiber optic	Dry hole - down ?' - TWT not found
113C	1903399.35	6742257.75	2073.11	1.08	2072.03	unknown	fiber optic	4" steel line - found in lieu of TWT
113D	1903400.08	6742269.53	2073.28	8.00	not found	TWT	fiber optic	Dry hole - down 8' - TWT not found
115	1903221.84	6742301.12	2060.25	2.78	2057.47	Devore WC	water	8" steel line
116	1903199.75	6742354.34	2057.89	2.30	2055.59	Verizon	fiber optic	3 - 4" ducts
118	1902978.73	6742453.28	2044.52	N/A	2044.52	Verizon	FO MH	MH / vault
125	1902926.50	6742630.59	2036.39	4.60	2031.79	SBMW	water	24" steel line
127	1902814.14	6742636.98	2033.16	2.85	2030.31	Verizon	fiber optic	2- 4" pvc ducts
128	1902781.30	6742677.41	2032.14	2.65	2029.49	SBMW	water	8" steel line; USA markings for 12" W
130	1902700.55	6742927.07	2027.77	3.90	2023.87	SC Gas	gas	6" steel line
131	1902706.56	6742880.02	2028.13	4.20	2023.93	SBMW	water	24" steel line
140	1902013.09	6743540.81	2008.50	3.75	2004.75	VB	fiber optic	4" pvc duct
142	1901997.47	6743552.89	2008.02	3.82	2004.20	Sprint	fiber optic	concrete encasement
147	1902637.39	6742989.42	2025.79	4.85	2020.94	SC Gas	gas	4" steel line
149	1902733.99	6743353.89	2018.37	3.55	2014.82	Sprint	fiber optic	concrete encasement
150	1902712.50	6743374.93	2019.99	5.15	2014.84	VB	fiber optic	4" pvc duct
151	1902811.23	6743422.94	2021.90	5.18	2016.72	Sprint	fiber optic	concrete encasement
152	1902788.68	6743449.53	2019.99	4.45	2015.54	VB	fiber optic	4" pvc duct

PH No.	Northing	Easting	FS Elev.	Dip	TF Elev.*	Owner	Target Facility	Feature Found / Comments
UNCONSTRICTED								
153	1902957.75	6743585.72	2027.82	4.30	2023.52	VB	fiber optic	1" pvc duct @ VB vault
154	1902997.33	6743581.58	2029.24	3.74	2025.50	VB	fiber optic	concrete encasement
155	1903343.71	6743239.65	2053.64	3.65	2049.99	SC Gas	gas	6" steel line
156	1903444.07	6743147.76	2061.00	3.80	2057.20	Verizon	fiber optic	4" pvc duct @ EL. 2057.20 - 2nd 4" pvc duct @ EL. 2056.80
157	1903565.93	6743019.14	2069.86	3.32	2066.54	SC Gas	gas	6" steel line
158	1903576.59	6742976.75	2074.50	4.25	2070.25	VB	fiber optic	4" pvc duct
159	1903600.19	6742985.28	2073.73	3.14	2070.59	Sprint	fiber optic	concrete encasement
163	1904133.68	6742155.23	2130.94	6.80	2124.14	Verizon	fiber optic	concrete encasement
164	1904215.54	6742097.68	2136.47	2.58	2133.89	Devore WC	water	8" steel line
164A	1904259.44	6742127.04	2139.13	0.80	2138.33	Verizon	fiber optic	concrete encasement
165	1904279.45	6742073.81	2141.37	2.94	2138.43	SC Gas	gas	2" steel line
173	1905329.30	6740510.38	2213.09	1.62	2211.47	Devore WC	water	2" steel line
CONSTRICTED								
2	1911030.67	6733354.70	2531.57	6.21	2525.36	SC Gas	36" Gas	steel
3						SC Gas	36" Gas	In median, not dug
4	1910919.85	6733145.32	2522.76	17.92	2504.84	SC Gas	36" Gas	steel
5	1910735.43	6732967.35	2421.88	4.61	2417.27	SC Gas	36" Gas	steel
6	1910667.24	6732982.14	2415.99	3.80	2412.19	SC Gas	36" Gas	steel
7	1908706.55	6734554.04	2307.27	0.18	2307.09	TWT & L3	Fiber Optic	Encasement. Bottom of encasement from FS = 4.14'.
8	1908715.68	6734560.16	2306.79	3.32	2303.47	VB, ATT & S	Fiber Optic	4-4"C PVC - common duct bank w/8,9
9						WT (now L3)	Fiber Optic	4-4"C PVC - common duct bank w/8,9
10	1908659.27	6734590.31	2307.72	3.02	2304.70	Kinder Morgan	8" Oil	Steel with coating.
11	1908637.42	6734607.40	2307.53	3.24	2304.29	Kinder Morgan	14" Oil	steel
12	1908373.76	6734993.55	2296.95	0.18	2296.77	TWT & L3	Fiber Optic	Slurry encasement. Bottom of encasement from FS = 2.50'.
13	1908380.37	6734996.35	2296.81	2.69	2294.12	VB, ATT & S	Fiber Optic	4-4"C PVC - common duct bank w/13,14
14						WT (now L3)	Fiber Optic	4-4"C PVC - common duct bank w/13,14
15	1908386.73	6735110.29	2297.67	2.74	2294.93	ATT	Fiber Optic	4" multiduct
16	1908403.00	6735165.80	2303.90	3.64	2300.26	Verizon	Fiber Optic	4-4" & 2-2" transite conduits
17	1908419.57	6735174.47	2306.85	3.43	2303.42	VB	Fiber Optic	1 - 4" C
18	1908446.21	6735200.66	2315.33	4.15	2311.18	S & V	Fiber Optic	encasement
19	1908296.12	6735124.40	2291.30	4.32	2286.98	VB	Fiber Optic	1 - conduit measured depth inside manhole on West side.
19	1908296.12	6735124.40	2291.30	4.35	2286.95	VB	Fiber Optic	1 - conduit measured depth inside manhole on North side.
19	1908296.12	6735124.40	2291.30	4.32	2286.98	VB	Fiber Optic	1 - conduit measured depth inside manhole on East side.
19-A	1908279.36	6735146.42	2290.53	4.95	2285.58	VB	Fiber Optic	3 - 4" conduits. Measured depth inside MH on West side.
19-A	1908279.36	6735146.42	2290.53	4.19	2286.34	ATT	Fiber Optic	4" conduits. Measured depth inside MH on West side.
19-A	1908279.36	6735146.42	2290.53	4.5	2286.03	S & V	Fiber Optic	4 - 2" conduits. Measured depth inside MH on north side.
19-A	1908279.36	6735146.42	2290.53	3.98	2286.55	?	Fiber Optic	1 conduit. Measured depth inside MH on South side.
20	1908247.22	6735165.36	2289.14	0.8	2288.34	TWT & L3	Fiber Optic	12 - 2"C (HDPE) ? Encasement. Bottom of encasement is 3.62' below FS elevation.
21	1908152.04	6735141.33	2285.86	3.29	2282.57	VB	Fiber Optic	2 - 4" C (Steel)
22	1908218.19	6735160.24	2288.96	4.09	2284.87	Kinder Morgan	14" Oil	steel
23	1908205.87	6735190.39	2287.84	3.04	2284.80	Kinder Morgan	8" Oil	Steel with coating.
24	1908681.53	6735297.21	2340.12	4.12	2336.00	VB	Fiber Optic	1 - 4" C (PVC)
25	1908697.76	6735295.86	2341.26	3.98	2337.28	Verizon	Fiber Optic	4-4" & 2-2" (TRANSITE)
26	1908711.83	6735318.38	2345.10	3.99	2341.11	S & V	Fiber Optic	4 - 2" C (PVC) - encasement
27	1908752.25	6735272.20	2346.11	3.10	2343.01	ATT	Fiber Optic	4" P (multi) - encasement
40	1909221.33	6735855.59	2411.81	4.27	2407.54	VB	Fiber Optic	4" C (PVC)
41	1909224.63	6735859.80	2411.85	3.76	2408.09	Sprint	Tel	encasement
43	1909547.24	6735869.88	2444.61	2.55	2442.06	Devore WC	Water	6" steel
44	1909624.34	6736251.63	2471.43	3.10	2468.33	SC Gas	2" Gas	steel
45	1909625.03	6736256.76	2471.57	3.45	2468.12	Devore WC	Water	6" steel
49	1909445.26	6736353.45	2475.12	2.64	2472.48	SC Gas	2" Gas	steel
50	1909402.38	6736610.13	2480.72	3.44	2477.28	SC Gas	2" Gas	steel. Also found 6"unknown pipe in this location.
51	1909366.13	6736489.92	2474.56	4.02	2470.54	SC Gas	2" Gas	steel
52	1909388.58	6736425.59	2472.25	3.91	2468.34	ATT	Fiber Optic	encasement
54	1907923.67	6735622.67	2268.47	3.63	2264.84	VB	Fiber Optic	Suppose to be 3 - 4" conduits, found 2-4" PVC conduit.
55	1907949.67	6735527.77	2272.55	3.94	2268.61	Kinder Morgan	14" Oil	steel

PH No.	Northing	Easting	FS Elev.	Dip	TF Elev.*	Owner	Target Facility	Feature Found / Comments
CONSTRICTED								
56	1907969.36	6735518.30	2273.16	3.08	2270.08	Kinder Morgan	8" Oil	Steel with coating.
57	1907888.59	6735657.54	2267.02	0.16	2266.86	TWT & L3	Fiber Optic	12 - 2" C (HDPE)per plans, found encasement. Bottom of encasement from FS = 4.38'.
58	1907205.84	1907205.84	2271.27	2.55	2268.72	Kinder Morgan	8" Oil	Steel. Looks like a 45 degree elbow here.
59	1907170.57	6736659.17	2272.28	3.93	2268.35	Kinder Morgan	14" Oil	steel
60	1907108.66	6736639.58	2268.87	4.52	2264.35	Kinder Morgan	8" Oil	Steel with coating.
61	1907073.91	6736850.66	2274.65	0.16	2274.49	TWT & L3	Fiber Optic	12 - 2" C (HDPE)per plans. Found conc. cap. Bottom of conc. Cap from FS = 1.25'.
62	1907084.90	6736842.82	2274.24	3.5	2270.74	VB	Fiber Optic	Plans call for 3 - 4" conduits. Found 2-4" conduits about 50' North of 62A.
62A	1907051.66	6736902.69	2275.24	5.33	2269.91	VB	Fiber Optic	found 2 pull boxes at angle point
63						VB	Fiber Optic	1 - 4" (PVC) ? Not potholed since VB could not locate it.
64						VB	Fiber Optic	In median, not dug
65	1907876.92	6737097.10	2300.02	6'	not found	VB	Fiber Optic	Dug down 6'. Vacuum could not lift rock out of hole due to the 30+' lift height to the machine and the over 100+' of hose run. Not found
66	1906343.57	6737957.87	2247.81	5.71	2242.10	TWT & L3	Fiber Optic	4 - 2" PVC conduit. (2- white and 2- black). Note: 2 holes dug to find this.
66A	1906342	6737960	2247.5	9.5'	not found	TWT & L3	Fiber Optic	Dug 1'x4' trench 9.5' deep, not found @ this location. Location is approximate.
67	1906296.90	6737960.78	2245.64	4.01	2241.63	Kinder Morgan	14" Oil	steel
68	1906412.75	6737961.88	2244.01	10.51	2233.50	TWT & L3	Fiber Optic	4 - 2" PVC conduit. (2- white and 2- black).
71	1906055.88	6738318.06	2224.97	3.65	2221.32	Kinder Morgan	14" Oil	Steel. Angle point, pipe turns southwest.
72	1905825.61	6738500.50	2206.98	5.44	2201.54	Kinder Morgan	14" Oil	steel
73	1905592.94	6738537.16	2156.90	15.84	2141.06	Kinder Morgan	14" Oil	Attempted - stopped at 13'. Later continued and found.
74	1905444.96	6738600.26	2142.39	13.20	2129.19	Kinder Morgan	14" Oil	steel
75	1905354.56	6738845.80	2139.73	16.05	2123.68	Kinder Morgan	14" Oil	steel
76	1905097.00	6738952.63	2125.89	14.80	2111.09	Kinder Morgan	14" Oil	steel
77	1905291.17	6739082.75	2137.53	6.18	2131.35	SBWD	16" Water	steel
78	1906440.85	6738966.77	2273.01	2.28	2270.73	S & V	Fiber Optic	encasement
86	1903945.27	6739623.61	2092.12	6'	not found	SBMW	16" Water	Location was moved per Jesus w/ Caltrans.
86A	1903886.73	6739709.31	2095.88	6'	not found	SBWD	16" Water	SBMWD later moved marking locations. Tried 4
86B	1903948.43	6739643.04	2097.00	9'	not found	SBWD	16" Water	times. Not found due to rip rap, cave ins &
86C	1903787.21	6739835.36	2093.19	21' x 4' w	not found	SBMW	16" Water	mismarking.
87	1903885.36	6739671.09	2088.80	4.82	2083.98	Kinder Morgan	14" Oil	steel
88	1903696.16	6739939.09	2083.74	6.18	2077.56	Kinder Morgan	14" Oil	steel
89	1903420	6740342	2075	6'	not found	SBWD	16" Water	Dug at USA marking near angle pt. SBMWD later remarked and indicated 16" water is not here. Not found. Location is approximate.
89A	1903917.75	6740582.37	2100.35	6.67	2093.68	SBWD	16" Water	Pothole requested by Jesus with Caltrans.
89B	1903477.92	6740272.85	2076.09	5.54	2070.55	SBWD	16" Water	New location for 89 per SBMWD remarking.
90	1903407.12	6740344.83	2074.65	12.92	2061.73	Kinder Morgan	14" Oil	steel
91	1903438.97	6740431.26	2074.39	13.48	2060.91	Kinder Morgan	14" Oil	steel
91A	1903621.39	6740489.14	2082.94	19.00	2063.94	Kinder Morgan		steel
91B	1903836.60	6740586.36	2095.86	12.50	2083.36	Kinder Morgan		steel
92	1903811.34	6740715.12	2105.49	5.12	2100.37	SBWD	16" Water	steel
93	1903704.45	6740819.01	2100.91	7.38	2093.53	Kinder Morgan	14" Oil	steel
94	1903512.66	6741149.99	2091.97	2.84	2089.13	SCE	electrical	4" conduit, West side. Measured from inside of vault.
94	1903512.66	6741149.99	2091.97	2.75	2089.22	SCE	electrical	4" conduit, West side. Measured from inside of vault.
94	1903512.66	6741149.99	2091.97	2.27	2089.70	SCE	electrical	4" conduit, South side. Measured from inside of vault.
95	1903443.02	6741320.04	2086.77	4.19	2082.58	SBWD	16" Water	steel
96	1903398.93	6741368.13	2085.11	1.94	2083.17	SCE	electrical	encasement. Had tele or FO on top at 1.75'.
97	1903389.14	6741498.07	2081.40	4.08	2077.32	SBWD	16" Water	16" x 24" Tee
98	1903279.64	6741058.35	2071.45	4.43	2067.02	Kinder Morgan	14" Oil	steel
100	1903585.25	6741894.28	2089.20	1.83	2087.37	SBWD	water	2" water
101						Verizon	Fiber Optic	Not dug - it's overhead.
102	1903327.93	6741755.36	2074.18	4.14	2070.04	SBMW	12" Water	steel
103	1903282.14	6741956.52	2068.85	3.24	2065.61	SBWD	16" Water	Steel. 12" water line found in hole at 1.99'.
104	1903233.61	6741976.50	2066.34	3.76	2062.58	SBWD	16" Water	Steel. 1/2" PVC C in same hole at 0.80'.

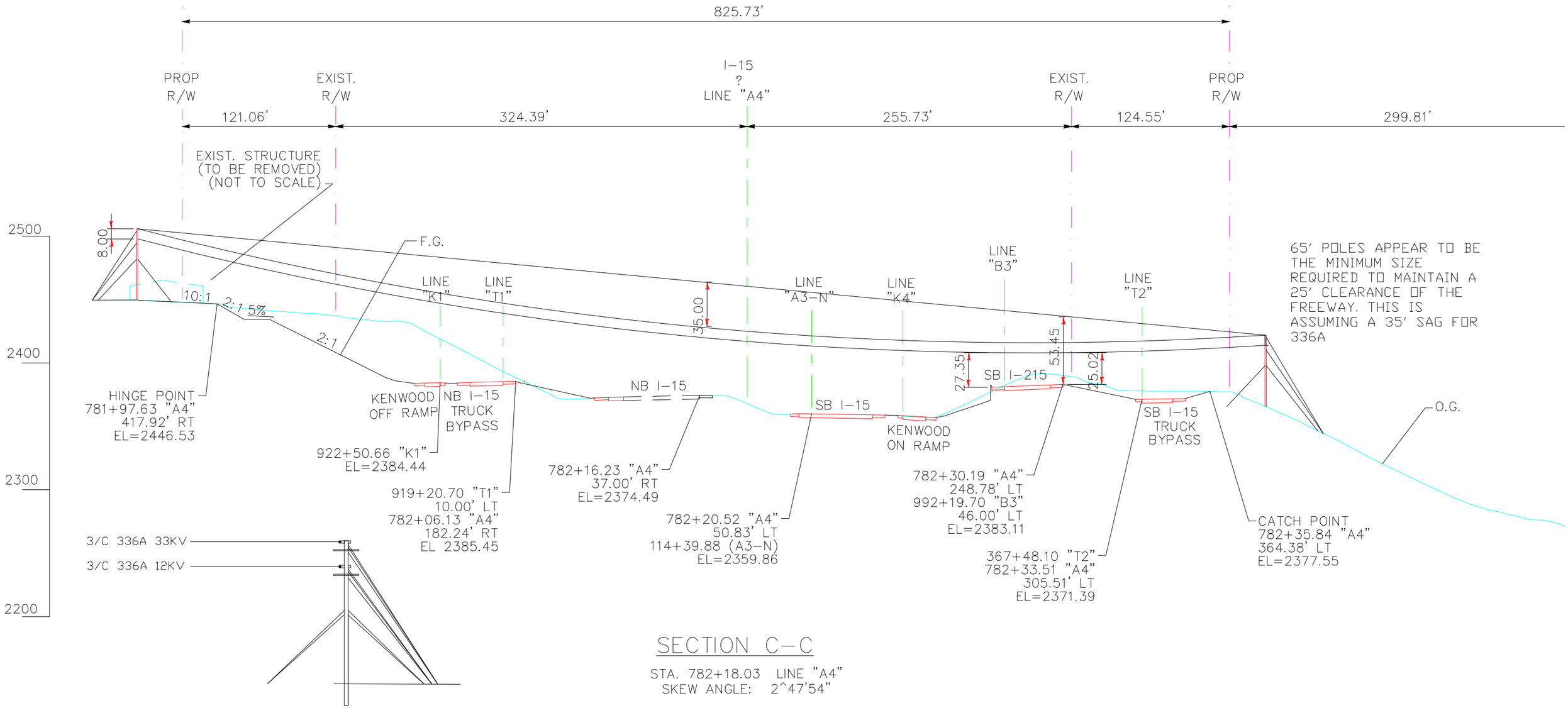
PH No.	Northing	Easting	FS Elev.	Dip	TF Elev.*	Owner	Target Facility	Feature Found / Comments
CONSTRICTED								
105	1903239.85	6742067.96	2065.95	1.95	2064.00	SCE	electrical	SCE encasement. Also found Verizon direct burial, one at 0.85' and 2 at 1.90', and a 4" PVC conduit at 1.25'.
106	1903235.61	6742167.67	2063.90	4.62	2059.28	SBWD	24" Water	Steel. This is 45 degree elbow.
107	1903211.87	6742199.02	2062.61	2.35	2060.26	Verizon	Fiber Optic	1-2" steel conduit.
109	1903187.95	6742210.75	2061.53	6.04	2055.49	SBWD	16" Water	steel
111						SBWD	8" Water	SBMW does not have facility in this area. Not dug.
112	1903516.25	6742287.83	2081.26	2.87	2078.39	Verizon	telephone	4-4" PVC conduit with 4" steel pipe crossing at 1.80'.
114	1903099.01	6742320.35	2053.00	15'		TWT & L3	Fiber Optic	Plans call out 6 - 2" C (HDPE) in 20" sleeve. Too deep to pothole; estimated at 35' per Mike Garcia w/ Level 3. Moved it to SS of Cajon Blvd. and attempted, hit rock at 15', not found.
117						Charter	Fiber Optic	Charter indicates they do not have UG facilities in this area - all overhead.
126						Charter	Fiber Optic	Charter indicates they do not have UG facilities in this area - all overhead.
129	1902824.14	6742614.94	2034.86	3.33	2031.53	SBWD	16" Water	steel
132	1902558.75	6742914.73	2027.44	4.45	2022.99	Verizon	Fiber Optic	3-4" PVC conduit.
133	1902524.47	6742892.97	2027.60	5.67	2021.93	SC Gas	16" Gas	steel
134	1902547.76	6742955.92	2025.60	4.58	2021.02	SC Gas	2" Gas	High pressure bypass per SC Gas representative.
135	1902442.18	6743078.20	2021.92	5.29	2016.63	S & V	Fiber Optic	Measured inside manhole.
136	1902411.46	6743107.88	2020.95	4.65	2016.30	VB	Fiber Optic	Measured inside manhole.
137	1902342.31	6743154.07	2020.58	4.97	2015.61	Charter	Fiber Optic	Picked up 2-4" PVC Verizon FO conduits in this area. Charter has no UG facilities here.
138	1902255.66	6743262.70	2016.77	3.92	2012.85	SC Gas	6" Gas	steel
139	1902033.11	6743501.61	2009.82	3.44	2006.38	SC Gas	6" Gas	steel
141	1901984.50	6743528.95	2009.37	4.52	2004.85	Verizon	Fiber Optic	2-4" PVC conduits.
143	1902555.09	6743227.72	2020.36	5.10	2015.26	VB	Fiber Optic	4" PVC C
144	1902557.63	6743182.91	2019.91	3.40	2016.51	Sprint, Verizon?	Fiber Optic	4-2" C per plans. Encasement
145	1902551.33	6743071.63	2022.49	3.43	2019.06	SBMW	24" Water	Found ductile iron pipe.
146	1902592.89	6743003.08	2024.98	3.84	2021.14	SC Gas	4" Gas	PE pipe.
148	1903147.03	6743046.98	2044.65	11.94	2032.71	SC Gas	6" gas	Attempted - rock cave in. Kana said need to use back hoe. Dug with vac machine and got it.
160	1903930.85	6742812.73	2099.08	3.75	2095.33	VB	Fiber Optic	4" PVC C
161	1903958.82	6742821.62	2102.59	2.73	2099.86	Sprint, Verizon?	Fiber Optic	
162	1903953.93	6742836.03	2102.11	2.94	2099.17	SC Gas	6" Gas	Found 4" steel gas line.
166	1904314.67	6742071.93	2143.92		not found	TWT & L3	Fiber Optic	Dug 8' deep on wrong markings. New location too deep per Level 3's Mike Garcia. Not found.
167	1904440.62	6742039.10	2152.51	2.90	2149.61	SC Gas	2" Gas	Steel. 2' south of angle point.
168	1904468	6142028	2154	4.00		TWT & L3	Fiber Optic	Dug 4.12' - not found. L3 remarked. This is an approximate location.
168A	1904450.53	6742034.43	2153.12	4.19	2148.93	TWT & L3	Fiber Optic	18 - 2"C (HDPE) Did not confirm number, it's per TWT & L3.
169	1904449.60	6742039.56	2153.07	2.06	2151.01	Devore WC	4" Water	steel
170	1904454.46	6742090.56	2152.85	2.40	2150.45	Devore WC	8" Water	steel
171	1904904.67	6741187.88	2181.09	2.42	2178.67	Devore WC	4" Water	Top of concrete thrust block by FH, end of line.
172	1904909.58	6741157.32	2179.61	3.03	2176.58	SC Gas	2" Gas	PE pipe.
174	1905316.42	6740539.16	2212.41	2.93	2209.48	SC Gas	2" Gas	steel
175	1905317.00	6740535.11	2212.47	0.93	2211.54	Devore WC	water	1 1/4" steel water line.
176	1902986.04	6739555.80	2087.10	1.82	2085.28	Kinder Morgan	8" Oil	steel
177	1902915.29	6739656.78	2085.42	7.90	2077.52	Kinder Morgan	8" Oil	steel
178						Kinder Morgan	8" Oil	In median, not dug.
179	1902645.59	6740049.81	2075.51	8.00	2067.51	Kinder Morgan	8" Oil	steel
180	1902597.58	6740066.95	2075.17	5.60	2069.57	Kinder Morgan	8" Oil	steel

PH No.	Northing	Easting	FS Elev.	Dip	TF Elev.*	Owner	Target Facility	Feature Found / Comments
CONSTRICTED								
181	1902540.93	6740065.31	2075.16	6.65	2068.51	Kinder Morgan	8" Oil	steel
182	1901204.11	6739565.52	2056.17	3.30	2052.87	SCE	electrical	1 - 6" PVC C
183	1901210.83	6739565.20	2055.85	3.32	2052.53	Verizon	telephone	2 - 4" PVC C
184	1901151.61	6739562.67	2055.45	4.40	2051.05	VB	Fiber Optic	1 - 2" C (Steel)
185	1900221.26	6739283.03	2072.63	6.15	2066.48	SC Gas	36" Gas	steel
186	1900130.94	6739269.79	2072.32	4.88	2067.44	SC Gas	36" Gas	steel
187	1899894.53	6739410.25	2071.63	6.13	2065.50	SC Gas	36" Gas	steel
188	1899801.85	6739397.14	2070.24	3.85	2066.39	SC Gas	36" Gas	steel
189	1896665.62	6738078.40	2031.50	3.97	2027.53	TWT	Fiber Optic	6 - 2"C (2-PE & 4-PVC). Casing not found.
190	1896745.68	6738119.66	2034.61	9.72	2024.89	Verizon	Fiber Optic	2-4" PVC C
191	1896750.77	6738152.41	2033.93	10.75	2023.18	VB	Fiber Optic	1 - 2"C (Steel)
192	1896661.09	6738294.07	2028.93	3.48	2025.45	TWT	Fiber Optic	6 - 2"C (2-PE & 4-PVC). Casing not found.
193	1896720.91	6738308.84	2030.69	3.25	2027.44	Verizon	Fiber Optic	encasement
194	1896717.13	6738338.71	2030.13	1.15	2028.98	VB	Fiber Optic	encasement
195	1896556.40	6738711.55	2015.42	0.58	2014.84	TWT	Fiber Optic	Encasement. Bottom of encasement from FS = 3.92'.
196	1896631.05	6738669.36	2018.60	3.55	2015.05	Verizon	Fiber Optic	4" PVC C
197	1896614.53	6738719.84	2016.78	4.85	2011.93	VB	Fiber Optic	1 - 2"C (Steel)
198	1896473.19	6738852.05	2011.11	14.68	1996.43	TWT	Fiber Optic	6 - 2"C (2-PE & 4-PVC). Casing not found.
199	1896471.79	6739014.46	2010.72	6.70	2004.02	VB	Fiber Optic	1 - 2"C (Steel)

EXHIBIT 6-E

Preliminary SCE Relocation Plan

EXHIBIT 6-E: Preliminary SCE Relocation Plan



65' POLES APPEAR TO BE THE MINIMUM SIZE REQUIRED TO MAINTAIN A 25' CLEARANCE OF THE FREEWAY. THIS IS ASSUMING A 35' SAG FOR 336A

SECTION C-C

STA. 782+18.03 LINE "A4"
SKEW ANGLE: 2^47'54"

SHEET INDEX

SHEET No.	DESCRIPTION
1–2	LAYOUT
3	TYPICAL CROSS SECTION
4–8	CROSS SECTIONS
9–16	PROFILES
17–18	EXISTING TOPOGRAPHY

LEGEND:

INDICATES POWERPOLE(S) AND ASSOCIATED OH LINE IN CONFLICT

EXIST R/W
OH FIBER OPTIC (VERIZON)
EXIST R/W
PROPOSED R/W
CUT/FILL LINE
EXIST R/W
'GND' LINE
10.00 WIDE SLOPE EASEMENT
71.15
118.7
150
150
150
133
130.22
PROPOSED R/W
444.85
150
150
150
150
150
150
118.59
PROPOSED R/W
OH ELEC
OH FIBER OPTIC (VERIZON)
EXIST R/W
PP #1714977E W/TRANS & METER
'NED' LINE
OH ELECTRIC
EXIST R/W
PP #1714979E
PP #1714978E
157.82
NEDLEE AVENUE
PP #1714970E
PP #4719599E
PP #1714972E
PROPOSED R/W
EXIST R/W
PP #18454Y
'K2' LINE
'K1' LINE
END 'A4' 79+73.81 BACK
BEG 'A4' 0+00.00 AHEAD
EXIST. SCE LINE
'T1' LINE
NB I–15
'A4' LINE
'K4' LINE
'T2' LINE
'B3' LINE
SB I–215
SB I–15
'A3–N' LINE
SB I–15 TRUCK BYPASS
EXIST R/W
EXIST R/W
EXIST R/W
OH ELEC
CUT/FILL LINE
PROPOSED R/W
CAJON BLVD
'CAJ' LINE
'T2' LINE
'T1' LINE
'A4' LINE
'B3' LINE
'A3' LINE
'CAJ' LINE
PROPOSED R/W
CAJON BLVD
EXIST R/W
NB I–15
NB I–215
SB I–15
SB I–215
MATCH LINE SHEET L-2
MATCH LINE SHEET L-1

SCE CONFLICT MAP LAYOUT
SCALE: 1" = 100'

SCE CONFLICT MAP LAYOUT
SCALE: 1" = 100'

L–1

USERNAME =>$USER
DGN FILE => $REQUEST

RELATIVE BORDER SCALE IS IN INCHES
0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 08000003661

08000003661

EXHIBIT 6-F

SCG Requirements

EXHIBIT 6-F: SCG Requirements

Southern California Gas Company
A Sempra Energy utility℠

February 9, 2011

Southern California Gas Company

9400 Oakdale Avenue
Chatsworth, CA
91313

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91313-2300
M.L.9314

tel 818-701-3225
fax 818-701-3441

Overland, Pacific & Cutler, Inc
3750 Schaufele Ave, Suite 150
Long Beach, CA 90808
Attn: Esayas Hagos

Re: Devore Interchange Reconstruction Project – Plan File 202.10.4000.4002

Southern California Gas Company-Transmission Department (The Gas Company) has received your request for Design Specifications within the Southern California Gas Company Easement. The Gas Company operates and maintains two (2) 36-Inch high pressure natural gas lines within the limits of your construction project. The Gas Company provides the following design parameters for construction near our Gas Line and requires the line be protected in place.

Design parameters for The Gas Company shall include:

- Consideration be given to the safety of our pipeline during the design and construction stages.
- No mechanical equipment will be permitted to operate within three horizontal feet of the pipeline, and any closer work must be done by hand. No heavy equipment to cross pipeline without Gas Company Representative's approval.
- A representative of The Gas Company must observe the excavation around or near our facilities to insure protection and to record pertinent data necessary for our operations.
- Vertical clearance of at least two (2) feet between High Pressure Gas Facilities and any substructure crossing, and all laterals must cross perpendicular to the gas facilities.
- All equipment crossing gas easement must be approved by the Gas Company Representative, and all crossings require a minimum of seven (7) feet of cover over gas facilities.
- Only rubber tire, light loading equipment will be allowed to work within the Gas Company Easement and no mechanical equipment will be permitted to operate within two (2) vertical feet of the pipeline. Any closer work must be performed by hand.
- A Construction Note to be placed on plans requiring Notification of Gas Company Representative prior to any work within the Gas Company Easement.
- A Caution Note to be placed on plans stating, "Caution, High Pressure Gas Line, Do Not Disturb", at each proposed crossing.

- No Change of Grade within Gas Company Easement without Gas Company's approval. No permanent structures within easement without Gas Company approval.
- Horizontal clearance of at least ten (10) feet between High Pressure Gas Facilities and any parallel substructure.

Upon request, at least two (2) working days prior to the start of construction, we will locate and mark our active underground facilities for the contractor at no cost. Please call Underground Service Alert (USA) at (800) 422-4133.

Arrangements for someone to stand-by and observe can be made by calling (760) 243-6503 two working days prior to the start of construction. We would appreciate it if you would place a note on your plans to that effect.

If you have any questions or concerns, please feel free to contact me at (213) 220-9682.

Sincerely,

Carlos Gaeta
Engineer – Transmission Tech Services
cagaeta@semprautilities.com

EXHIBIT 7-A

R/W Work Map

RIGHT OF WAY REQUIREMENT MAP

OK7100	08-SBd-15 PM 14.0/16.4, 08-SBd-215 PM 16.0/17.8	9-11-2011	100:1
EA	DIST-CO-RTE-PM	DATE	SCALE

I-15/I-215 INTERCHANGE IMPROVEMENTS, DEVORE — PROJECT DESCRIPTION

OF SHEET

SUBMITTED: JASON COLLADO
PROJECT ENGINEER

CONCURRED: PATRICK HALLY
FUNCTIONAL SUPERVISOR

APPROVED: JESUS PAEZ
DESIGN MANAGER — DATE

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

856+65.52 "B1"
117.34' LT

856+65.51 "B1"
92.00' LT

EXIST. R/W

10'

R/W

869+47.61 "B1"
137.58' LT

TCE

TCE

50:1

'B1' LINE

N47°09'50" W
6429.17' (B1)

855+00 860+00 865+00 870+00 875+00

B1' LINE

FUT LANE

EXIST. R/W

MATCH SHEET RW-2

THIS PLAN ACCURATE FOR RIGHT OF WAY REQUIREMENT MAP ONLY.

RW-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
DESIGN
FUNCTIONAL SUPERVISOR: PATRICK HALLY
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 01-04-12
DATE PLOTTED => 26-MAR-2012
TIME PLOTTED => 13:51

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => s110896
DGN FILE => 0K710rw001.dgn

CU 082245

EA 0K7100

RIGHT OF WAY REQUIREMENT MAP

OK7100	08-SBd-15 PM 14.0/16.4, 08-SBd-215 PM 16.0/17.8	9-11-2011	100:1
EA	DIST-CO-RTE-PM	DATE	SCALE

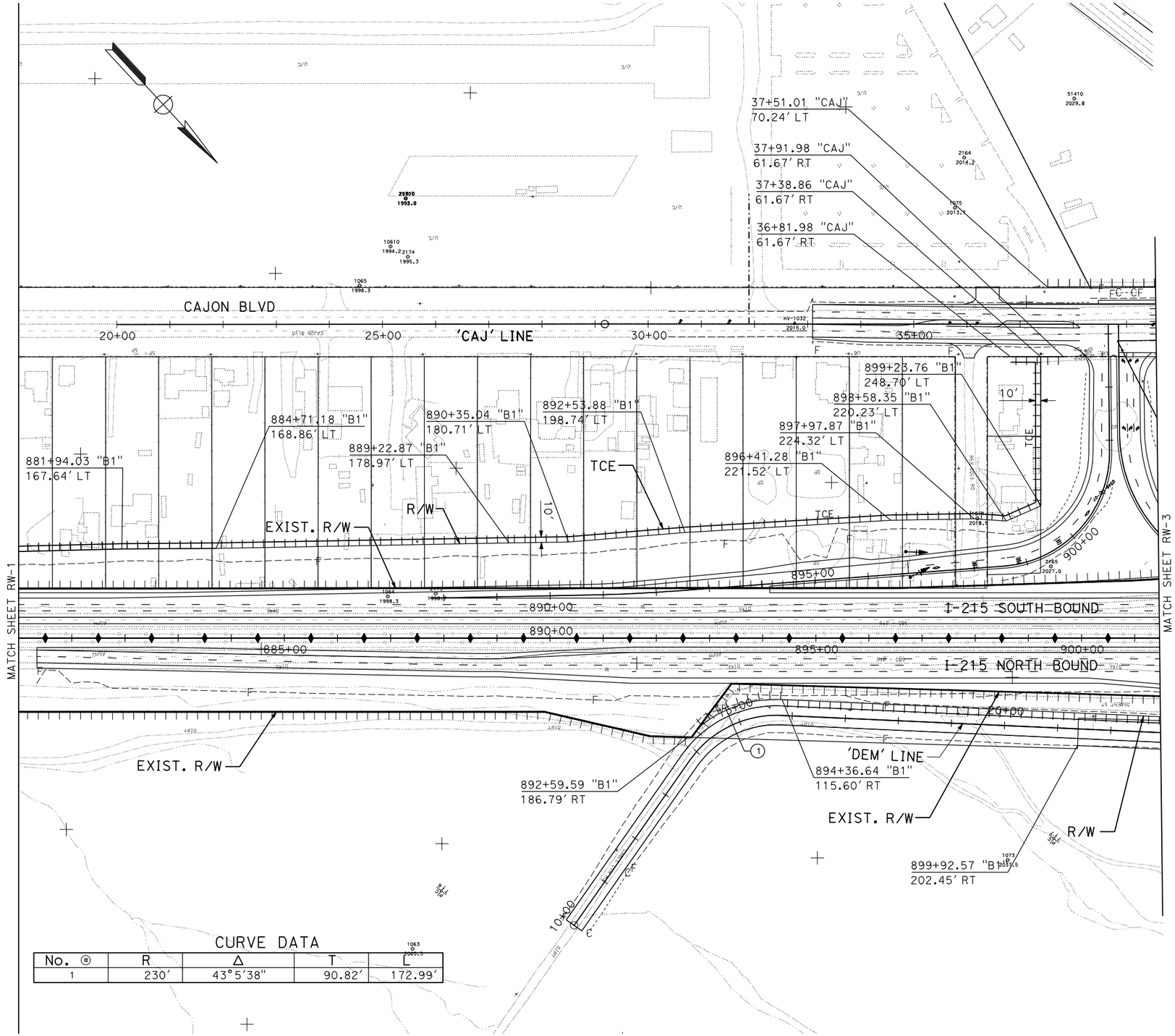
I-15/I-215 INTERCHANGE IMPROVEMENTS, DEVORE — PROJECT DESCRIPTION — OF SHEET

SUBMITTED: JASON COLLADO
PROJECT ENGINEER

CONCURRED: PATRICK HALLY
FUNCTIONAL SUPERVISOR

APPROVED: JESUS PAEZ
DESIGN MANAGER — DATE

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



CURVE DATA

No. ⓗ	R	Δ	T	L
1	230′	43°5′38"	90.82′	172.99′

THIS PLAN ACCURATE FOR RIGHT OF WAY REQUIREMENT MAP ONLY.

RW-2

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — DESIGN
FUNCTIONAL SUPERVISOR — PATRICK HALLY
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED
LAST REVISION 01-04-12
DATE PLOTTED => 26-MAR-2012
TIME PLOTTED => 13:54

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s110896 DGN FILE => OK710rw002.dgn | CU 082245 | EA 0K7100

RIGHT OF WAY REQUIREMENT MAP

MATCH SHEET RW-10

OK7100	08-SBd-15 PM 14.0/16.4, 08-SBd-215 PM 16.0/17.8	9-11-2011	100:1
EA	DIST-CO-RTE-PM	DATE	SCALE

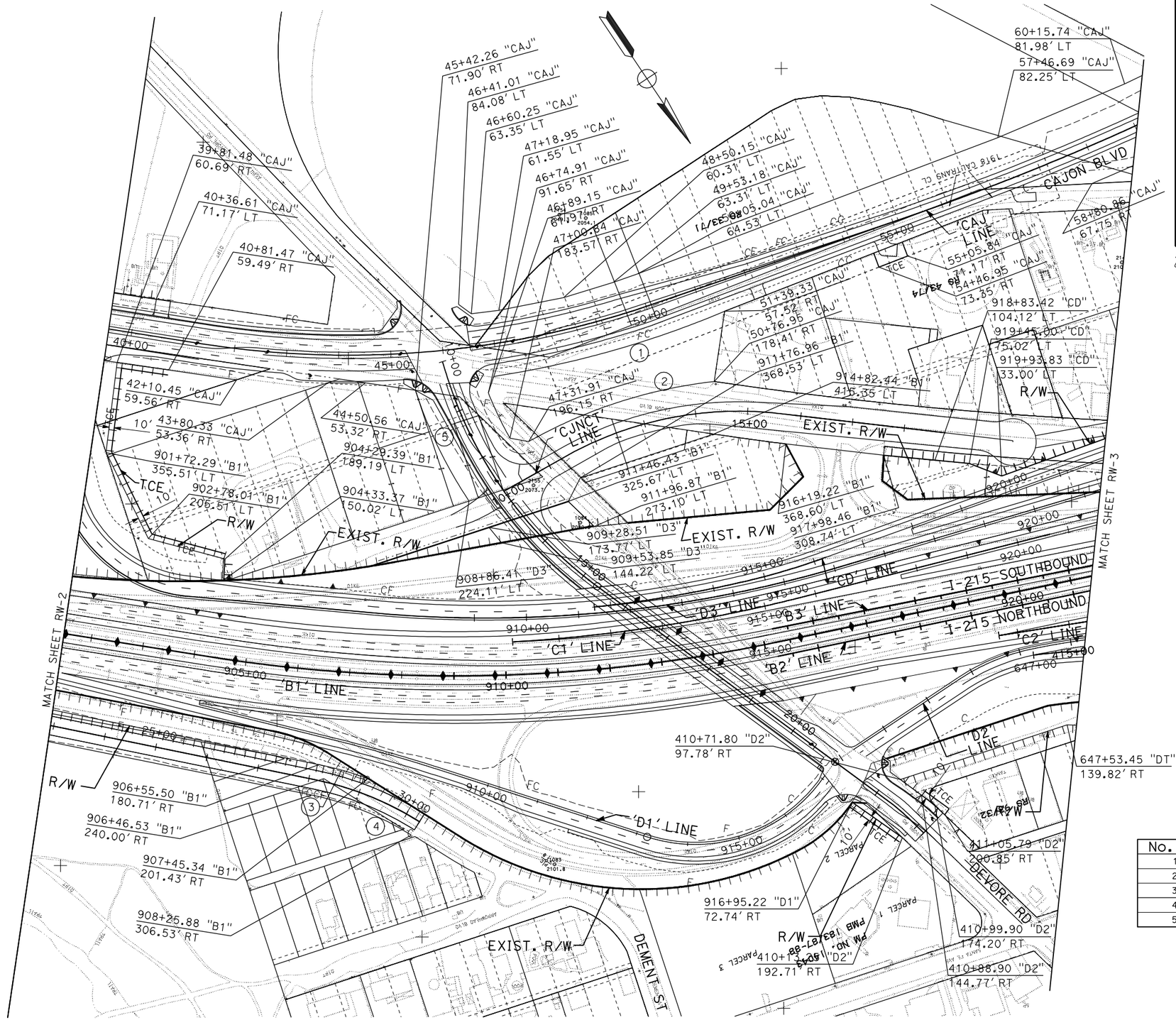
I-15/I-215 INTERCHANGE IMPROVEMENTS, DEVORE — PROJECT DESCRIPTION — OF SHEET

SUBMITTED: JASON COLLADO
PROJECT ENGINEER

CONCURRED: PATRICK HALLY
FUNCTIONAL SUPERVISOR

APPROVED: JESUS PAEZ
DESIGN MANAGER — DATE

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



THIS PLAN ACCURATE FOR RIGHT OF WAY REQUIREMENT MAP ONLY.

CURVE DATA

No. ⑭	R	Δ	T	L
1	1866′	14°10′03"	231.87′	461.38′
2	940′	22°58′19"	191.00′	376.88′
3	630′	8°54′06"	49.04′	97.88′
4	570′	20°52′31"	105.00′	207.68′
5	866′	15°41′19"	119.31′	237.13′

RW-2A

REVISED BY | DATE REVISED
CALCULATED-DESIGNED BY | CHECKED BY
FUNCTIONAL SUPERVISOR: PATRICK HALLY
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — DESIGN
Caltrans

LAST REVISION: DATE PLOTTED => 26-MAR-2012; TIME PLOTTED => 13:56
01-04-12

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s110896; DGN FILE => 0K710rw002A.dgn | CU 082245 | EA 0K7100

RIGHT OF WAY REQUIREMENT MAP

EA	DIST-CO-RTE-PM	DATE	SCALE
0K7100	08-SBd-15 PM 14.0/16.4, 08-SBd-215 PM 16.0/17.8	9-11-2011	100:1

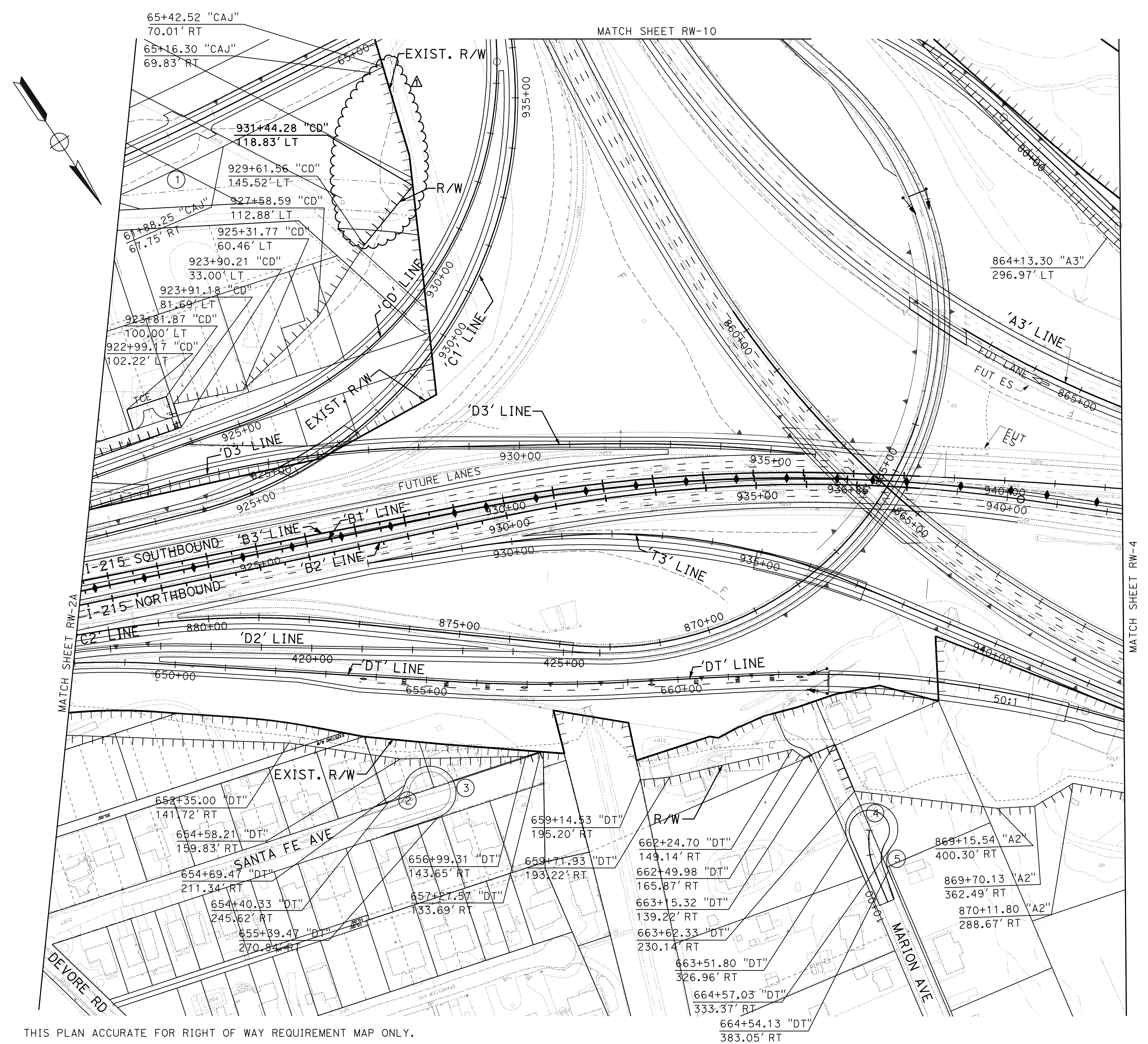
PROJECT DESCRIPTION	SHEET
I-15/I-215 INTERCHANGE IMPROVEMENTS, DEVORE	OF

SUBMITTED: JASON COLLADO
PROJECT ENGINEER

CONCURRED: PATRICK HALLY
FUNCTIONAL SUPERVISOR

APPROVED: JESUS PAEZ
DESIGN MANAGER — DATE

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



THIS PLAN ACCURATE FOR RIGHT OF WAY REQUIREMENT MAP ONLY.

Δ	REVISION	DATE
1	ADJUSTING PROPOSED RIGHT OF WAY	03-22-12

CURVE DATA

No.	R	Δ	T	L
1	5188'	3°26'24"	155.78'	311.46'
2	48'	55°54'02"	25.47'	46.83'
3	52'	235°53'42"	98.01'	214.09'
4	52'	242°30'33"	85.68'	220.09'
5	48'	62°25'21"	29.08'	52.30'

RW-3

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

FUNCTIONAL SUPERVISOR: PATRICK HALLY
CALCULATED-DESIGNED BY / CHECKED BY
REVISED BY / DATE REVISED
DESIGN

LAST REVISION 01-04-12 | DATE PLOTTED => 26-MAR-2012 | TIME PLOTTED => 13:57

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s110896 DGN FILE => 0K710rw003.dgn | CU 082245 | EA 0K7100

RIGHT OF WAY REQUIREMENT MAP

OK7100	08-SBd-15 PM 14.0/16.4, 08-SBd-215 PM 16.0/17.8	9-11-2011	100:1
EA	DIST-CO-RTE-PM	DATE	SCALE

I-15/I-215 INTERCHANGE IMPROVEMENTS, DEVORE — PROJECT DESCRIPTION

OF SHEET

SUBMITTED: JASON COLLADO
PROJECT ENGINEER

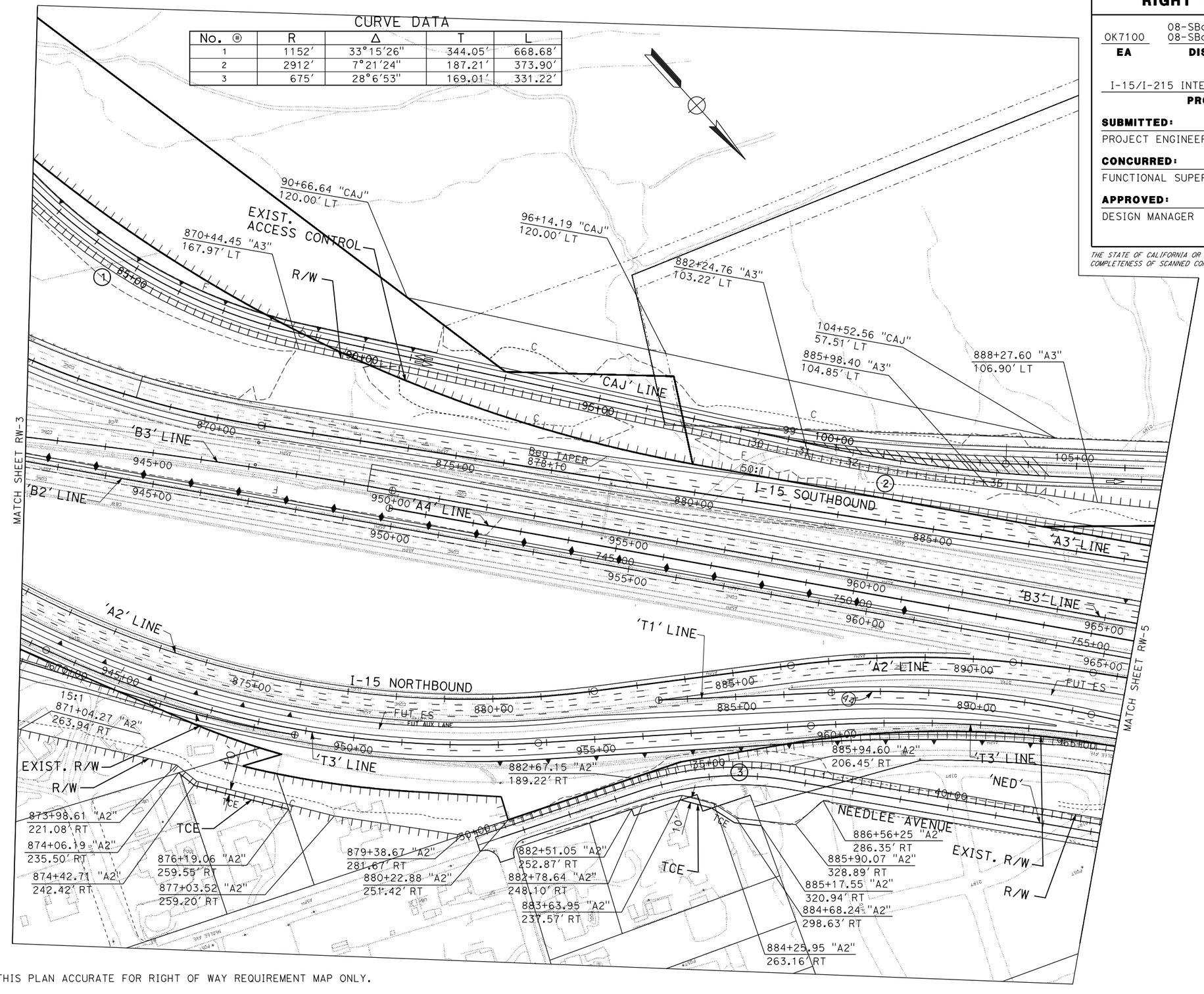
CONCURRED: PATRICK HALLY
FUNCTIONAL SUPERVISOR

APPROVED: JESUS PAEZ
DESIGN MANAGER — DATE

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

CURVE DATA

No.	R	Δ	T	L
1	1152′	33°15′26"	344.05′	668.68′
2	2912′	7°21′24"	187.21′	373.90′
3	675′	28°6′53"	169.01′	331.22′



THIS PLAN ACCURATE FOR RIGHT OF WAY REQUIREMENT MAP ONLY.

RW-4

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans®
DESIGN
FUNCTIONAL SUPERVISOR: PATRICK HALLY
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 01-04-12
DATE PLOTTED => 26-MAR-2012
TIME PLOTTED => 13:58

BORDER LAST REVISED 4/11/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => s110896
DGN FILE => 0K710rw004.dgn
CU 082245
EA 0K7100

RIGHT OF WAY REQUIREMENT MAP

OK7100	08-SBd-15 PM 14.0/16.4, 08-SBd-215 PM 16.0/17.8	9-11-2011	100:1
EA	DIST-CO-RTE-PM	DATE	SCALE

I-15/I-215 INTERCHANGE IMPROVEMENTS, DEVORE — PROJECT DESCRIPTION

OF SHEET

SUBMITTED: JASON COLLADO
PROJECT ENGINEER

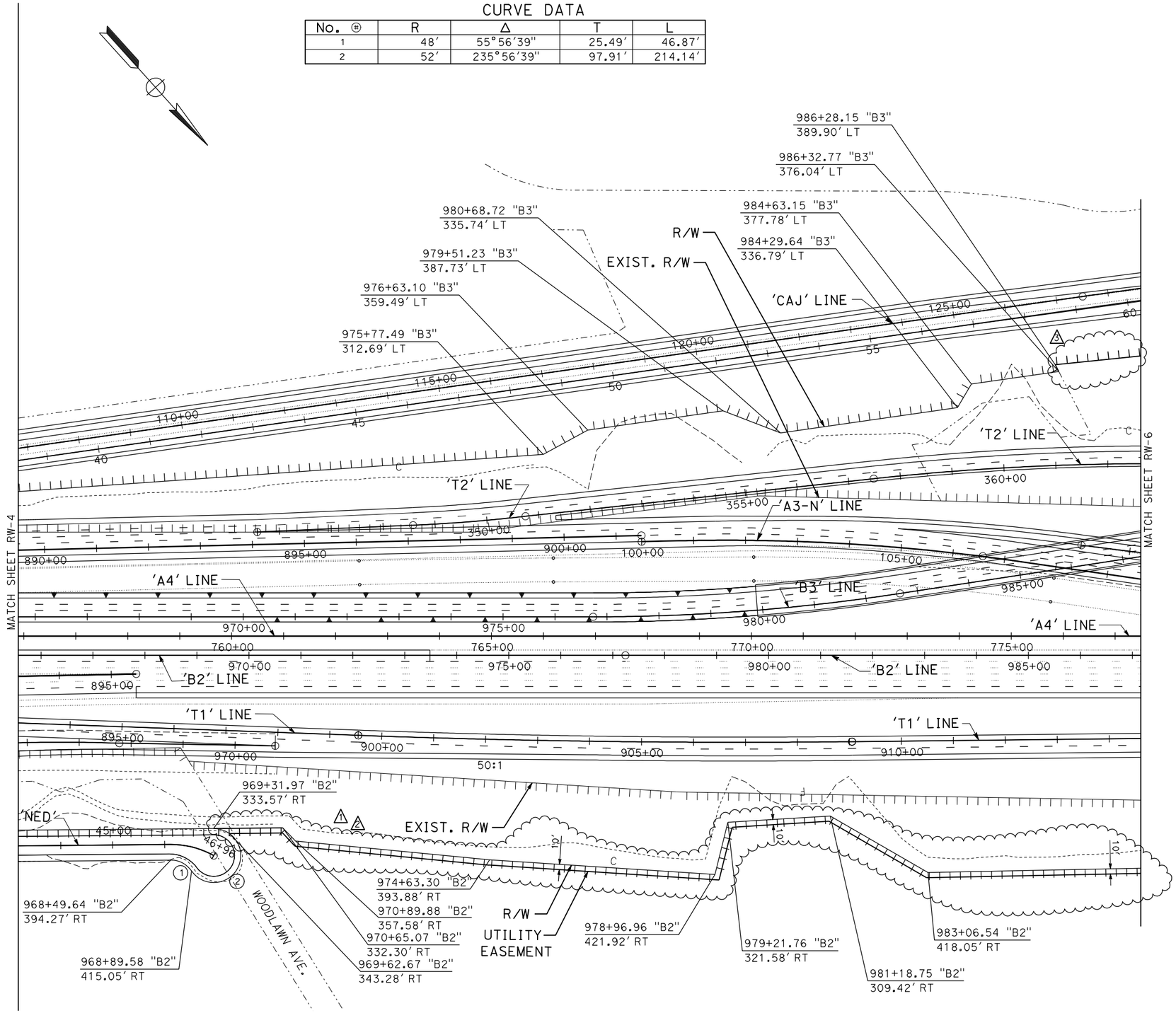
CONCURRED: PATRICK HALLY
FUNCTIONAL SUPERVISOR

APPROVED: JESUS PAEZ
DESIGN MANAGER — DATE

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

CURVE DATA

No. ⑪	R	Δ	T	L
1	48′	55°56′39"	25.49′	46.87′
2	52′	235°56′39"	97.91′	214.14′



Δ	REVISION	DATE
1	ADDING 20′ UTILITY EASEMENT	02-08-12
2	REDUCE TO 10′ UTILITY EASEMENT	02-23-12
3	UTILITY ADJUSTMENT	03-26-12

THIS PLAN ACCURATE FOR RIGHT OF WAY REQUIREMENT MAP ONLY.

RW-5

LAST REVISION 01-04-12 | DATE PLOTTED => 26-MAR-2012 | TIME PLOTTED => 14:00

REVISED BY | DATE REVISED
CALCULATED-DESIGNED BY | CHECKED BY
FUNCTIONAL SUPERVISOR: PATRICK HALLY
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION | DESIGN

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s110896 | DGN FILE => 0K710rw005.dgn | CU 082245 | EA 0K7100

RIGHT OF WAY REQUIREMENT MAP

OK7100	08-SBd-15 PM 14.0/16.4, 08-SBd-215 PM 16.0/17.8	9-11-2011	100:1
EA	DIST-CO-RTE-PM	DATE	SCALE

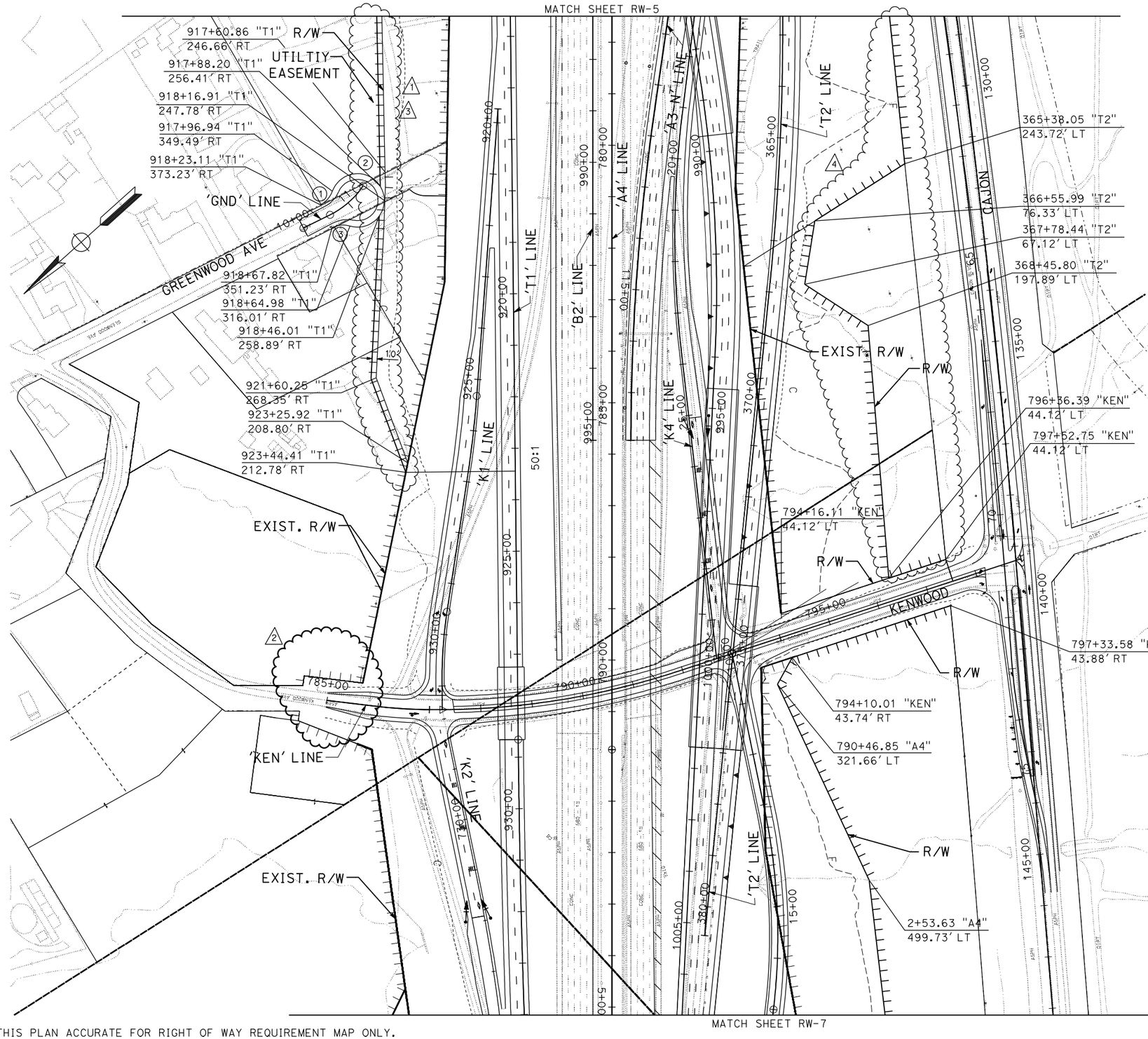
I-15/I-215 INTERCHANGE IMPROVEMENTS, DEVORE — PROJECT DESCRIPTION — OF SHEET

SUBMITTED: JASON COLLADO
PROJECT ENGINEER

CONCURRED: PATRICK HALLY
FUNCTIONAL SUPERVISOR

APPROVED: JESUS PAEZ
DESIGN MANAGER — DATE

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



Δ	REVISION	DATE
1	ADDING 20' UTILITY EASEMENT	02-08-12
2	RE-DESIGN KENWOOD START AT STA 785+00	02-08-12
3	REDUCE TO 10' UTILITY EASEMENT	02-23-12
4	UTILITY ADJUSTMENT	03-26-12

CURVE DATA

No. ℗	R	Δ	T	L
1	48'	43°11'31"	19.00'	36.18'
2	52'	266°22'06"	55.41'	241.75'
3	48'	43°11'31"	19.00'	36.18'

THIS PLAN ACCURATE FOR RIGHT OF WAY REQUIREMENT MAP ONLY.

RW-6

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

FUNCTIONAL SUPERVISOR: PATRICK HALLY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — DESIGN

LAST REVISION 01-04-12 — DATE PLOTTED => 26-MAR-2012 — TIME PLOTTED => 14:01

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s110896 | DGN FILE => 0K710rw006.dgn | CU 082245 | EA 0K7100

RIGHT OF WAY REQUIREMENT MAP

OK7100	08-SBd-15 PM 14.0/16.4, 08-SBd-215 PM 16.0/17.8	9-11-2011	100:1
EA	DIST-CO-RTE-PM	DATE	SCALE

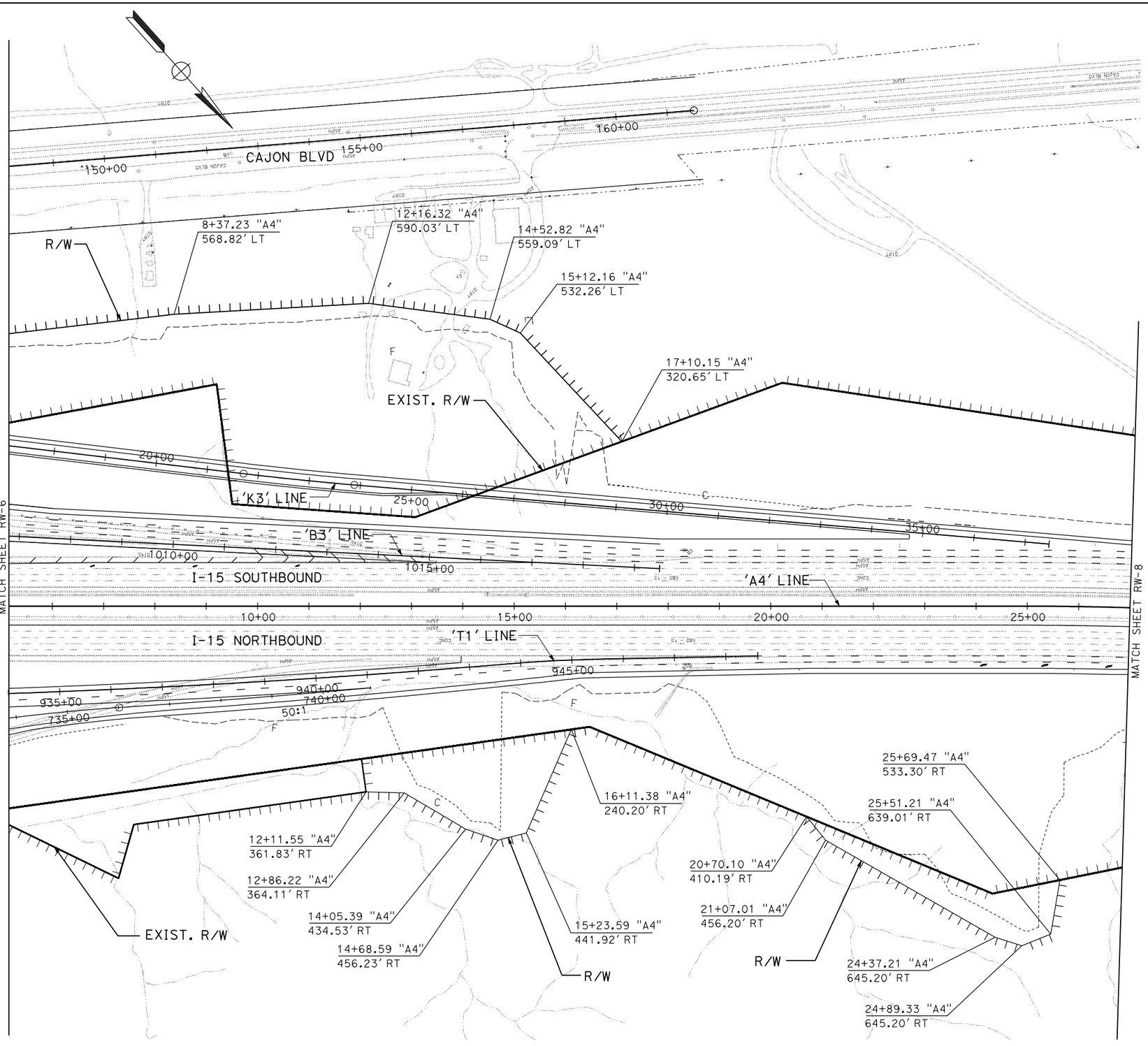
I-15/I-215 INTERCHANGE IMPROVEMENTS, DEVORE — PROJECT DESCRIPTION — OF SHEET

SUBMITTED: JASON COLLADO
PROJECT ENGINEER

CONCURRED: PATRICK HALLY
FUNCTIONAL SUPERVISOR

APPROVED: JESUS PAEZ
DESIGN MANAGER — DATE

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



THIS PLAN ACCURATE FOR RIGHT OF WAY REQUIREMENT MAP ONLY.

RW-7

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — DESIGN — CALCULATED-DESIGNED BY — CHECKED BY — FUNCTIONAL SUPERVISOR — PATRICK HALLY — REVISED BY — DATE REVISED

LAST REVISION 01-04-12 — DATE PLOTTED => 26-MAR-2012 — TIME PLOTTED => 14:03

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s110896 | DGN FILE => 0K710rw007.dgn | CU 082245 | EA 0K7100

RIGHT OF WAY REQUIREMENT MAP

OK7100	08-SBd-15 PM 14.0/16.4, 08-SBd-215 PM 16.0/17.8	9-11-2011	100:1
EA	DIST-CO-RTE-PM	DATE	SCALE

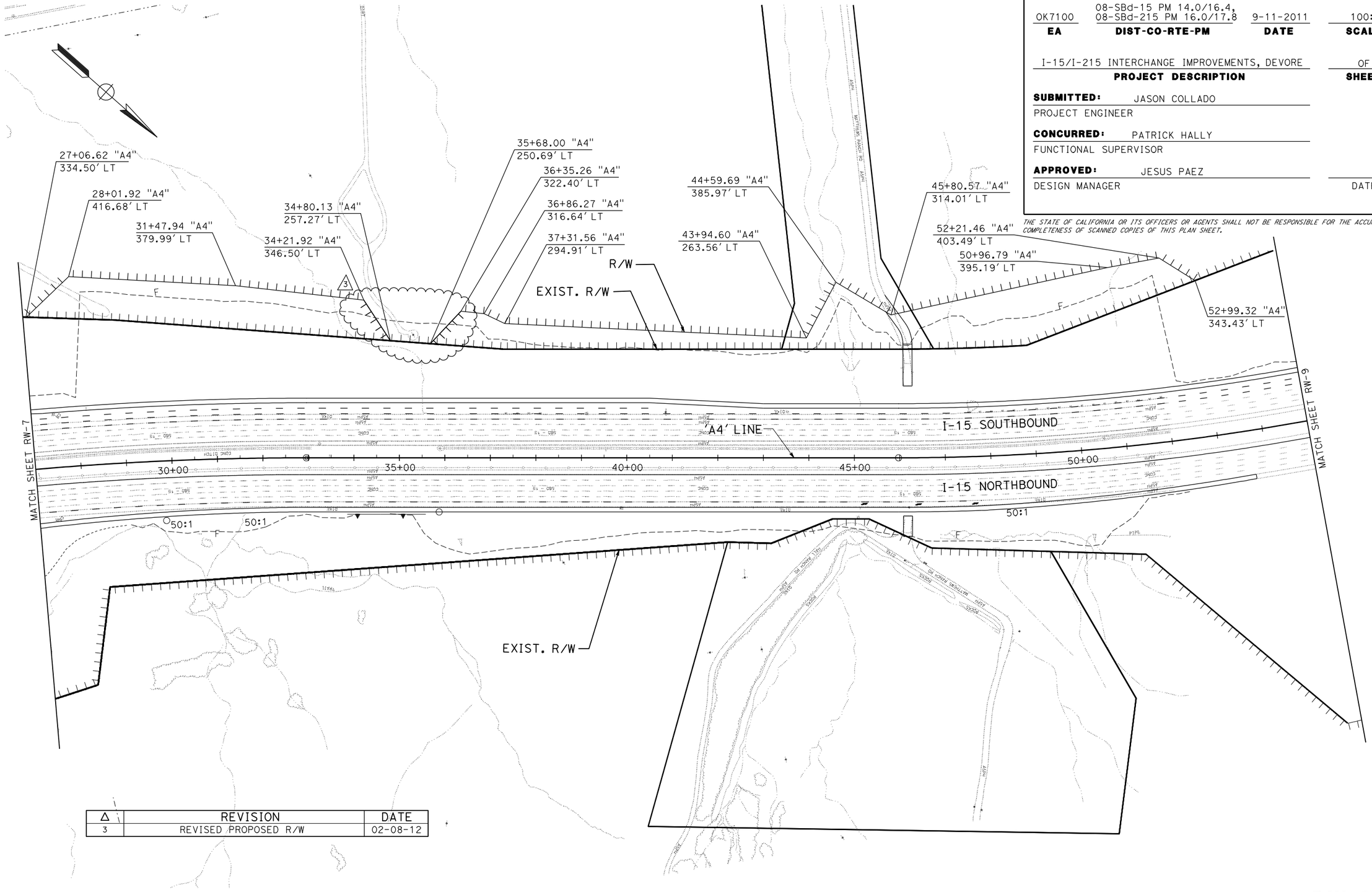
I-15/I-215 INTERCHANGE IMPROVEMENTS, DEVORE — PROJECT DESCRIPTION — OF SHEET

SUBMITTED: JASON COLLADO
PROJECT ENGINEER

CONCURRED: PATRICK HALLY
FUNCTIONAL SUPERVISOR

APPROVED: JESUS PAEZ
DESIGN MANAGER — DATE

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



Δ	REVISION	DATE
3	REVISED PROPOSED R/W	02-08-12

THIS PLAN ACCURATE FOR RIGHT OF WAY REQUIREMENT MAP ONLY.

RW-8

REVISED BY | DATE REVISED
CALCULATED-DESIGNED BY | CHECKED BY
FUNCTIONAL SUPERVISOR: PATRICK HALLY
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION | DESIGN

LAST REVISION 01-04-12 | DATE PLOTTED => 26-MAR-2012 | TIME PLOTTED => 14:06

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s110896 | DGN FILE => 0K710rw008.dgn | CU 082245 | EA 0K7100

RIGHT OF WAY REQUIREMENT MAP

OK7100	08-SBd-15 PM 14.0/16.4, 08-SBd-215 PM 16.0/17.8	9-11-2011	100:1
EA	**DIST-CO-RTE-PM**	**DATE**	**SCALE**

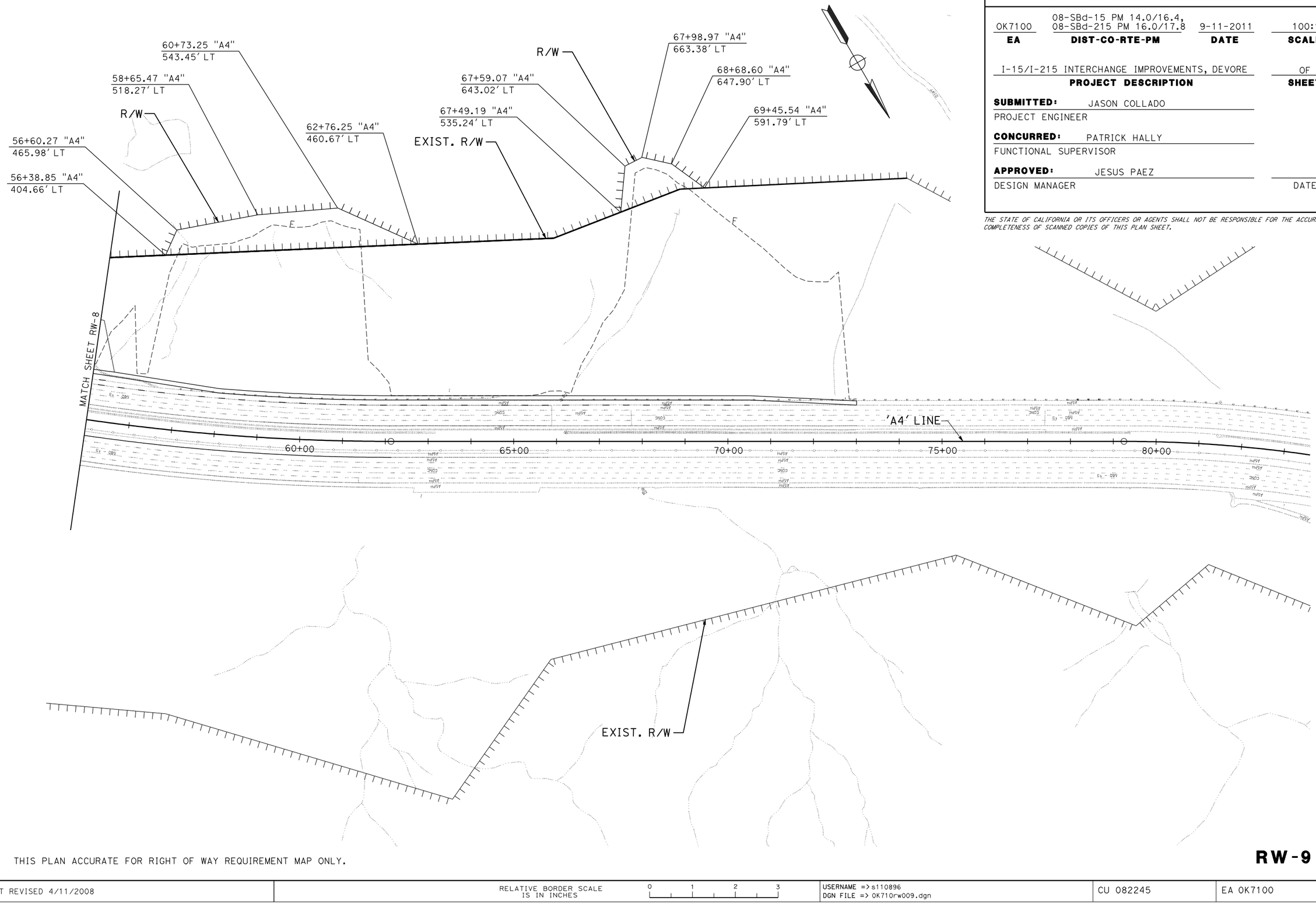
I-15/I-215 INTERCHANGE IMPROVEMENTS, DEVORE — **PROJECT DESCRIPTION** — OF **SHEET**

SUBMITTED: JASON COLLADO
PROJECT ENGINEER

CONCURRED: PATRICK HALLY
FUNCTIONAL SUPERVISOR

APPROVED: JESUS PAEZ
DESIGN MANAGER — DATE

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



THIS PLAN ACCURATE FOR RIGHT OF WAY REQUIREMENT MAP ONLY.

RW-9

REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY
CHECKED BY
FUNCTIONAL SUPERVISOR: PATRICK HALLY
DESIGN

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans®

LAST REVISION 01-04-12
DATE PLOTTED => 26-MAR-2012
TIME PLOTTED => 14:08

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s110896 DGN FILE => OK710rw009.dgn | CU 082245 | EA OK7100

RIGHT OF WAY REQUIREMENT MAP

OK7100	08-SBd-15 PM 14.0/16.4, 08-SBd-215 PM 16.0/17.8	9-11-2011	100:1
EA	DIST-CO-RTE-PM	DATE	SCALE

I-15/I-215 INTERCHANGE IMPROVEMENTS, DEVORE — PROJECT DESCRIPTION — OF SHEET

SUBMITTED: JASON COLLADO
PROJECT ENGINEER

CONCURRED: PATRICK HALLY
FUNCTIONAL SUPERVISOR

APPROVED: JESUS PAEZ
DESIGN MANAGER — DATE

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

EXIST. R/W

EXIST. R/W

835+00 I-15 SOUTHBOUND

835+00 I-15 NORTHBOUND

840+00

840+00

840+00

FREEWAY EASEMENT

FUTURE BR WIDEN

'A1' LINE

'A2' LINE

'A3' LINE

'C1' LINE

'C2' LINE

845+00

845+00

845+00

850+00

850+00

850+00

850+00

70+00

75+00

EXIST. R/W

850+69.59 "A2"
344.72' RT

R/W

EXIST. R/W

854+17.19 "A3"
380.51' RT

R/W

THIS PLAN ACCURATE FOR RIGHT OF WAY REQUIREMENT MAP ONLY.

MATCH SHEET RW-3

RW-10

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

FUNCTIONAL SUPERVISOR: PATRICK HALLY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans® DESIGN

LAST REVISION 01-04-12 | DATE PLOTTED => 26-MAR-2012 | TIME PLOTTED => 14:11

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => s110896 | DGN FILE => 0K710rw010.dgn | CU 082245 | EA 0K7100

EXHIBIT 7-B

D8 R/W Requirements Map Guidelines

District 8: Right-of-Way (R/W) Requirement Map Guidelines

R/W Requirement maps shall be prepared and provided to R/W Engineering per the following referenced mandates and specifications:

- R/W Manual, Chapter 6, Section 6.03, Boundary Determination and R/W Requirements.
- Project Development Procedures Manual, Chapter 14 - Preparation of Project Plans: Section 1, Article 4, and Section 2, Article 2.

The maps will include the following:

1.) Signature / Date Block:
No original, transmitted set of R/W requirement maps will be regarded as complete and ready for use without a signature block, complete with wet-signed and dated signatures from the Deputy District Director (DDD) of Design, or Caltrans project oversight, and the design senior, or registered civil engineer in responsible charge for the project. In addition, the R/W Project Delivery Manager will sign all revised requirement maps being submitted.

2.) Alignments, Proposed / Existing, etc.:
Alignment control will be provided by Surveys upon request and any new alignment lines shall be based upon such control. All alignment lines (i.e., stationed lines of improvement, stationed lines of construction, layout lines, street centerlines, or any other lines used to control the layout of the project) shall have stationing delineated per said control. Said alignments shall be delineated to show name designation, and equation values, such that all alignments shown on the requirement map can be mathematically related to each other.

3.) Stations and Offsets (Call-outs):
Stations and offsets based upon an identified alignment shall be shown for all new R/W angle points for both fee and easement parcels. The callouts should be based upon right of way lines developed with the assistance of the R/W Engineering department. Preferred R/W engineering practices, including the use of minimal angle points and tangent curves, should be followed (see note after item no. 8).

4.) Slope limits:
Slope limit lines shall be delineated, complete with cut ("C") and fill ("F") segments identified. Said limits shall be accurately plotted to show any required slope easements. Electronic files depicting slope limits shall be provided to the R/W Engineering department.

5.) Existing & Proposed (R/W):
All existing R/W lines within the project limits shall be shown and labeled as **"existing R/W"**. All proposed R/W lines shall be clearly shown and labeled as **"R/W"**.

6.) Required Ownership Interests:
Fee ownership will be assumed for required areas unless specified otherwise. All other interests (TCE - temporary construction easements, slope easements, etc.) need to be specified. The expiration of the TCE should be shown. The purpose for all public utility easements (e.g. drainage lines, power lines, soil nail, etc.) should be stated.

7.) Access Control / Access Openings

Call-outs shall be used to label the beginning and end of access control limits. Access opening locations shall be labeled with widths and / or call-outs.

8.) Grid Reminder:

Unless otherwise specified, the dimensions on the R/W requirement map are assumed to be on the State plane / grid system and will be used as such on R/W Engineering mapping.

NOTE:

Preferred R/W engineering practice avoids the following:

- Non-tangent curves;
- Angle points on property lines or section lines unless agreed upon by R/W Engineering (Sometimes it is desirable to terminate new R/W at a property line);
- Sliver takes;
- Multiple, consecutive short tangents.

As early as possible in the R/W Requirement development process, a meeting should be held between the affected R/W Engineering and Design department personnel.

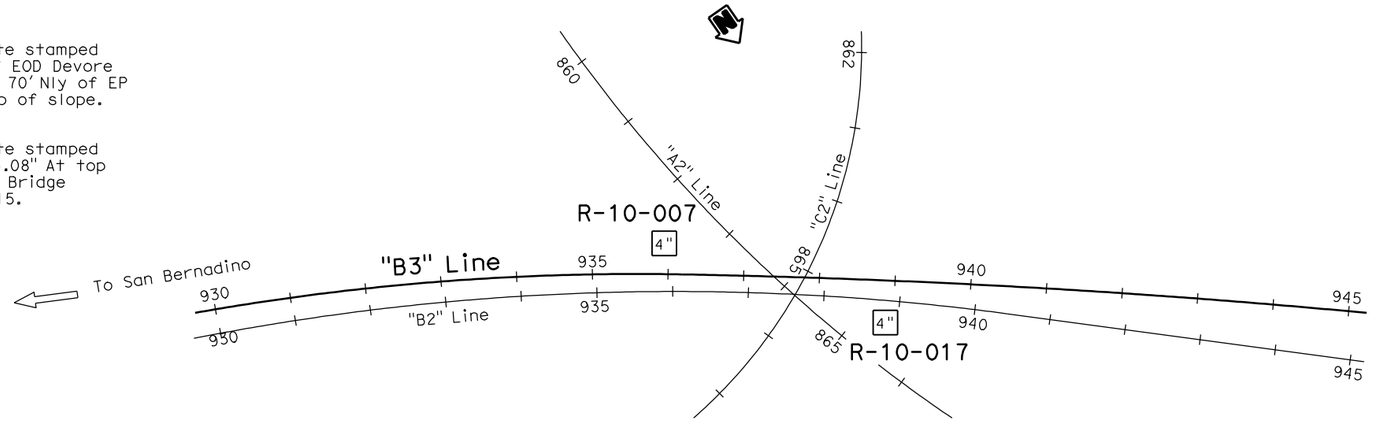
EXHIBIT 8-A

Log of Test Borings

BENCH MARK

PNO 173 2120.910
FD STD Brass disk in concrete stamped "SBD-215-173 1988" 40′ Ely of EOD Devore Rd Bridge at Nly end bridge; 70′ Nly of EP NB SBD 215 at PM 17.3 at top of slope.

PNO 2010 2179.090
FD STD Brass disk in concrete stamped "D8 SCN SBD-15 PM 16.3 08.04.08" At top of slope SOUTH of Connector Bridge from NB SBD 15 to NB SBD 215.



PLAN
1" = 100′

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

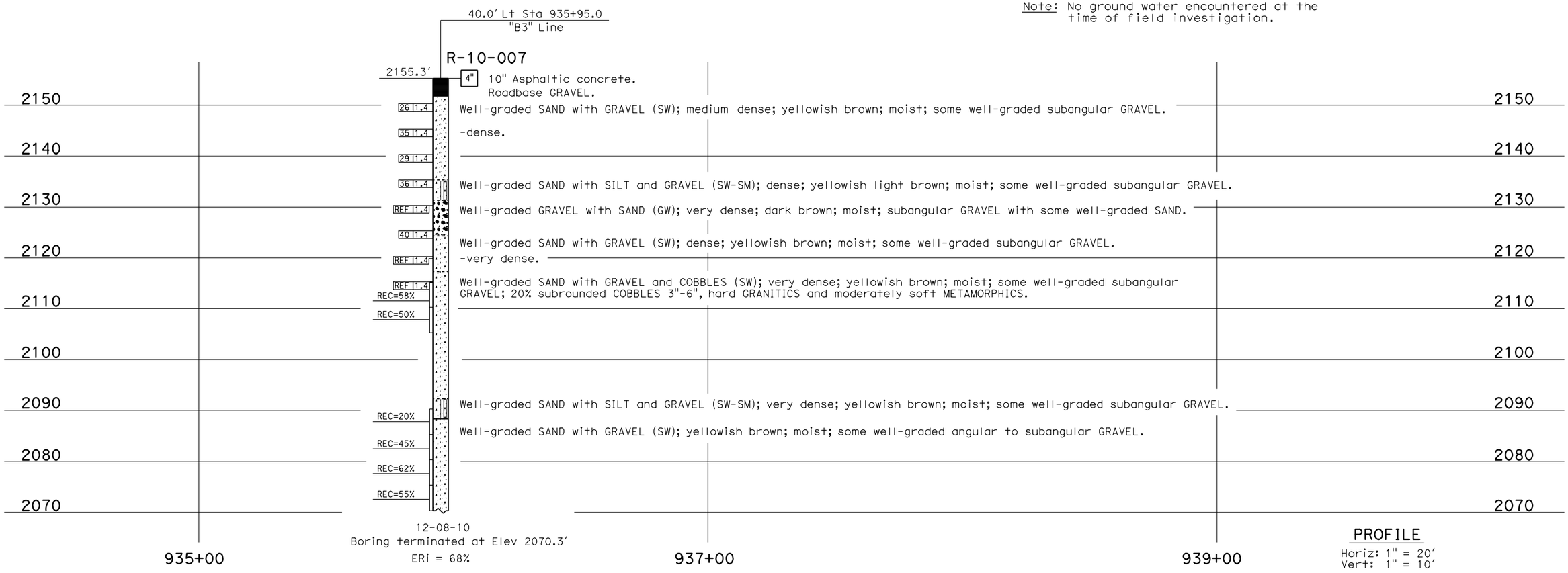
PROFESSIONAL GEOLOGIST — K. Douglas Cook No. 1391 Exp. 12-31-11 CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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.

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

Note: No ground water encountered at the time of field investigation.



PROFILE
Horiz: 1" = 20′
Vert: 1" = 10′

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	15/215 SEPARATION (WIDEN)
FUNCTIONAL SUPERVISOR	DRAWN BY: F. Nguyen 6/11		DESIGN BRANCH X	54-0783R	
NAME: A. Perez-Cobo	CHECKED BY: B. Levine/S. Logeswaran	FIELD INVESTIGATION BY: D. Cook		POST MILE 17.32	LOG OF TEST BORINGS 1 OF 6

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
09-21-11	10-03-11			X	X

FILE => 15-215sep1of6.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 13:27

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

56.0' Rt Sta 938+90.0
"B3" Line

R-10-017

2161.6'

FOR PLAN VIEW, SEE
"LOG OF TEST BORINGS 1 OF 6"

Note: No ground water encountered at the time of field investigation.

Well-graded SAND with SILT and GRAVEL (SW-SM); medium dense; yellowish light brown; moist; some subangular fine GRAVEL.

Well-graded GRAVEL with SAND and COBBLES (GW); dense; yellowish brown; moist; mostly well-graded subangular GRAVEL; some well-graded SAND; 10% subrounded COBBLES 3"-6" GRANITICS and METAMORPHICS; hard.

Well-graded SAND with GRAVEL and COBBLES (SW); medium dense; yellowish light brown; moist; some well-graded subangular GRAVEL.

-little fine subangular GRAVEL.

-very dense; some well-graded subangular GRAVEL.

Well-graded GRAVEL with SAND and COBBLES (GW); very dense; yellowish brown; some well-graded SAND; 15% COBBLES 3"-8" subrounded; hard GRANITICS and METAMORPHICS.

Well-graded SAND with GRAVEL (SW); very dense; yellowish light brown; moist; little well-graded subangular GRAVEL.

-light brown; little subangular fine GRAVEL.

Well-graded GRAVEL with SAND and COBBLES (GW); brown; moist; mostly well-graded subangular GRAVEL; some well-graded SAND; 15% subrounded COBBLES 3"-12" moderately hard GRANITICS and soft METAMORPHICS.

Poorly-graded GRAVEL with SAND (GP); grayish brown; moist; fine subangular GRAVEL; little medium to coarse SAND.

12-08-10
Boring terminated at Elev 2001.6'
ERi = 68%

PROFILE
Horiz: 1" = 20'
Vert: 1" = 10'

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	15/215 SEPARATION (WIDEN)
FUNCTIONAL SUPERVISOR	DRAWN BY: F. Nguyen 6/11	FIELD INVESTIGATION BY:	DESIGN BRANCH X	54-0783R	LOG OF TEST BORINGS 2 OF 6
NAME: A. Perez-Cobo	CHECKED BY: B. Levine/S. Logeswaran	D. Cook		POST MILE 17.32	

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
09-21-11	10-03-11			X	X

FILE => 15-215sep2of6.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 13:27

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

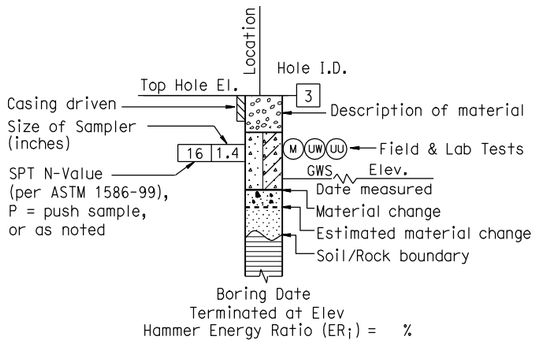
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

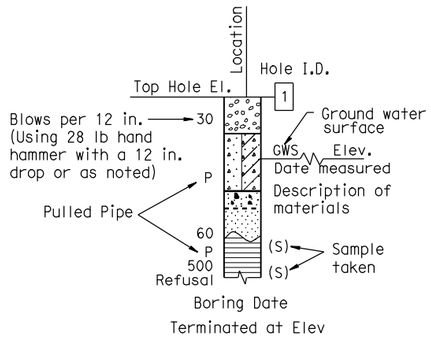
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

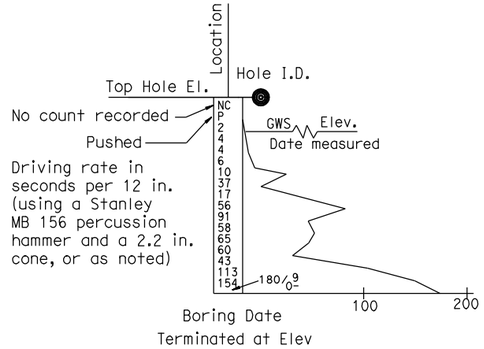
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



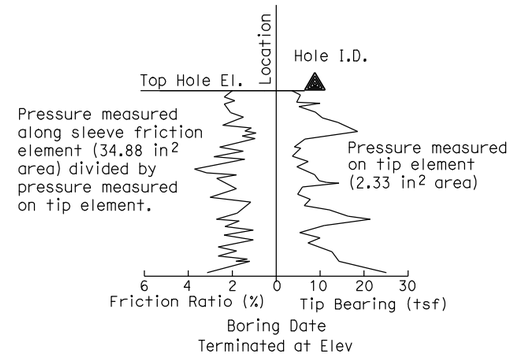
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	15/215 SEPARATION (WIDEN)
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	54-0783R POST MILE 17.32	LOG OF TEST BORINGS 3 OF 6

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
09-21-11				X	X

FILE => 15-215sep3of6.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 13:27

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook No. 1391 Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	15/215 SEPARATION (WIDEN)
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	54-0783R POST MILE 17.32	LOG OF TEST BORINGS 4 OF 6

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

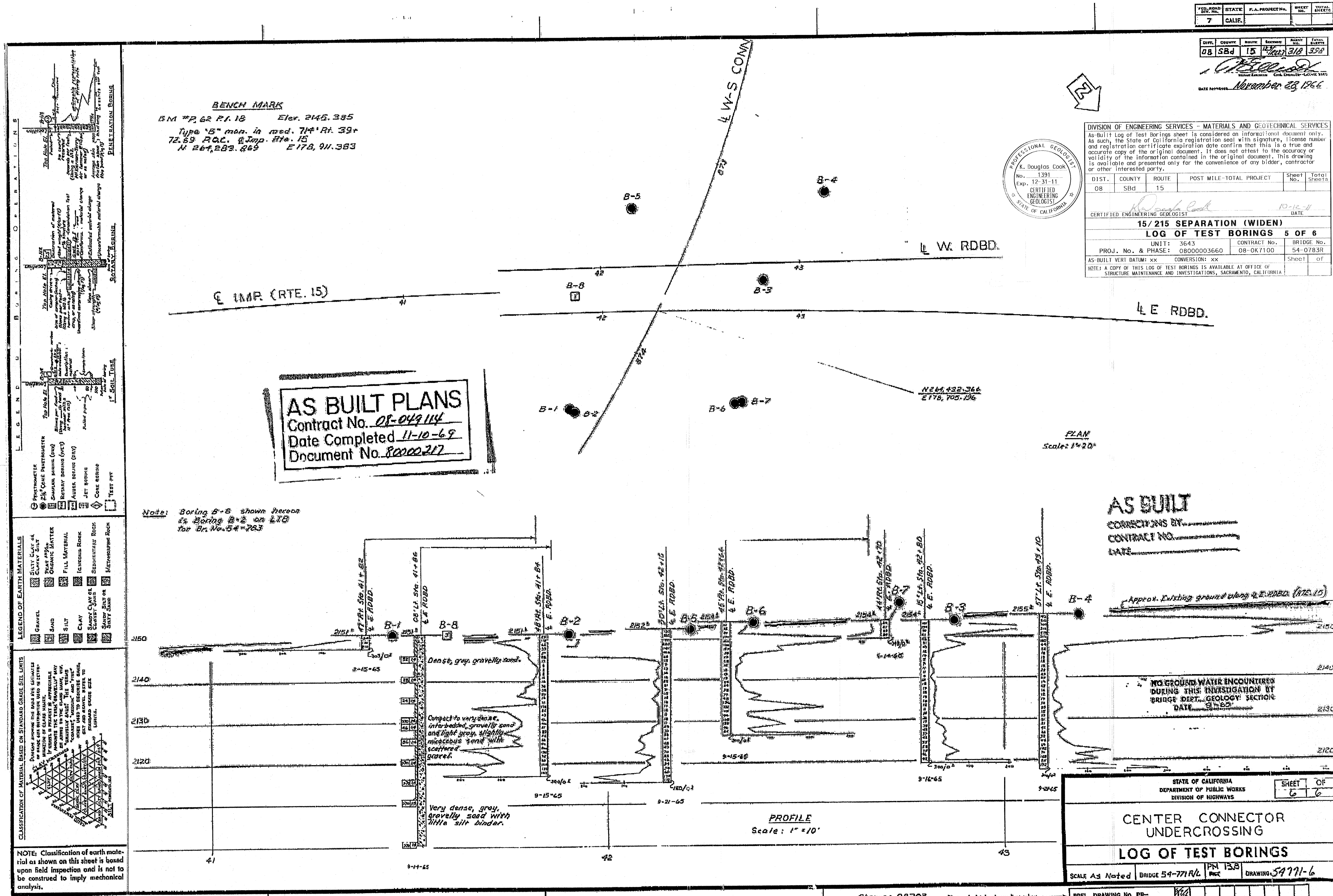
UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

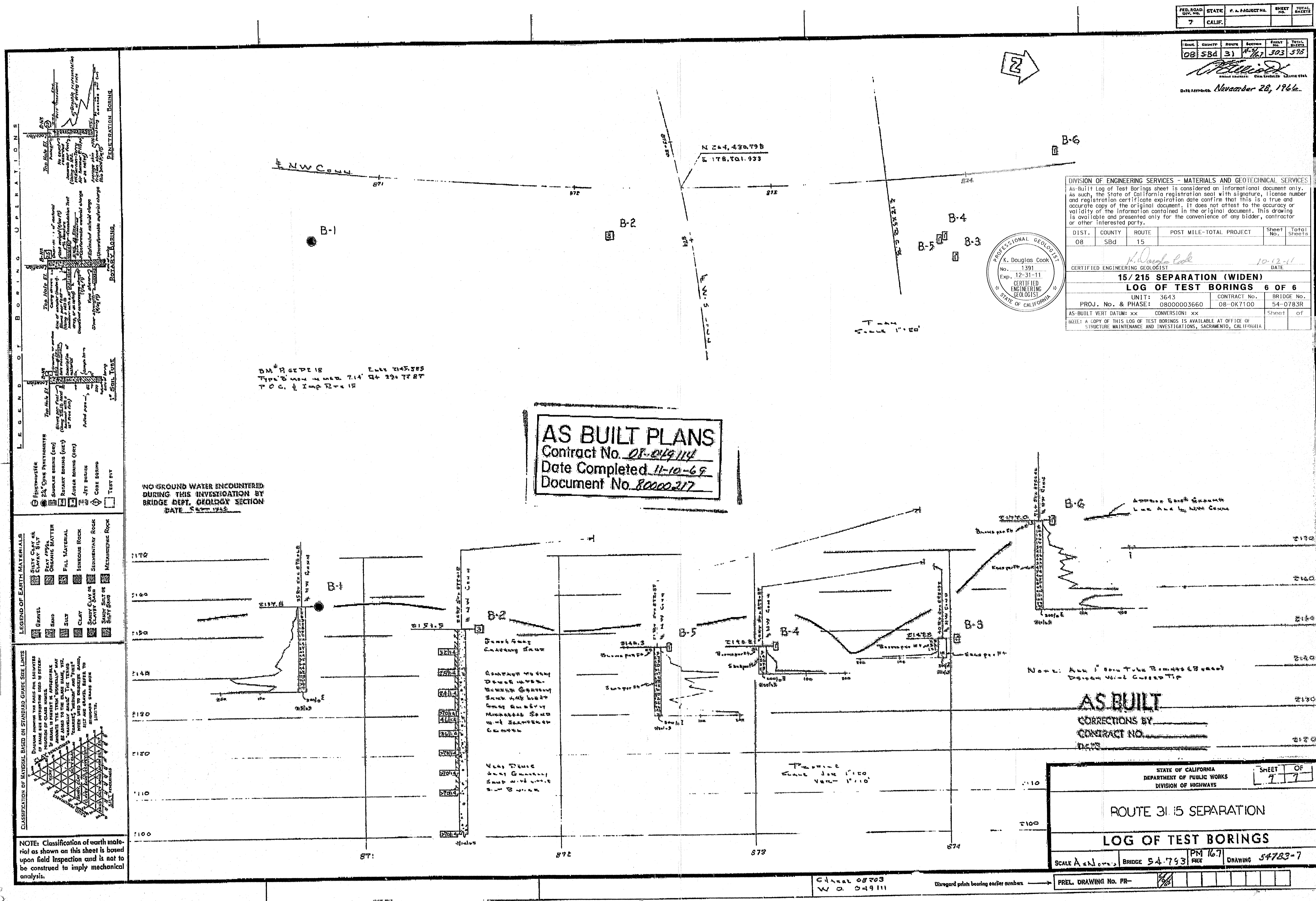
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
09-21-11				X	X

FILE => 15-215sep4of6.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 13:27


FED. ROAD DIV. No. 7 STATE CALIF. F.A. PROJECT No. SHEET No. TOTAL SHEETS
DIST. 08 COUNTY SBd ROUTE 15 SECTION SHEET No. 318 TOTAL SHEETS 338
DATE November 28, 1966
DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES
As-Built Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.
PROFESSIONAL GEOLOGIST K. Douglas Cook No. 1391 Exp. 12-31-11 CERTIFIED ENGINEERING GEOLOGIST STATE OF CALIFORNIA
DIST. 08 COUNTY SBd ROUTE 15 POST MILE-TOTAL PROJECT Sheet No. Total Sheets
CERTIFIED ENGINEERING GEOLOGIST DATE 10-12-11
15/215 SEPARATION (WIDEN)
LOG OF TEST BORINGS 5 OF 6
UNIT: 3643 PROJ. No. & PHASE: 08000003660 CONTRACT No. 08-0K7100 BRIDGE No. 54-0783R
AS-BUILT VERT DATUM: xx CONVERSION: xx Sheet of
NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA
BENCH MARK
BM #P.62 P.I. 18 Elev. 2145.385
Type "B" mon. in med. 714' Rt. 39+72.69 P.O.C. ℄ Imp. Rte. 15
N 264,283.869 E 178,911.363
℄ W-S CONN
℄ W. RDBD.
℄ E RDBD.
℄ IMP. (RTE. 15)
B-1 B-2 B-3 B-4 B-5 B-6 B-7 B-8
N 264,432.366 E 178,705.196
PLAN Scale: 1"=20'
AS BUILT PLANS
Contract No. 08-049114
Date Completed 11-10-69
Document No. 80000217
AS BUILT
CORRECTIONS BY
CONTRACT NO.
DATE
Note: Boring B-8 shown hereon is Boring B-2 on LTB for Br. No. 54-783
Approx. Existing ground along ℄ E. RDBD. (RTE. 15)
Dense, gray, gravelly sand.
Compact to very dense, interbedded, gravelly sand and light gray, slightly micaceous sand with scattered gravel.
Very dense, gray, gravelly sand with little silt binder.
NO GROUND WATER ENCOUNTERED DURING THIS INVESTIGATION BY BRIDGE DEPT., GEOLOGY SECTION DATE 9-65
PROFILE Scale: 1" = 10'
2150 2140 2130 2120
41 42 43
LEGEND OF BORING OPERATIONS
PENETROMETER
2½" CONE PENETROMETER
SAMPLER BORING (DRY)
ROTARY BORING (WET)
AUGER BORING (DRY)
JET BORING
CORE BORING
TEST PIT
1" SOIL TUBE
ROTARY BORING
PENETRATION BORING
LEGEND OF EARTH MATERIALS
GRAVEL SAND SILT CLAY SANDY CLAY OR CLAYEY SAND SANDY SILT OR SILTY SAND SILTY CLAY OR CLAYEY SILT PEAT AND/OR ORGANIC MATTER FILL MATERIAL IGNEOUS ROCK SEDIMENTARY ROCK METAMORPHIC ROCK
CLASSIFICATION OF MATERIAL BASED ON STANDARD GRADE SIZE LIMITS
NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.
BRIDGE DEPARTMENT ENGINEERING GEOLOGY SECTION
STATE OF CALIFORNIA DEPARTMENT OF PUBLIC WORKS DIVISION OF HIGHWAYS
SHEET 6 OF 6
CENTER CONNECTOR UNDERCROSSING
LOG OF TEST BORINGS
SCALE As Noted BRIDGE 54-771 R/L PM 13.8 DRAWING 54771-6
Charge: 08203 WA: 049111
Disregard prints bearing earlier numbers
PREL. DRAWING No. PR-



FED. ROAD DIV. NO. 7 | STATE CALIF. | F. A. PROJECT NO. | SHEET NO. | TOTAL SHEETS
DIST. 08 | COUNTY SBd | ROUTE 31 | SECTION | SHEET NO. 303 | TOTAL SHEETS 398
DATE APPROVED November 28, 1966
DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES
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DIST. 08 | COUNTY SBd | ROUTE 15 | POST MILE-TOTAL PROJECT | Sheet No. | Total Sheets
CERTIFIED ENGINEERING GEOLOGIST
DATE 10-12-11
15/215 SEPARATION (WIDEN)
LOG OF TEST BORINGS 6 OF 6
UNIT: 3643
PROJ. No. & PHASE: 08000003660
CONTRACT No. 08-0K7100
BRIDGE No. 54-0783R
AS-BUILT VERT DATUM: xx CONVERSION: xx
Sheet of
NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA
PROFESSIONAL GEOLOGIST
K. Douglas Cook
No. 1391
Exp. 12-31-11
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA
N 244,430.798
E 178,701.933
B-1
B-2
B-3
B-4
B-5
B-6
871
872
873
874
AS BUILT PLANS
Contract No. 08-049114
Date Completed 11-10-69
Document No. 80000217
NO GROUND WATER ENCOUNTERED DURING THIS INVESTIGATION BY BRIDGE DEPT. GEOLOGY SECTION
LEGEND OF BORING OPERATIONS
PENETRATION BORING
ROTARY BORING
1" SOIL TUBE
LEGEND OF EARTH MATERIALS
GRAVEL
SAND
SILT
CLAY
SANDY CLAY OR CLAYEY SAND
SANDY SILT OR SILTY SAND
SILTY CLAY OR CLAYEY SILT
PEAT AND/OR ORGANIC MATTER
FILL MATERIAL
IGNEOUS ROCK
SEDIMENTARY ROCK
METAMORPHIC ROCK
CLASSIFICATION OF MATERIAL BASED ON STANDARD GRADE SIZE LIMITS
NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.
2170
2160
2150
2140
2130
2120
2110
2100
AS BUILT
CORRECTIONS BY
CONTRACT NO.
DATE
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
SHEET 7 OF 7
ROUTE 31 15 SEPARATION
LOG OF TEST BORINGS
SCALE As Noted
BRIDGE 54-793
PM 16.7
DRAWING 54783-7
Disregard prints bearing earlier numbers.
PREL. DRAWING No. PR-
BRIDGE DEPARTMENT
ENGINEERING GEOLOGY SECTION

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	215			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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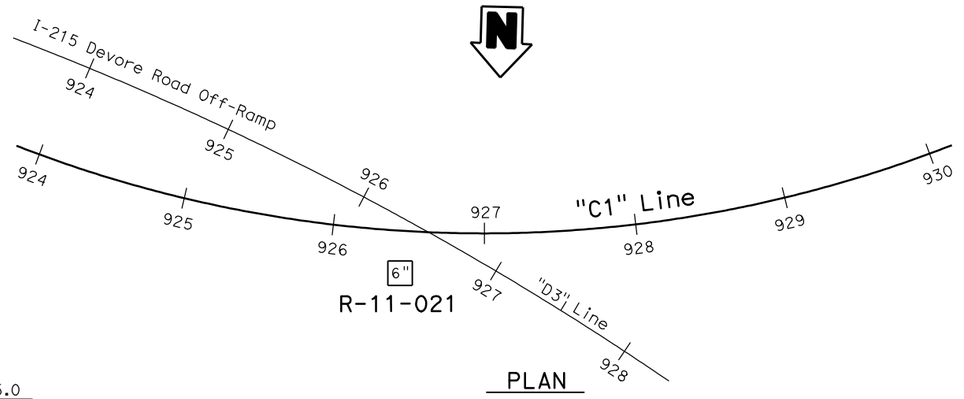
This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

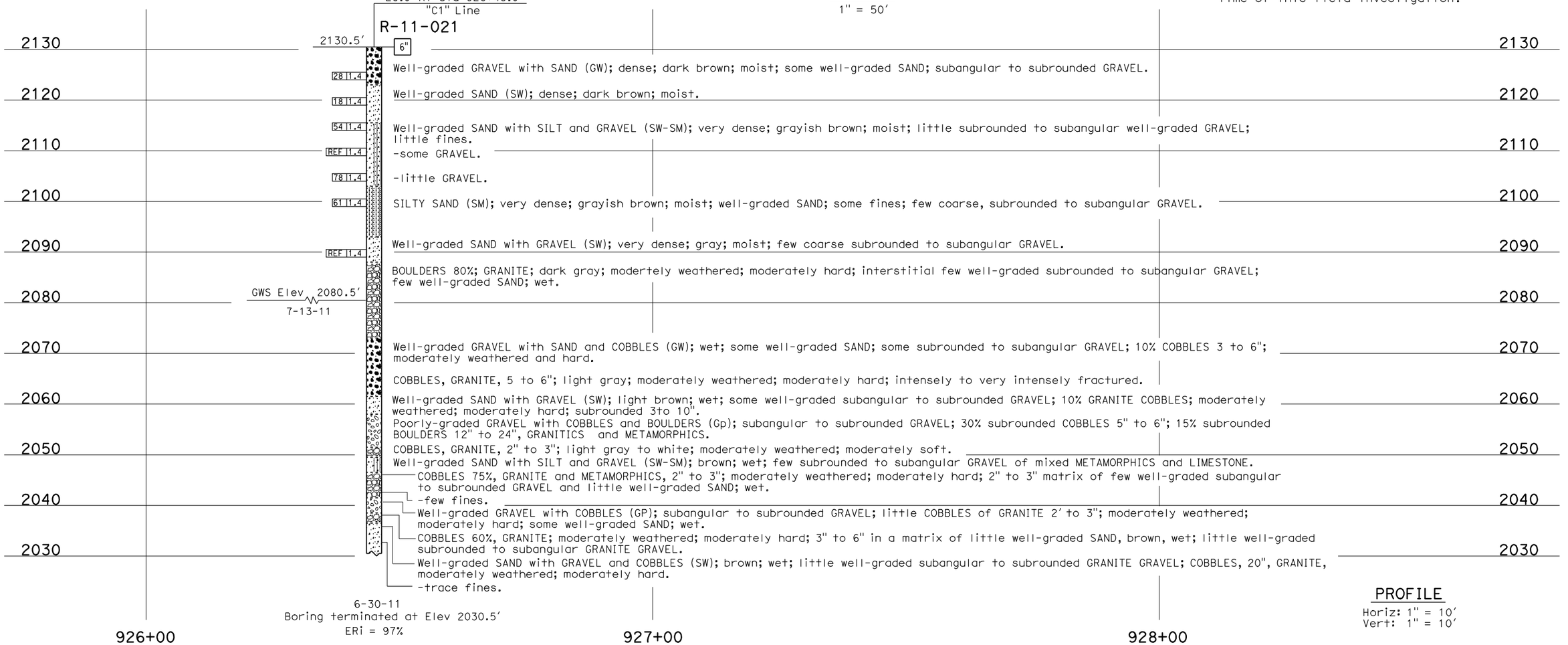
BENCH MARK

Set TBM at Base of Lamp located at 8.0 ft Rt "C1" Line Sta 925+65.0 assumed Elevation 2130.0′ (Topo) NAVD 1988.



PLAN
1" = 50′

Note: Ground water was encountered at the time of this field investigation.



PROFILE
Horiz: 1" = 10′
Vert: 1" = 10′

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	I-215 DEVORE ROAD OFF-RAMP UC
FUNCTIONAL SUPERVISOR	DRAWN BY: F. Nguyen 9/11	FIELD INVESTIGATION BY:	DESIGN BRANCH X	NEW	LOG OF TEST BORINGS 1 OF 3
NAME: A. Perez-Cobo	CHECKED BY: S. Logeswaran	B. Levine		POST MILE 17.54	

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 080000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
09-22-11	10-19-11			X	X

FILE => 215devore-offrmp1of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:05

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	215			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST
K. Douglas Cook
No. 1391
Exp. 12-31-11
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PLANS APPROVAL DATE

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

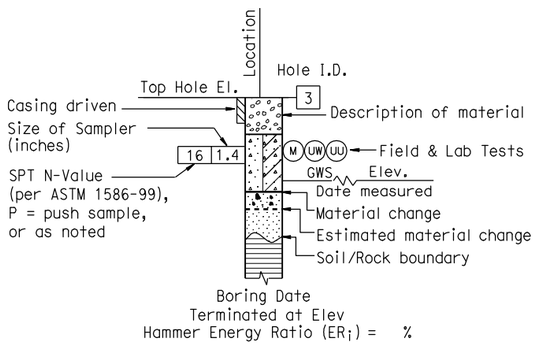
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

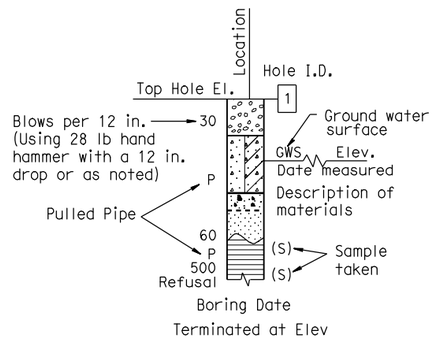
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

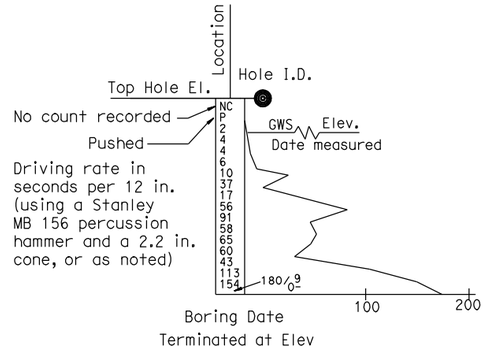
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



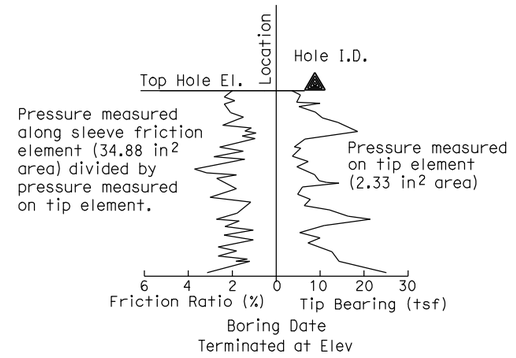
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	I-215 DEVORE ROAD OFF-RAMP UC
	PREPARED BY: F. Nguyen 9/11		DESIGN BRANCH X	POST MILE 17.54	LOG OF TEST BORINGS 2 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
				X	X

FILE => 215devore-offrmp2of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:05

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	215			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	I-215 DEVORE ROAD OFF-RAMP UC
	PREPARED BY: F. Nguyen 9/11		DESIGN BRANCH X	POST MILE 17.54	LOG OF TEST BORINGS 3 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES					SHEET	OF
					X	X

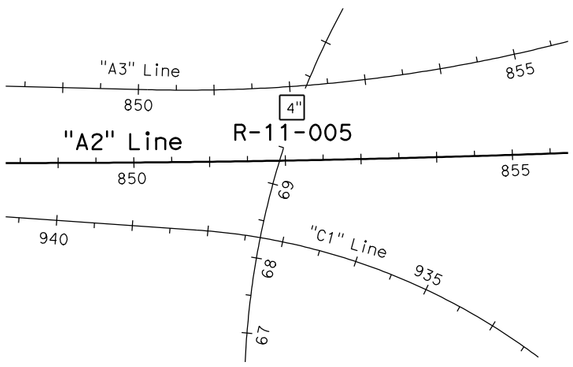
FILE => 215devore-offrmp3of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:05

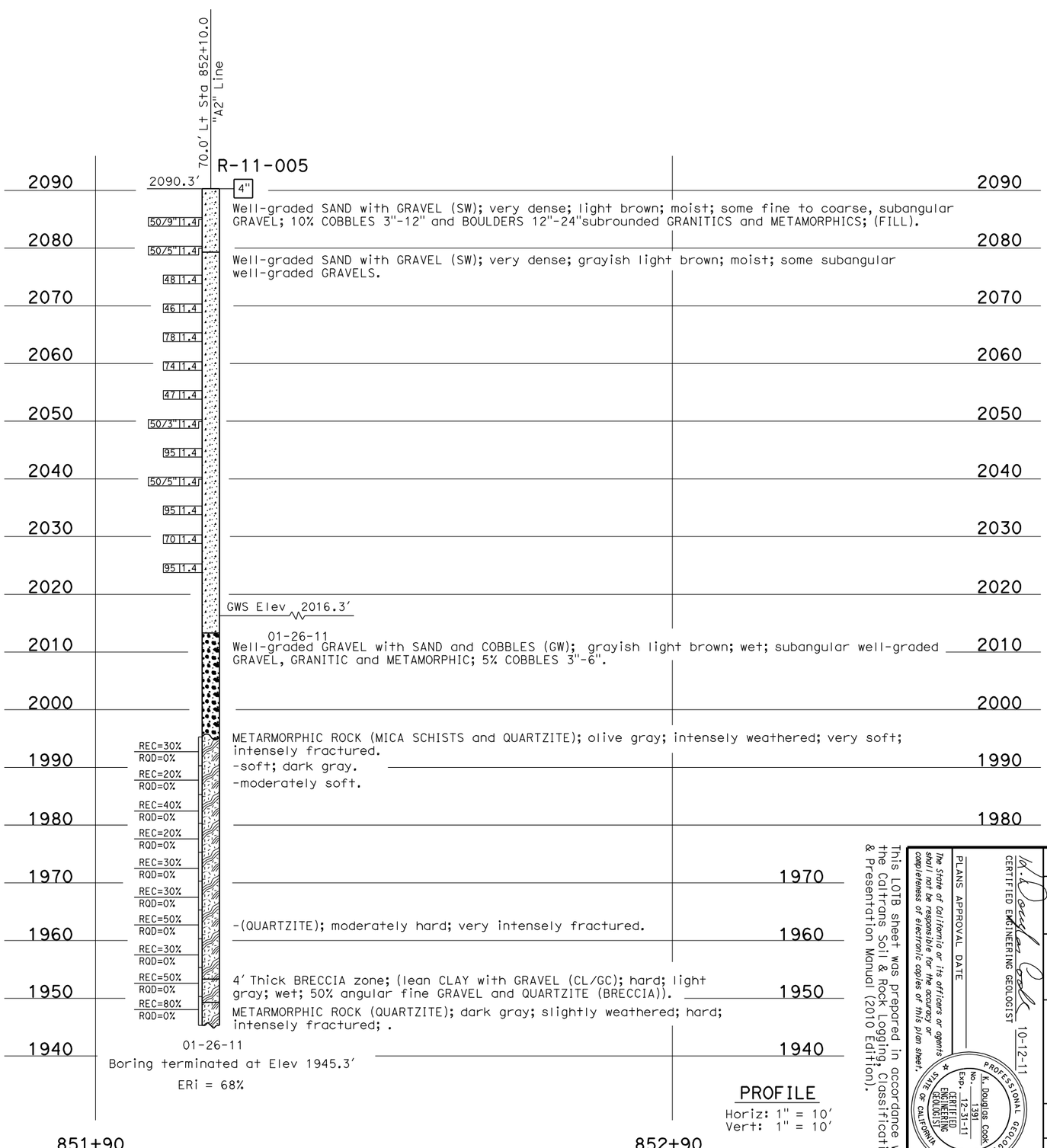
BENCH MARK

PNO 173 2120.910
FD STD Brass disk in concrete stamped "SBD-215-173 1988" 40' Ely of EOD Devore Rd Bridge at NIy end bridge; 70' NIy of EP NB SBD 215 at PM 17.3 at top of slope.

PNO 2010 2179.090
FD STD Brass disk in concrete stamped "D8 SCN SBD-15 PM 16.3 08.04.08" At top of slope SOUTH of Connector Bridge from NB SBD 15 to NB SBD 215.



PLAN
1" = 100'



PROFILE
Horiz: 1" = 10'
Vert: 1" = 10'

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

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PROFESSIONAL GEOLOGIST
No. 1391
Exp. 12-31-11
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
08	SBd	15			

ENGINEERING SERVICES
MATERIALS AND GEOTECHNICAL SERVICES

FUNCTIONAL SUPERVISOR
NAME: A. Perez-Cobo

DRAWN BY: F. Nguyen 6/11
CHECKED BY: B. Levine/S. Logeswaran

FIELD INVESTIGATION BY:
D. Cook

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH X

UNIT: 3643
PROJECT NUMBER & PHASE: 0800000003660
CONTRACT NO.: 08-0K7100

BRIDGE NO. 54-0781L
POST MILE 16.07

CAJON CREEK BRIDGE LEFT (WIDEN)

LOG OF TEST BORINGS 1 OF 5

SHEET	OF
X	X

REVISION DATES
08-26-11
10-12-11

DISREGARD PRINTS BEARING EARLIER REVISION DATES

DGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS
0 1 2 3

FILE => cajoncr-1tlof5.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 13:23

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST
K. Douglas Cook
No. 1391
Exp. 12-31-11
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PLANS APPROVAL DATE

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

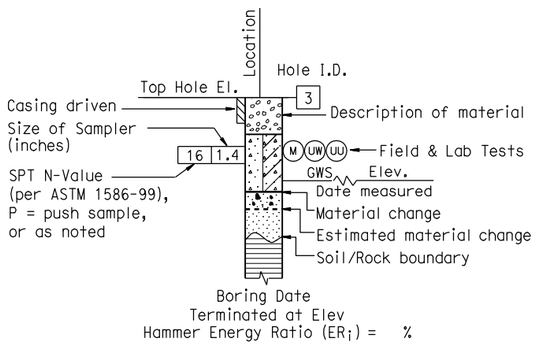
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

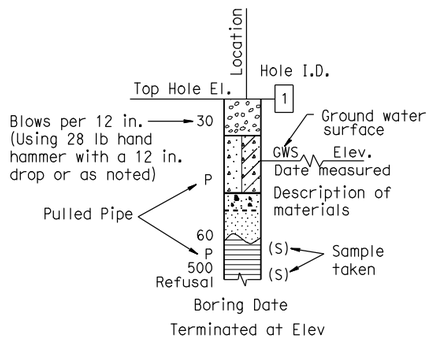
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

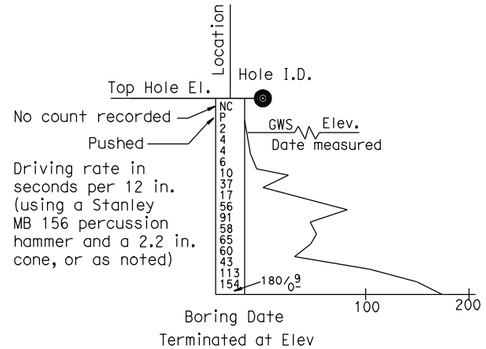
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



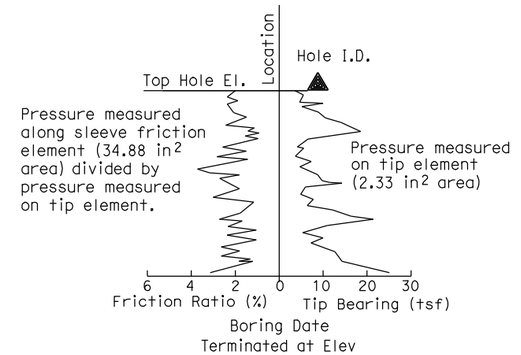
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	CAJON CREEK BRIDGE LEFT (WIDEN)
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	54-0781L POST MILE 16.07	LOG OF TEST BORINGS 2 OF 5

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
				X	X

FILE => cajoncr-lt2of5.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 13:23

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	CAJON CREEK BRIDGE LEFT (WIDEN)
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	54-0781L POST MILE 16.07	LOG OF TEST BORINGS 3 OF 5

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
				X	X

FILE => cajoncr-lt3of5.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 13:23

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

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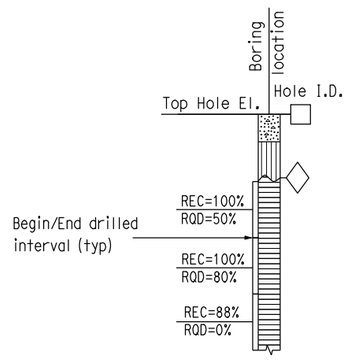
PROFESSIONAL GEOLOGIST — K. Douglas Cook No. 1391 Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

$$REC = \frac{\sum \text{Length of the recovered core pieces (in.)}}{\text{Total length of core run (in.)}} \times 100\%$$

$$RQD = \frac{\sum \text{Length of intact core pieces} \geq 4 \text{ in.}}{\text{Total length of core run (in.)}} \times 100\%$$

RQD* Indicates soundness criteria not met.



BEDDING SPACING

Description	Thickness / Spacing
Massive	Greater than 10 ft
Very Thickly Bedded	3 ft - 10 ft
Thickly Bedded	1 ft - 3 ft
Moderately Bedded	4 in. - 1 ft
Thinly Bedded	1 in. - 4 in.
Very Thinly Bedded	1/4 in. - 1 in.
Laminated	Less than 1/4 in.

LEGEND OF ROCK MATERIALS

- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

ROCK HARDNESS

Description	Criteria
Extremely Hard	Cannot be scratched with a pocketknife or sharp pick. Can only be chipped with repeated heavy hammer blows.
Very Hard	Cannot be scratched with a pocketknife or sharp pick. Breaks with repeated heavy hammer blows.
Hard	Can be scratched with a pocketknife or sharp pick with difficulty (heavy pressure). Breaks with heavy hammer blows.
Moderately Hard	Can be scratched with pocketknife or sharp pick with light or moderate pressure. Breaks with moderate hammer blows.
Moderately Soft	Can be grooved 1/16 in. deep with a pocketknife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Can be grooved or gouged easily by a pocketknife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.
Very Soft	Can be readily indented, grooved or gouged with fingernail, or carved with a pocketknife. Breaks with light manual pressure.

FRACTURE DENSITY

Description	Observed Fracture Density
Unfractured	No fractures.
Very Slightly Fractured	Core lengths greater than 3 ft.
Slightly Fractured	Core lengths mostly from 1 to 3 ft.
Moderately Fractured	Core lengths mostly from 4 in. to 1 ft.
Intensely Fractured	Core lengths mostly from 1 to 4 in.
Very Intensely Fractured	Mostly chips and fragments.

WEATHERING DESCRIPTORS FOR INTACT ROCK

Description	Diagnostic Features					General Characteristics
	Chemical Weathering-Discoloration and/or Oxidation		Mechanical Weathering-Grain Boundary Conditions (Disaggregation) Primarily for Granitics and Some Coarse-Grained Sediments	Texture and Leaching		
	Body of Rock	Fracture Surfaces		Texture	Leaching	
Fresh	No discoloration, not oxidized.	No discoloration or oxidation.	No separation, intact (tight).	No change	No leaching	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull.	Minor to complete discoloration or oxidation of most surfaces.	No visible separation, intact (tight).	Preserved	Minor leaching of some soluble minerals.	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty," feldspar crystals are "cloudy."	All fracture surfaces are discolored or oxidized.	Partial separation of boundaries visible.	Generally preserved	Soluble minerals may be mostly leached.	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in-situ disaggregation, see grain boundary conditions.	All fracture surfaces are discolored or oxidized, surfaces friable.	Partial separation, rock is friable; in semiarid conditions granitics are disaggregated.	Texture altered by chemical disintegration (hydration, argillation).	Leaching of soluble minerals may be complete.	Dull sound when struck with hammer, usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures, or veinlets. Rock is significantly weakened.
Decomposed	Discolored or oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay.		Complete separation of grain boundaries (disaggregated).	Resembles a soil, partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete.		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes."

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	CAJON CREEK BRIDGE LEFT (WIDEN)
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	54-0781L POST MILE 16.07	LOG OF TEST BORINGS 4 OF 5

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

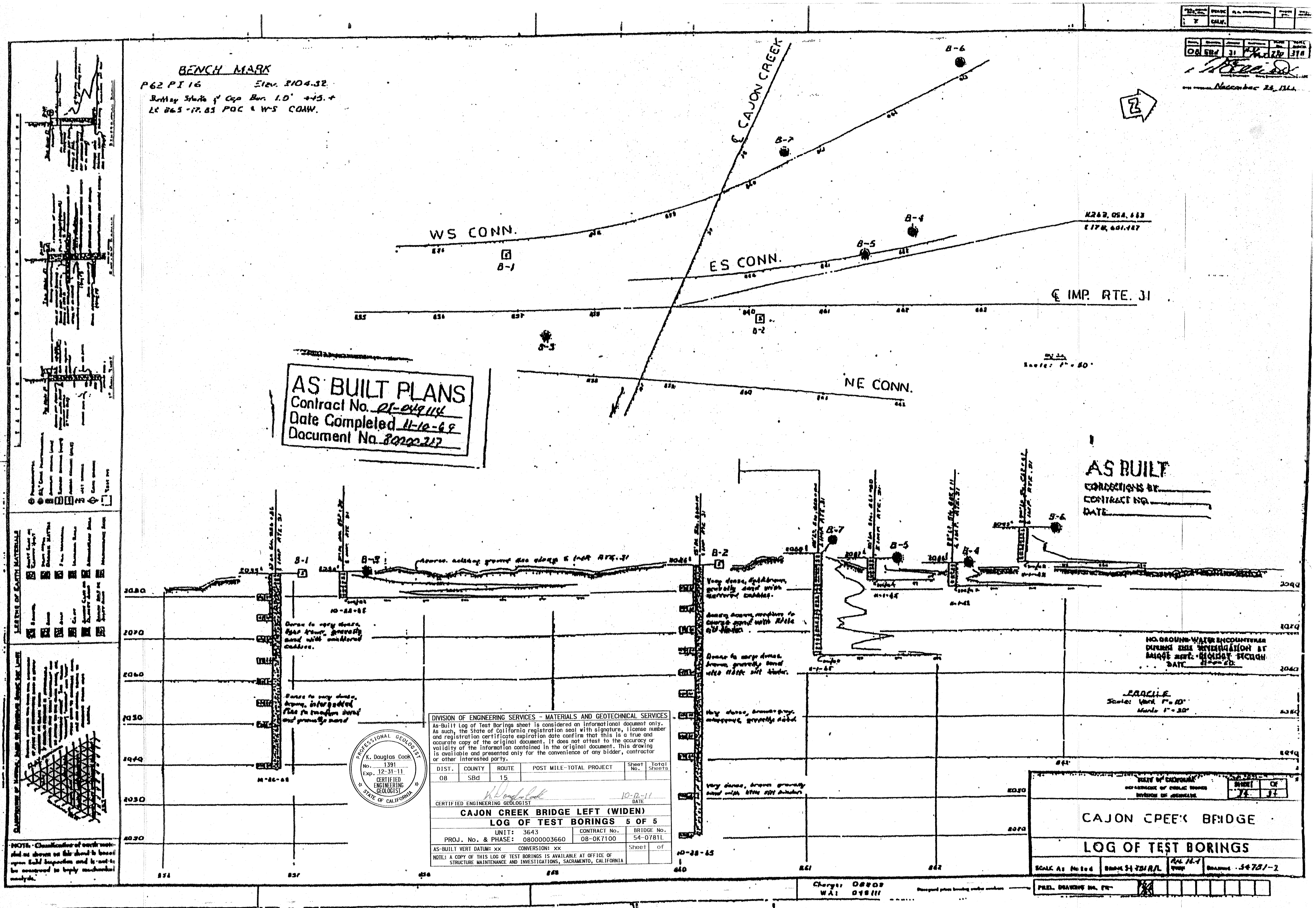
UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
				X	X

FILE => cajoncr-lt4of5.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 13:23



DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

As-Built Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	POST MILE-TOTAL PROJECT	Sheet No.	Total Sheets
08	SBd	15			

PROFESSIONAL GEOLOGIST K. Douglas Cook No. 1391 Exp. 12-31-11 CERTIFIED ENGINEERING GEOLOGIST STATE OF CALIFORNIA

CERTIFIED ENGINEERING GEOLOGIST — DATE 10-12-11

CAJON CREEK BRIDGE LEFT (WIDEN)

LOG OF TEST BORINGS 5 OF 5

UNIT: 3643 PROJ. No. & PHASE: 08000003660	CONTRACT No. 08-0K7100	BRIDGE No. 54-0781L

AS-BUILT VERT DATUM: xx CONVERSION: xx

Sheet of

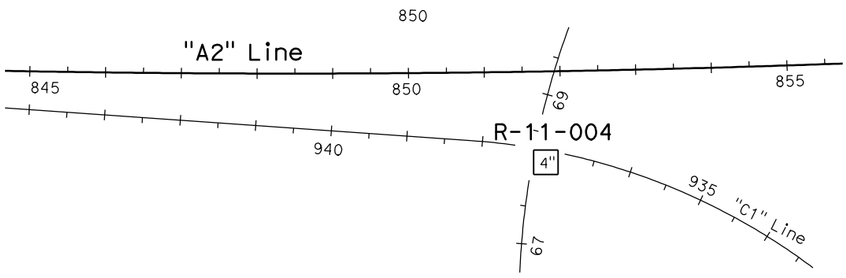
NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

BENCH MARK

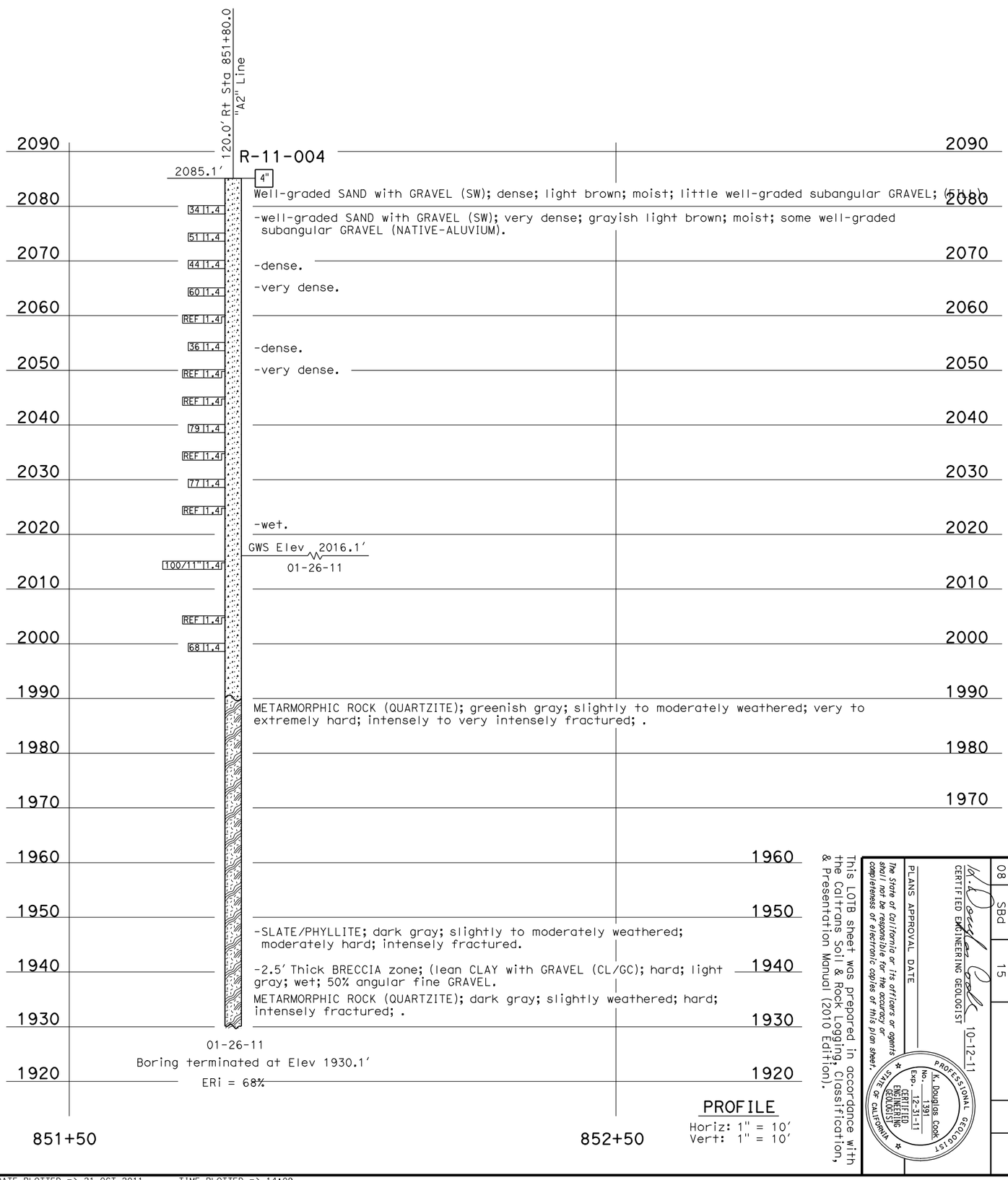
PNO 173 2120.910
FD STD Brass disk in concrete stamped "SBD-215-173 1988" 40′ Ely of EOD Devore Rd Bridge at NIy end bridge; 70′ NIy of EP NB SBD 215 at PM 17.3 at top of slope.

PNO 2010 2179.090
FD STD Brass disk in concrete stamped "D8 SCN SBD-15 PM 16.3 08.04.08" At top of slope SOUTH of Connector Bridge from NB SBD 15 to NB SBD 215.

CHECK PRINT
by _____



PLAN
1" = 100′



PROFILE
Horiz: 1" = 10′
Vert: 1" = 10′

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

W. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

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PROFESSIONAL GEOLOGIST
W. Douglas Cook
No. 1391
Exp. 12-31-11
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
08	SBd	15			

ENGINEERING SERVICES
MATERIALS AND GEOTECHNICAL SERVICES

FUNCTIONAL SUPERVISOR
NAME: A. Perez-Cobo

DRAWN BY: F. Nguyen 6/11
CHECKED BY: B. Levine/S. Logeswaran

FIELD INVESTIGATION BY:
D. Cook

DGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS
0 1 2 3

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH X

UNIT: 3643
PROJECT NUMBER & PHASE: 0800000366O
CONTRACT NO.: 08-0K7100

FILE => cajoncr-rt1of5.dgn

BRIDGE NO. 54-0781R
POST MILE 16.07

CAJON CREEK BRIDGE RIGHT (WIDEN)
LOG OF TEST BORINGS 1 OF 5

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES	SHEET	OF
09-26-11	X	X
10-12-11		

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 14:09

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST
K. Douglas Cook
No. 1391
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CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

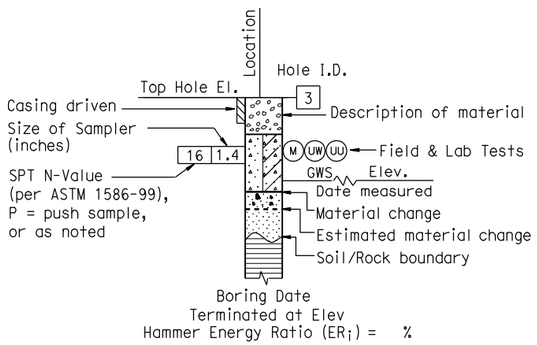
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

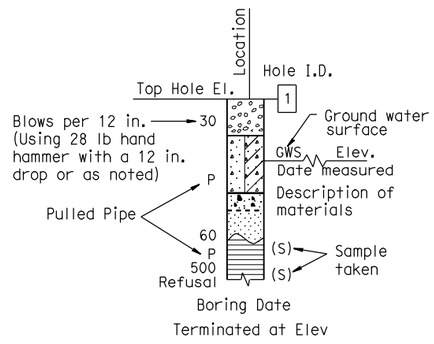
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

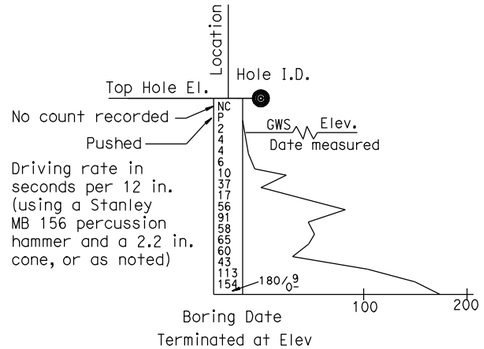
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



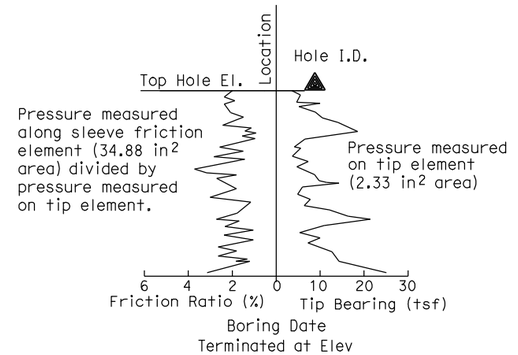
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	CAJON CREEK BRIDGE RIGHT (WIDEN)
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	54-0781L POST MILE 16.07	LOG OF TEST BORINGS 2 OF 5

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES					SHEET	OF
					X	X

FILE => cajoncr-rt2of5.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 14:09

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
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SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

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- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook No. 1391 Exp. 12-31-11 CERTIFIED ENGINEERING GEOLOGIST — 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.

APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH X	BRIDGE NO. 54-0781L POST MILE 16.07	CAJON CREEK BRIDGE RIGHT (WIDEN) LOG OF TEST BORINGS 3 OF 5
	PREPARED BY: F. Nguyen 6/11				

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
				X	X

FILE => cajoncr-rt3of5.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 14:09

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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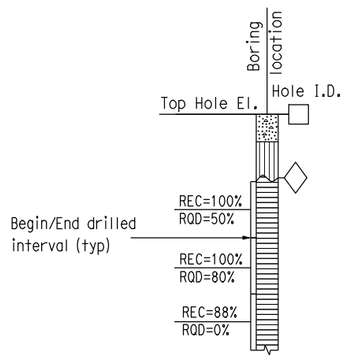
PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

$$REC = \frac{\sum \text{Length of the recovered core pieces (in.)}}{\text{Total length of core run (in.)}} \times 100\%$$

$$RQD = \frac{\sum \text{Length of intact core pieces} \geq 4 \text{ in.}}{\text{Total length of core run (in.)}} \times 100\%$$



RQD* Indicates soundness criteria not met.

BEDDING SPACING

Description	Thickness / Spacing
Massive	Greater than 10 ft
Very Thickly Bedded	3 ft - 10 ft
Thickly Bedded	1 ft - 3 ft
Moderately Bedded	4 in. - 1 ft
Thinly Bedded	1 in. - 4 in.
Very Thinly Bedded	1/4 in. - 1 in.
Laminated	Less than 1/4 in.

LEGEND OF ROCK MATERIALS

- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

ROCK HARDNESS

Description	Criteria
Extremely Hard	Cannot be scratched with a pocketknife or sharp pick. Can only be chipped with repeated heavy hammer blows.
Very Hard	Cannot be scratched with a pocketknife or sharp pick. Breaks with repeated heavy hammer blows.
Hard	Can be scratched with a pocketknife or sharp pick with difficulty (heavy pressure). Breaks with heavy hammer blows.
Moderately Hard	Can be scratched with pocketknife or sharp pick with light or moderate pressure. Breaks with moderate hammer blows.
Moderately Soft	Can be grooved 1/16 in. deep with a pocketknife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Can be grooved or gouged easily by a pocketknife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.
Very Soft	Can be readily indented, grooved or gouged with fingernail, or carved with a pocketknife. Breaks with light manual pressure.

FRACTURE DENSITY

Description	Observed Fracture Density
Unfractured	No fractures.
Very Slightly Fractured	Core lengths greater than 3 ft.
Slightly Fractured	Core lengths mostly from 1 to 3 ft.
Moderately Fractured	Core lengths mostly from 4 in. to 1 ft.
Intensely Fractured	Core lengths mostly from 1 to 4 in.
Very Intensely Fractured	Mostly chips and fragments.

WEATHERING DESCRIPTORS FOR INTACT ROCK

Description	Diagnostic Features					General Characteristics
	Chemical Weathering-Discoloration and/or Oxidation		Mechanical Weathering-Grain Boundary Conditions (Disaggregation) Primarily for Granitics and Some Coarse-Grained Sediments	Texture and Leaching		
	Body of Rock	Fracture Surfaces		Texture	Leaching	
Fresh	No discoloration, not oxidized.	No discoloration or oxidation.	No separation, intact (tight).	No change	No leaching	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull.	Minor to complete discoloration or oxidation of most surfaces.	No visible separation, intact (tight).	Preserved	Minor leaching of some soluble minerals.	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty," feldspar crystals are "cloudy."	All fracture surfaces are discolored or oxidized.	Partial separation of boundaries visible.	Generally preserved	Soluble minerals may be mostly leached.	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in-situ disaggregation, see grain boundary conditions.	All fracture surfaces are discolored or oxidized, surfaces friable.	Partial separation, rock is friable; in semiarid conditions granitics are disaggregated.	Texture altered by chemical disintegration (hydration, argillation).	Leaching of soluble minerals may be complete.	Dull sound when struck with hammer, usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures, or veinlets. Rock is significantly weakened.
Decomposed	Discolored or oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay.		Complete separation of grain boundaries (disaggregated).	Resembles a soil, partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete.		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes."

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	CAJON CREEK BRIDGE RIGHT (WIDEN)
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	54-0781L POST MILE 16.07	LOG OF TEST BORINGS 4 OF 5

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
				X	X

FILE => cajoncr-rt4of5.dgn

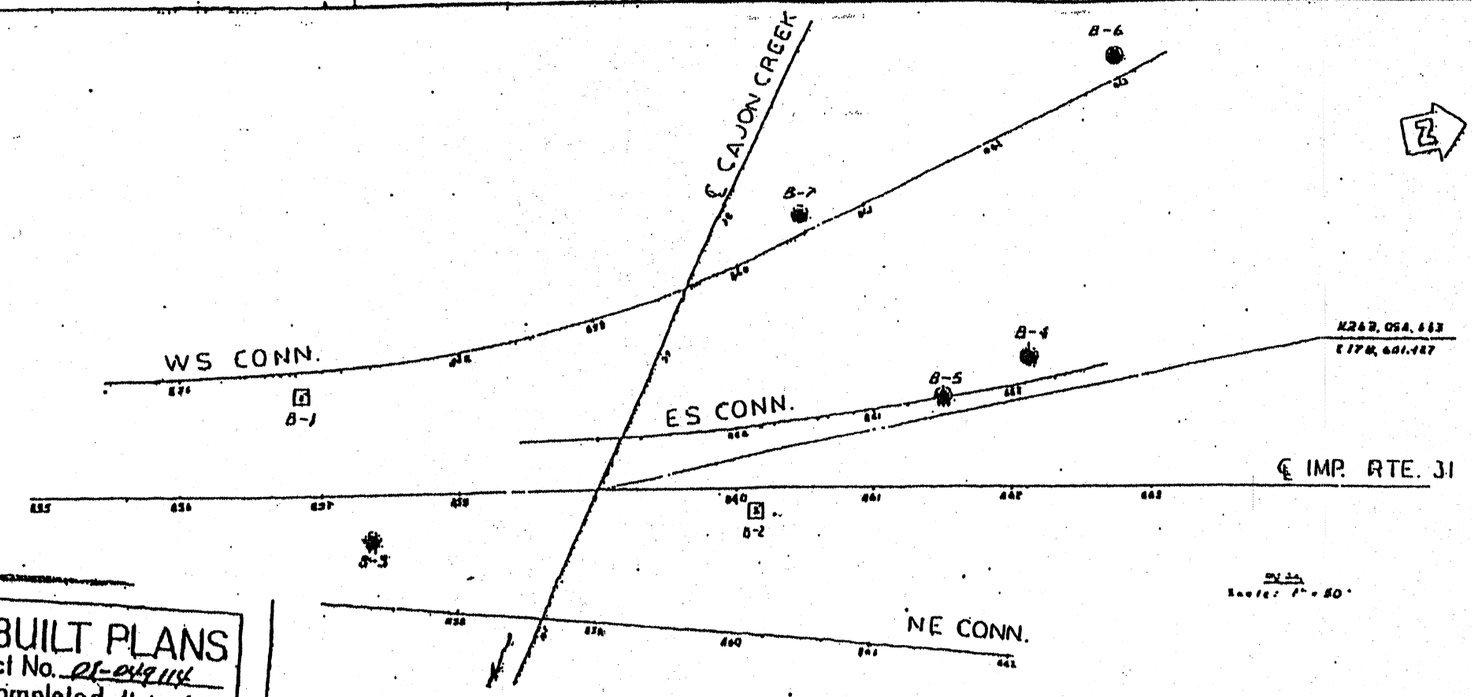
USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 14:09

BENCH MARK

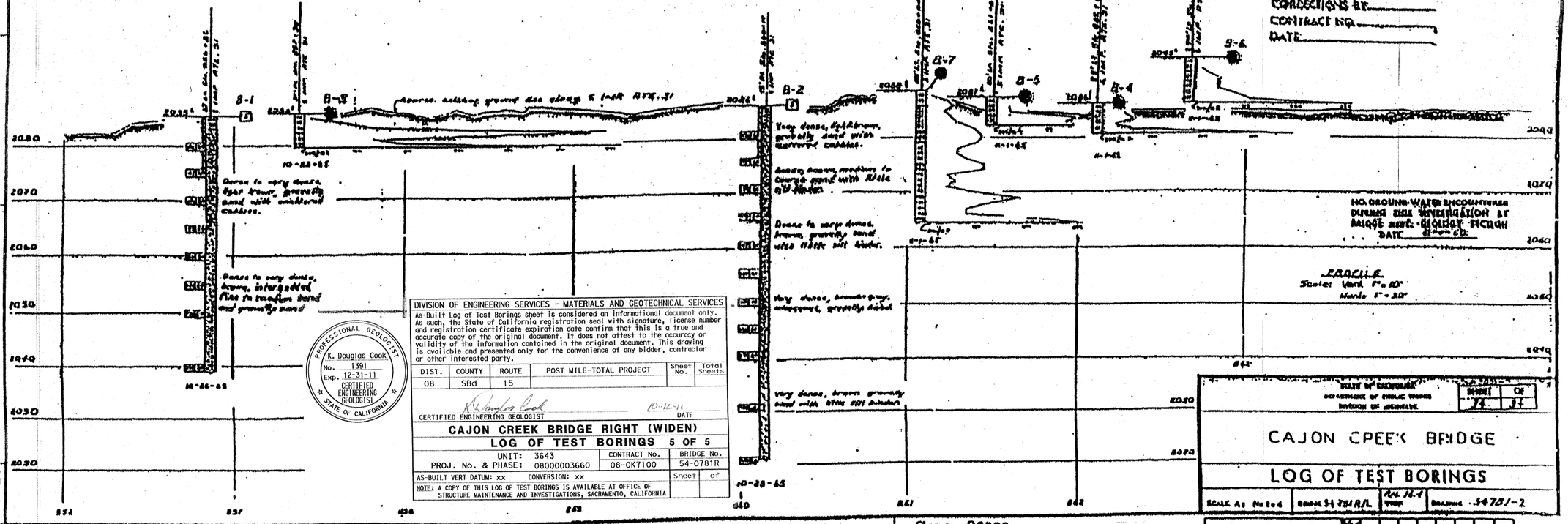
P62 PI 16 Elev. 2104.32

Bottley Stake 4" Cap Bur. 1.0' +45.4

Lt 865 -17.83 POC & WS CONN.



AS BUILT PLANS
Contract No. 08-0K7104
Date Completed 11-10-69
Document No. 20000217



NOTE - Classification of earth materials as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

As-Built Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	POST MILE-TOTAL PROJECT	Sheet No.	Total Sheets
08	SBd	15			

K. Douglas Cook — 10-12-11
CERTIFIED ENGINEERING GEOLOGIST — DATE

PROFESSIONAL GEOLOGIST
K. Douglas Cook
No. 1391
Exp. 12-31-11
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

CAJON CREEK BRIDGE RIGHT (WIDEN)

LOG OF TEST BORINGS 5 OF 5

UNIT: 3643	CONTRACT No.	BRIDGE No.
PROJ. No. & PHASE: 08000003660	08-0K7100	54-0781R

AS-BUILT VERT DATUM: xx CONVERSION: xx — Sheet — of

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

AS BUILT
CORRECTIONS BY
CONTRACT NO.
DATE

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
SHEET 14 OF 17

CAJON CREEK BRIDGE

LOG OF TEST BORINGS

SCALE As Noted — BRIDGE 54-781R/L — FILE 14-4 — DRAWING 54781-2

Charge: D8803
WA: 018111

PREL. DRAWING NO. PR-

Dec 28, 1966

BRIDGE DEPARTMENT

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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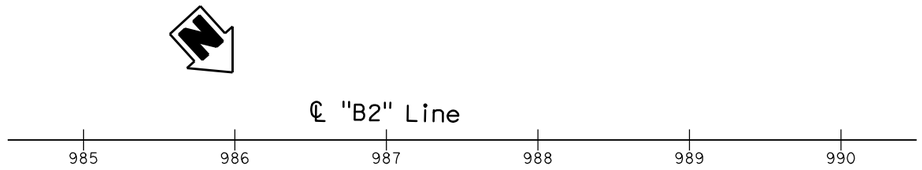
This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

BENCH MARK

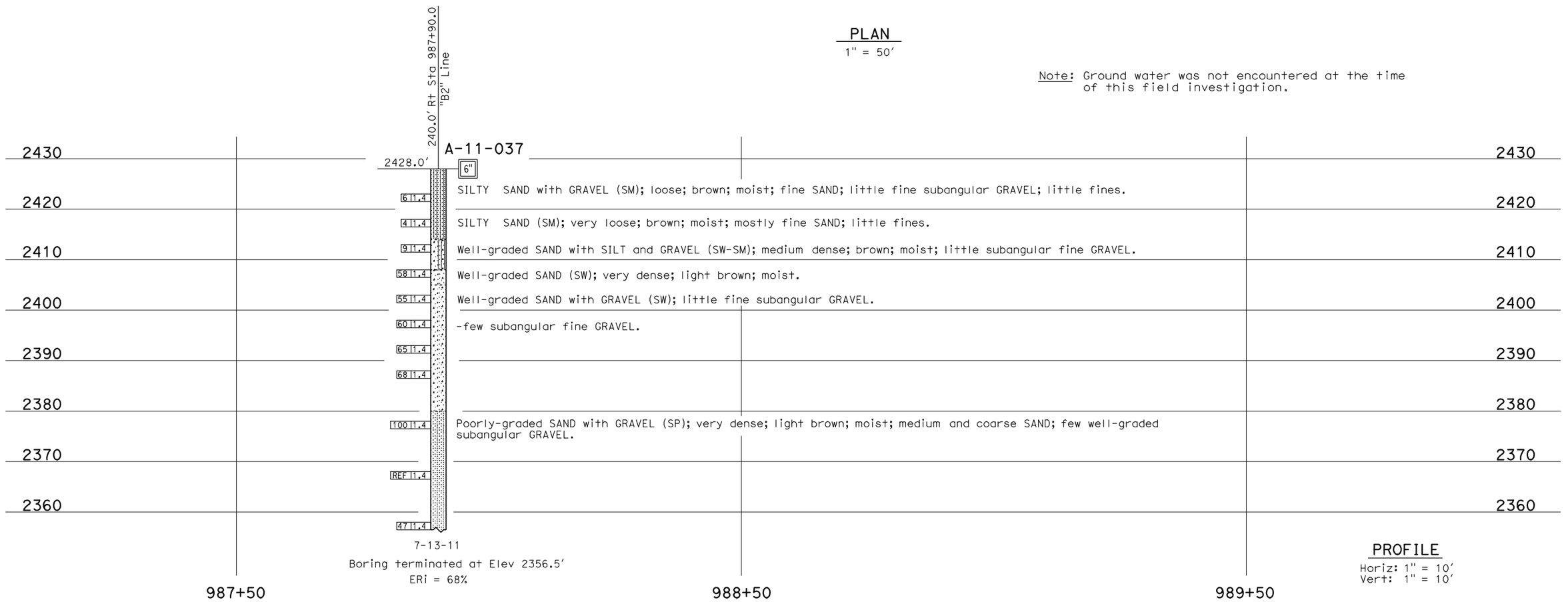
Set TBM on Survey TP 1154 located at 250.0 ft Rt Sta 987+90.0 "B2" Line assumed Elevation 2429.0′ NAVD 1988.



A-11-037
6"

PLAN
1" = 50′

Note: Ground water was not encountered at the time of this field investigation.



PROFILE
Horiz: 1" = 10′
Vert: 1" = 10′

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	PROPOSED 40 FT DEEP (WIDE) CUT SLOPE
FUNCTIONAL SUPERVISOR	DRAWN BY: F. Nguyen 9/11		DESIGN BRANCH X	NEW	
NAME: A. Perez-Cobo	CHECKED BY: B. Levine	FIELD INVESTIGATION BY: D. Cook		POST MILE R14.65	LOG OF TEST BORINGS 1 OF 3

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
09-26-11	10-19-11			X	X

FILE => cutslope1of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:08

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

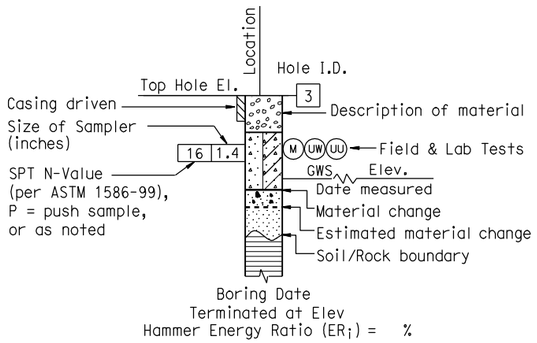
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

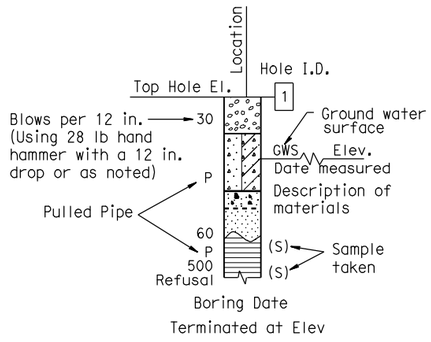
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

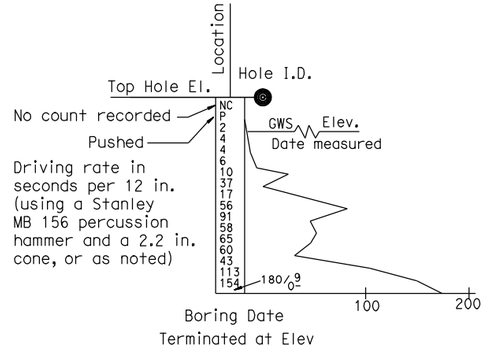
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



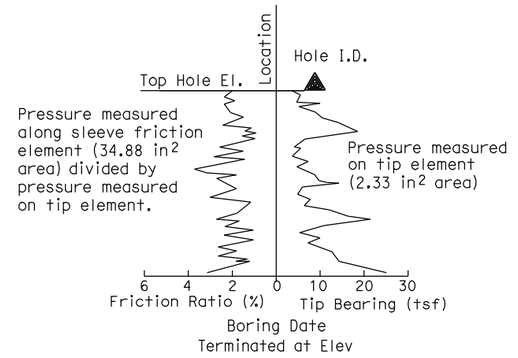
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	PROPOSED 40 FT DEEP (WIDE) CUT SLOPE
	PREPARED BY: F. Nguyen 9/11		DESIGN BRANCH X	POST MILE R14.65	LOG OF TEST BORINGS 2 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
10-19-11				X	X

FILE => cutslope2of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:09

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook No. 1391 Exp. 12-31-11 CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

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Description	Criteria
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Little	15 to 25%
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Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	PROPOSED 40 FT DEEP (WIDE) CUT SLOPE
	PREPARED BY: F. Nguyen 9/11		DESIGN BRANCH X	POST MILE R14.65	LOG OF TEST BORINGS 3 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES					SHEET	OF
10-19-11					X	X

FILE => cutslope3of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:09

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15/215			

K. Douglas Cook 02-24-12
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST
K. Douglas Cook
No. 1391
Exp. 12-31-13
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PLANS APPROVAL DATE

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This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

BENCH MARK

PNO 173 2120.910
Fd STD Brass disk in concrete stamped
"SBD-215-173 1988"
40′ Ely of EOD Devore Rd Bridge at Nly end Bidge;
70′ Nly of EP NB SBD 215 at PM 17.3 at top of slope.

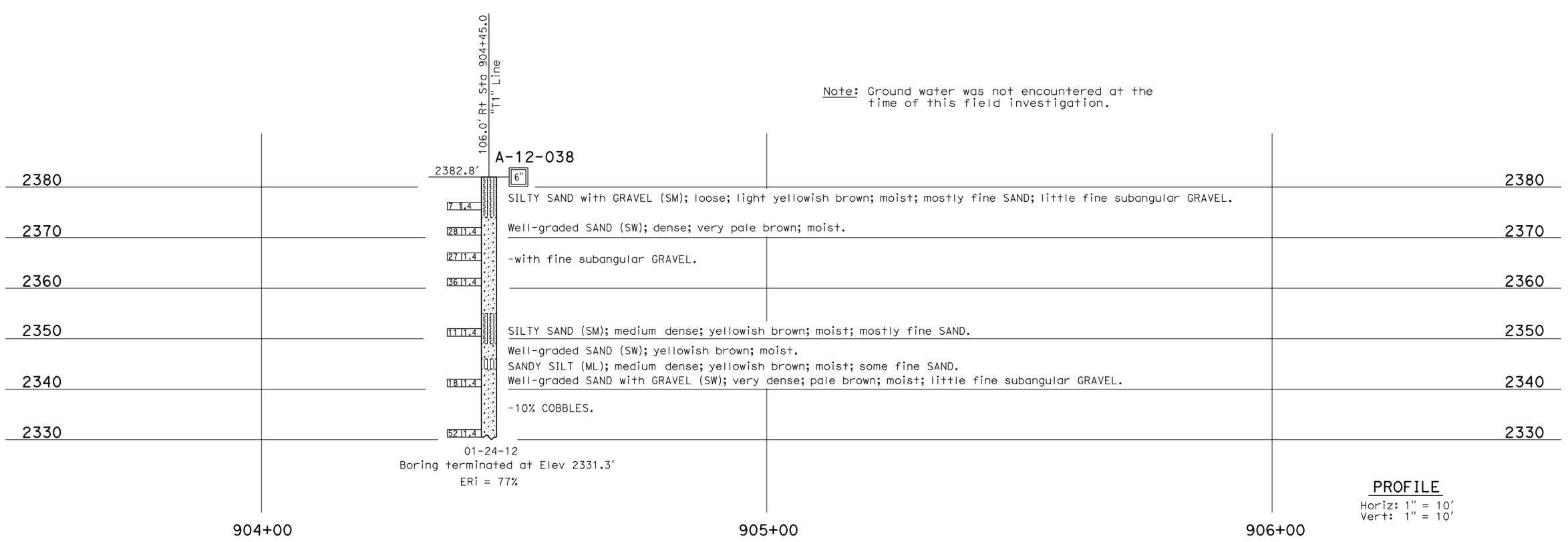
PNO 2010 2179.090
Fd STD Brass disk in concrete stamped
"D8 SCN SBD-15 PM 16.3 08.04.08"
At top of slope SOUTH of CONNECTOR BRIDGE
from NB SBD 15 to NB SBD 15 to NB SBD 215.

A-12-038
6"

"T1" Line
902 903 904 905 906 907

PLAN
1" = 50′

Note: Ground water was not encountered at the time of this field investigation.



PROFILE
Horiz: 1" = 10′
Vert: 1" = 10′

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	PROPOSED 50 FT DEEP CUT-AREA 2
FUNCTIONAL SUPERVISOR NAME: A. Perez-Cobo	DRAWN BY: F. Nguyen 8/11 CHECKED BY: M. Wilson	FIELD INVESTIGATION BY: D. Cook	DESIGN BRANCH X	POST MILE R14.50	LOG OF TEST BORINGS 1 OF 3

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
~~02-24-12~~	02-24-12			X	X

FILE => deepcut-area2-1of3.dgn

USERNAME => s128198 DATE PLOTTED => 24-FEB-2012 TIME PLOTTED => 12:54

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	215			

K. Douglas Cook 02-24-12
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-13 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

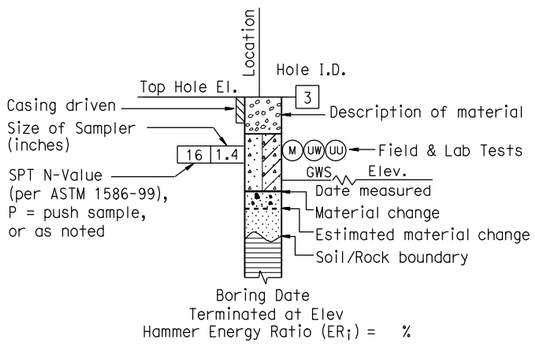
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

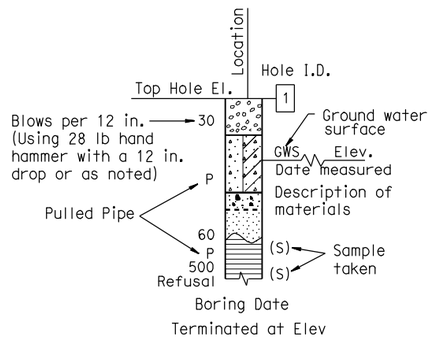
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

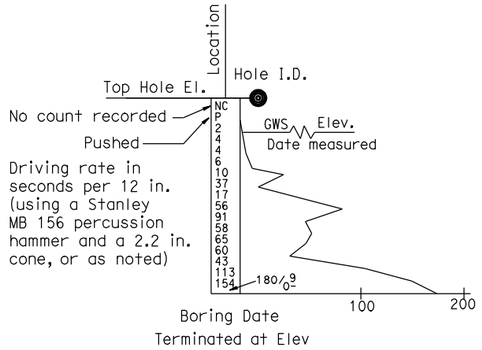
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



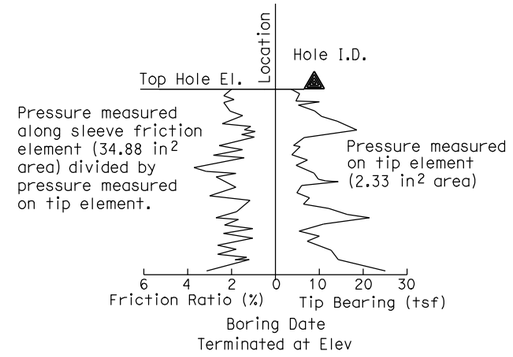
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	PROPOSED 50 FT DEEP CUT-AREA 2
	PREPARED BY: F. Nguyen 8/11		DESIGN BRANCH X	POST MILE R14.50	LOG OF TEST BORINGS 2 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
02-28-12	02-24-12			X	X

FILE => deepcut-area2-2of3.dgn

USERNAME => s128198 DATE PLOTTED => 24-FEB-2012 TIME PLOTTED => 12:54

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GM	SILTY GRAVEL SILTY GRAVEL with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL
SP	Poorly graded SAND Poorly graded SAND with GRAVEL
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SM	SILTY SAND SILTY SAND with GRAVEL
SC	CLAYEY SAND CLAYEY SAND with GRAVEL
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL
PT	PEAT
	COBBLES COBBLES and BOULDERS BOULDERS

Graphic/Symbol	Group Names
CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	215			

K. Douglas Cook 02-24-12
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-13 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES

MATERIALS AND GEOTECHNICAL SERVICES

PREPARED BY: F. Nguyen 8/11

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN
DESIGN BRANCH X

BRIDGE NO.

POST MILE R14.50

PROPOSED 50 FT DEEP CUT-AREA 2
LOG OF TEST BORINGS 3 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
02-22-12	02-24-12			X	X

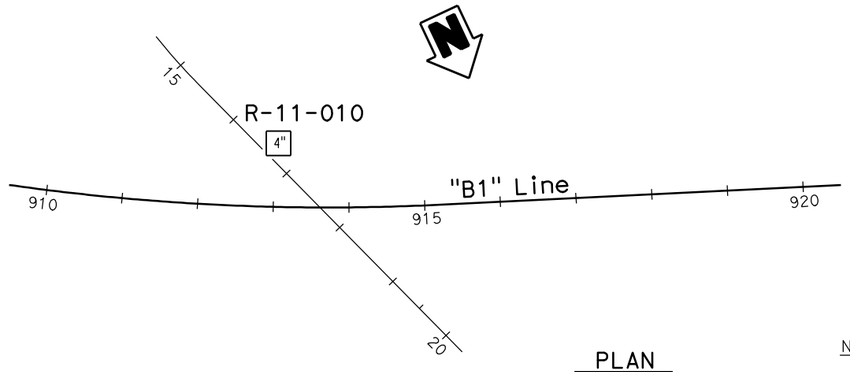
FILE => deepcut-area2-3of3.dgn

USERNAME => s128198 DATE PLOTTED => 24-FEB-2012 TIME PLOTTED => 12:54

BENCH MARK

PNO 173 2120.910
FD STD Brass disk in concrete stamped "SBD-215-173 1988" 40′ Ely of EOD Devore Rd Bridge at Nly end bridge; 70′ Nly of EP NB SBD 215 at PM 17.3 at top of slope.

PNO 2010 2179.090
FD STD Brass disk in concrete stamped "D8 SCN SBD-15 PM 16.3 08.04.08" At top of slope SOUTH of Connector Bridge from NB SBD 15 to NB SBD 215.



PLAN
1" = 100′

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	215			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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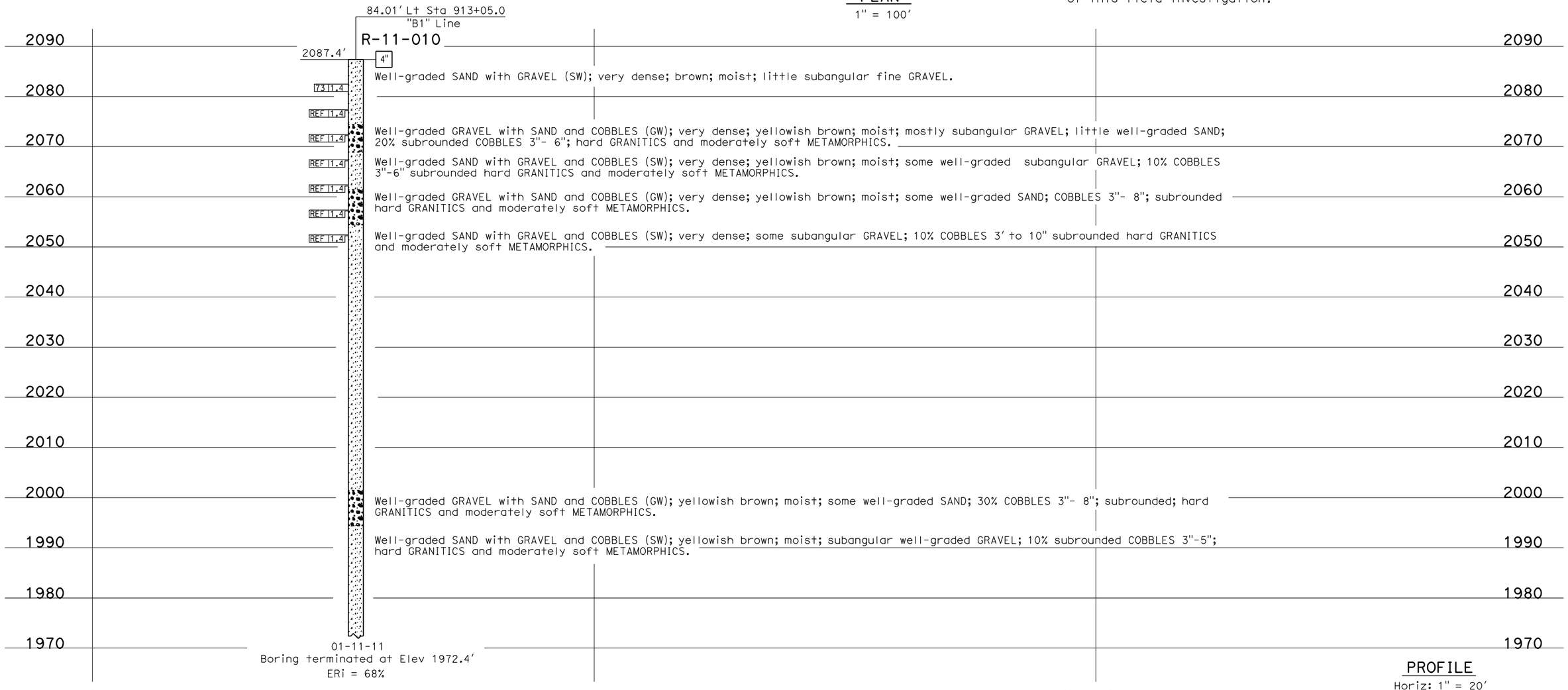
Note: Ground water was not encountered at the time of this field investigation.



PROFILE
Horiz: 1" = 20′
Vert: 1" = 10′

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	DEVORE OC (REPLACE)
FUNCTIONAL SUPERVISOR	DRAWN BY: F. Nguyen 6/11		DESIGN BRANCH X	NEW	LOG OF TEST BORINGS 1 OF 4
NAME: A. Perez-Cobo	CHECKED BY: B. Levine/S. Logeswaran	FIELD INVESTIGATION BY: D. Cook, C. Hoadley		POST MILE 17.3	

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-26-11	10-03-11			X	X

FILE => devore-oc1of4.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 13:29

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	215			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

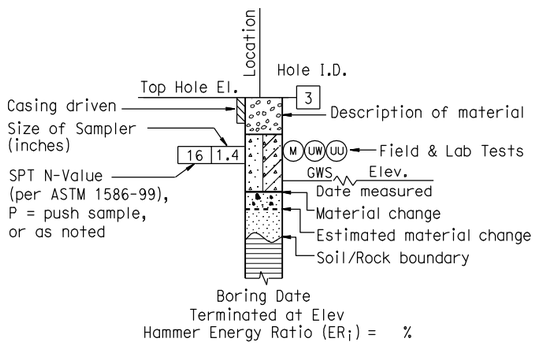
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

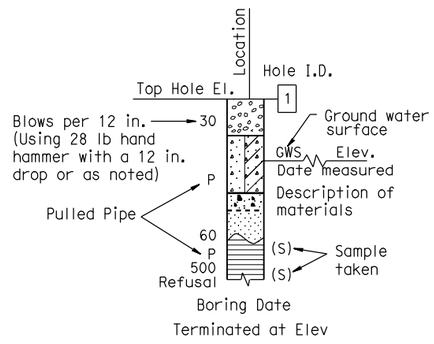
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

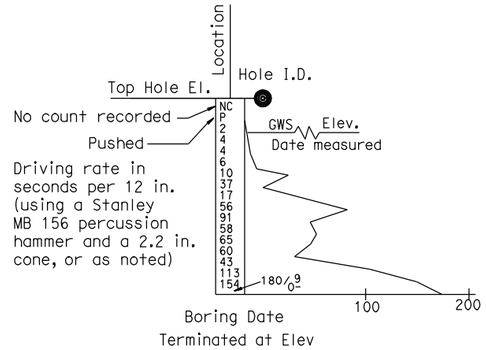
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



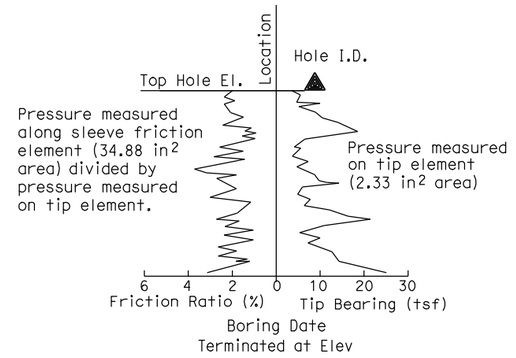
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	DEVORE OC (REPLACE)
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	NEW POST MILE 17.3	LOG OF TEST BORINGS 2 OF 4

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-26-11				X	X

FILE => devore-oc2of4.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 13:29

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	215			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — 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.

APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	DEVORE OC (REPLACE)
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	NEW POST MILE 17.3	LOG OF TEST BORINGS 3 OF 4

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-26-11				X	X

FILE => devore-oc3of4.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 13:29

DIST	COUNTY	ROUTE	POST MILE-TOTAL PROJECT	Sheet No.	Total Sheets
7	LA	2-MP 0.0		133	133

15

May 27, 1937

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

As-Built Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	POST MILE-TOTAL PROJECT	Sheet No.	Total Sheets
08	SBd	15			

K. Douglas Cook — 10-12-11
CERTIFIED ENGINEERING GEOLOGIST — DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

DEVORE OC (REPLACE)

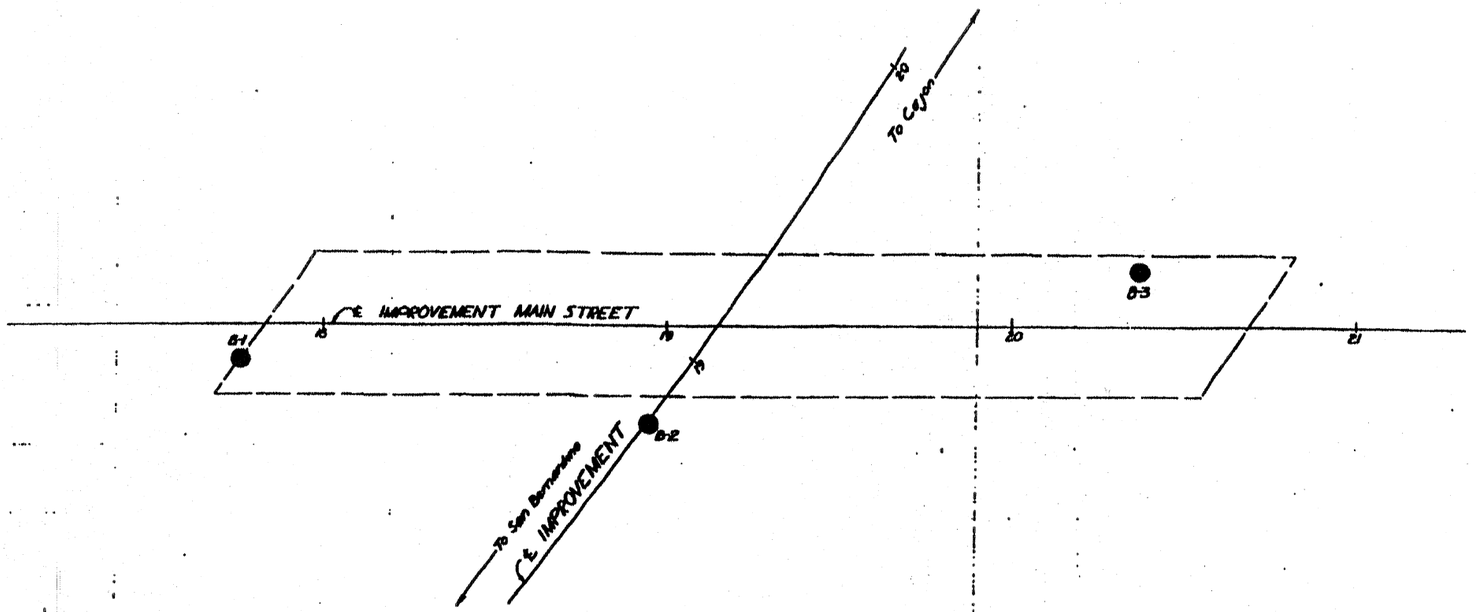
LOG OF TEST BORINGS 4 OF 4

UNIT: 3643	CONTRACT No.	BRIDGE No.
PROJ. No. & PHASE: 0800000366O	08-0K7100	NEW
AS-BUILT VERT DATUM: xx CONVERSION: xx		Sheet of

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

AS BUILT PLANS
Contract No. 58-8 Vc 7
Date Completed
Document No. 80000737

BRIDGE DEPARTMENT



* Spread Footings constructed as per plans

B.M. "2A-16
Elev. 2060.60
Lead & Tack in S.E. Cor. Conc. Water Valve Box
64 Lt. 8.00' "SVSB"

AS BUILT "No Change"
CORRECTIONS BY
CONTRACT NO. 58-8 VC 7-51
8-29-58

CLASSIFICATION OF MATERIAL BASED ON STANDARD GRADE SIZE LIMITS

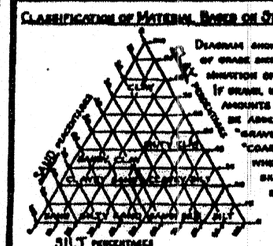


DIAGRAM SHOWING THE BASIS FOR ESTIMATES OF GRADE AND DISTRIBUTION USED IN DETERMINATION OF CLASS NAMES.

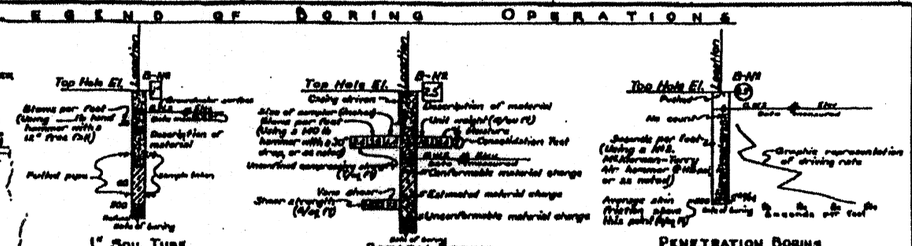
IF GRAVEL IS PRESENT IN APPRECIABLE AMOUNTS THE TERM "GRAVELLY" MAY BE ADDED TO THE CLASS NAME, VIZ. "GRAVELLY SAND." THE TERMS "COARSE," "MEDIUM" AND "FINE" WHEN USED TO DESCRIBE SAND, SILT AND GRAVEL REFER TO STANDARD GRADE SIZE LIMITS.

LEGEND OF EARTH MATERIALS

- Gravel
- Sand
- Silt
- Clay
- Sandy Clay or Clayey Sand
- Sandy Silt or Silty Sand
- Silty Clay or Clayey Silt
- Peat and/or Organic Matter
- Fill Material
- Igneous Rock
- Sedimentary Rock
- Metamorphic Rock

LEGEND OF BORING OPERATIONS

- Plan of any boring
- Penetrometer
- 2½" Cone Penetrometer
- Sampler boring (dry)
- Rotary boring (wet)
- Auger boring (dry)
- Jet boring
- Core boring
- Test pit



NOTES

The contractor's attention is directed to Section 2, Article (c) of the Standard Specifications and to the Special Provisions accompanying this set of plans.

Classification of the material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

DEVORE RD.
MAIN STREET OVERCROSSING

LOG OF TEST BORINGS

Horiz. 1" = 20' Vert. 1" = 10' | Drawing 51-525 | File E-52 | Submitted --1935-36

33

I HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE COPY OF THE ABOVE DOCUMENT TAKEN UNDER MY DIRECTION AND CONTROL ON THIS DATE IN SACRAMENTO, CALIFORNIA PURSUANT TO AUTHORIZATION BY THE DIRECTOR OF PUBLIC WORKS.

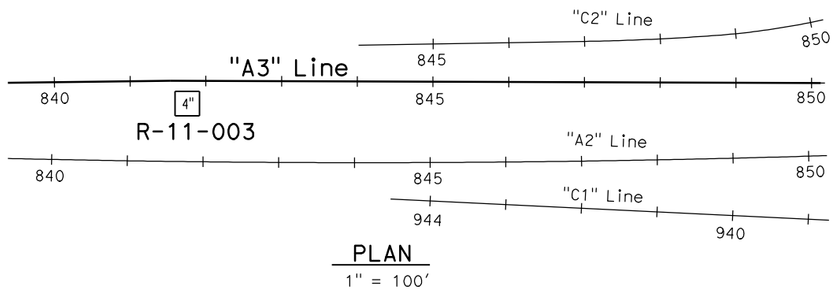
DATE March 6, 1971 SIGNATURE [illegible] TITLE Highway Transportation Officer I

BENCH MARK

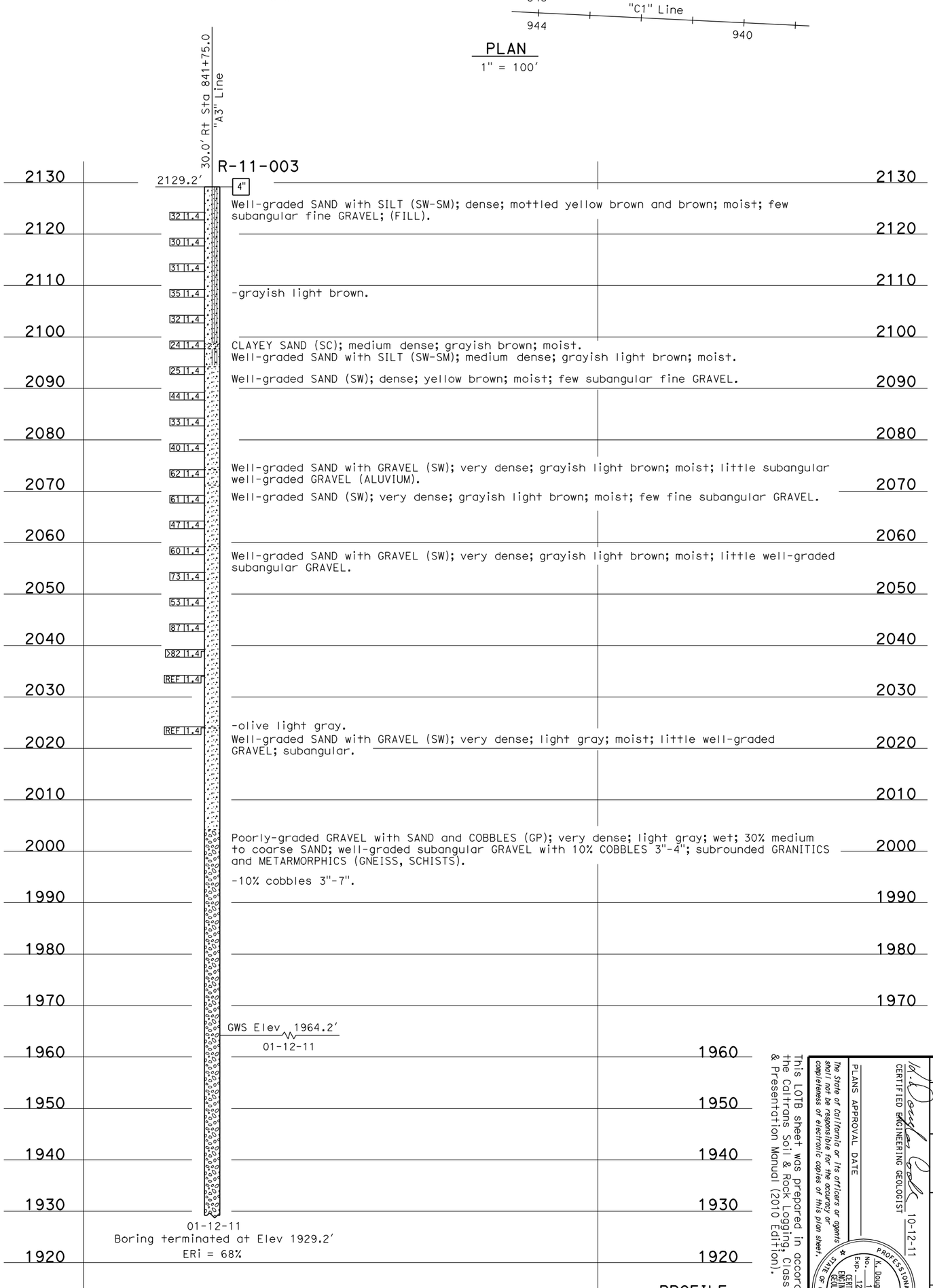
PNO 173 2120.910
FD STD Brass disk in concrete stamped "SBD-215-173 1988" 40′ Ely of EOD Devore Rd Bridge at Nly end bridge; 70′ Nly of EP NB SBD 215 at PM 17.3 at top of slope.

PNO 2010 2179.090
FD STD Brass disk in concrete stamped "D8 SCN SBD-15 PM 16.3 08.04.08" At top of slope SOUTH of Connector Bridge from NB SBD 15 to NB SBD 215.

CHECK PRINT
by _____



PLAN
1" = 100′



PROFILE
Horiz: 1" = 10′
Vert: 1" = 10′

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

W. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

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.

PROFESSIONAL GEOLOGIST
W. DOUGLAS COOK
No. 1391
Exp. 12-31-11
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
08	SBd	15			

ENGINEERING SERVICES
MATERIALS AND GEOTECHNICAL SERVICES

FUNCTIONAL SUPERVISOR
NAME: A. Perez-Cobo

DRAWN BY: F. Nguyen 6/11
CHECKED BY: B. Levine/S. Logeswaran

FIELD INVESTIGATION BY:
D. Cook, C. Hoadley

DOS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES
FOR REDUCED PLANS

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH X

BRIDGE NO. 54-0818L/R
POST MILE 15.90

UNIT: 3643
PROJECT NUMBER & PHASE: 0800000003660
CONTRACT NO.: 08-0K7100

FILE => devore-oh1of4.dgn

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES	SHEET	OF
08-OCT-11 10-12-11	X	X

DEVORE OH (WIDEN)
LOG OF TEST BORINGS 1 OF 4

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 14:11

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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.

CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

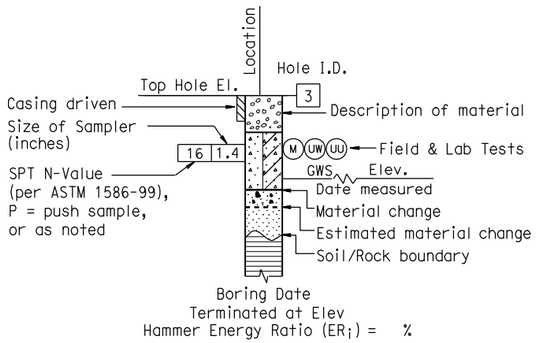
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

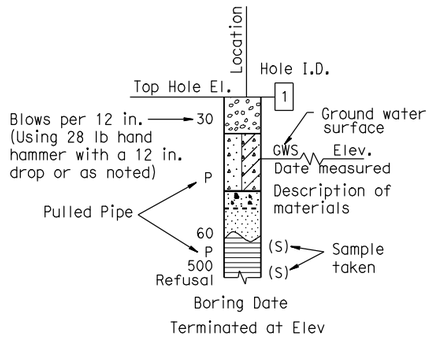
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

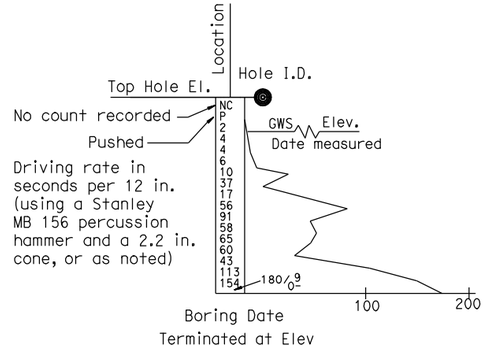
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



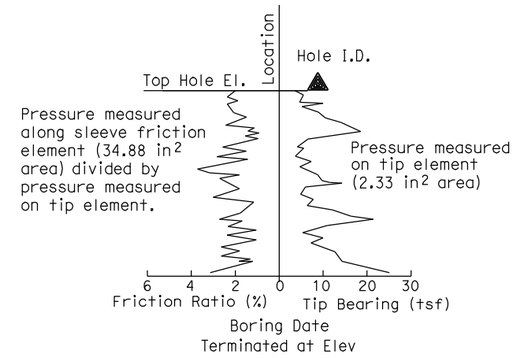
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	DEVORE OH (WIDEN)
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	54-0818L/R POST MILE 15.90	LOG OF TEST BORINGS 2 OF 4

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-26-11				X	X

FILE => devore-oh2of4.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 14:11

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook No. 1391 Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	DEVORE OH (WIDEN)
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	54-0818L/R POST MILE 15.90	LOG OF TEST BORINGS 3 OF 4

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES	SHEET	OF
08-26-11	X	X

FILE => devore-oh3of4.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 14:11

FED. ROAD DIV. No.	STATE	F. A. PROJECT No.	SHEET No.	TOTAL SHEETS
7	CALIF.			

DIST.	COUNTY	ROUTE	SECTION	SHEET No.	TOTAL SHEETS
08	SBd	31	14/16/17	238	338

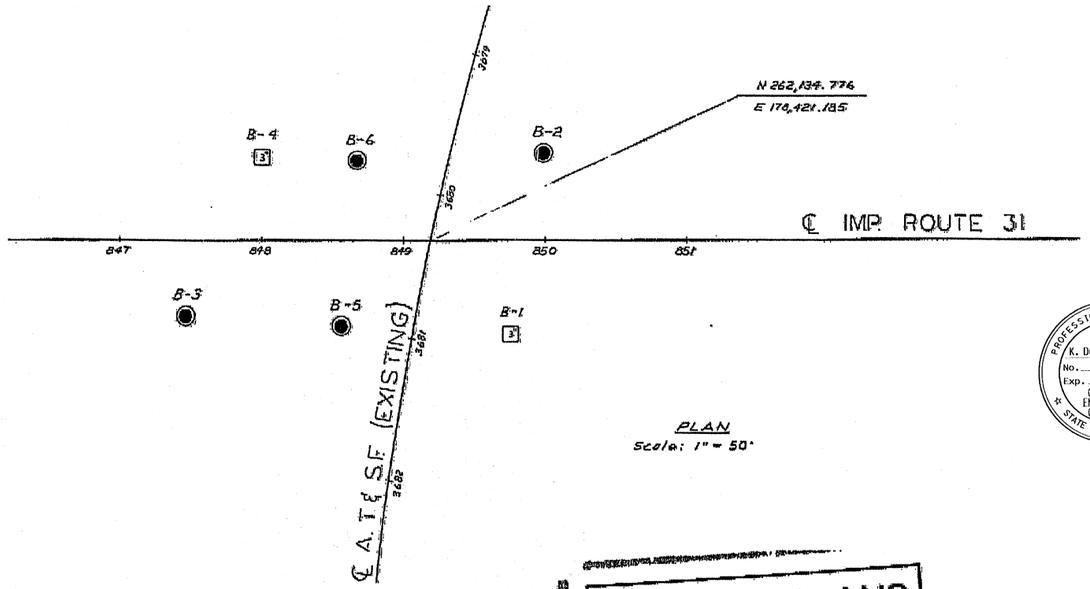
BRIDGE ENGINEER — CIVIL ENGINEER — STRUCTURAL ENGINEER

DATE APPROVED: November 28, 1966

BENCH MARKS

B.M. = P 62 P.I. 15
Bothey Stake & Cap Bur. 12'
560.8' Lt. 850+88.88 POT ℄ IMP. RTE. 31
Elev. 2093.33

B.M. = P.62 P.I.16
Bothey Stake & Cap Bur. 12'
445.4 Lt. 865 + 17.85 POC ℄ W-S CONN
Elev. 2104.82



PLAN
Scale: 1" = 50'

PROFESSIONAL GEOLOGIST
K. Douglas Cook
No. 1391
Exp. 12-31-11
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

As-Built Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	POST MILE-TOTAL PROJECT	Sheet No.	Total Sheets
08	SBd	15			

K. Douglas Cook — 10-12-11
CERTIFIED ENGINEERING GEOLOGIST — DATE

DEVORE OH (WIDEN)
LOG OF TEST BORINGS 4 OF 4

UNIT: 3643	CONTRACT No.	BRIDGE No.
PROJ. No. & PHASE: 08000003660	08-0K7100	54-0818L/R
AS-BUILT VERT DATUM: xx CONVERSION: xx		Sheet of

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

AS BUILT PLANS
Contract No. 08-049114
Date Completed 11-10-69
Document No. 80000217

AS BUILT
CORRECTIONS BY
CONTRACT NO.
DATE

LEGEND OF BORING OPERATIONS

Penetrometer; 2½" Cone Penetrometer; Sampler Boring (Drv); Rotary Boring (Drv); Auger Boring; Jet Boring; Core Boring; Test Pit

Penetrometer: Top Hole El. 8'6"; Driven with 140 lb. hammer falling 30" (Blows per foot); Pt. cone; Boring advanced by jetting with water; Boring advanced by rotary drilling with water as coolant; Penetrometer withdrawn; Penetrometer Test
Rotary Boring: Top Hole El. 8'6"; Size of casing (Diam.) & depth; Size of sampling device (Diam.) & depth; Undisturbed sampling device; Size of core barrel (Diam.) & depth; Core sample; Undisturbed material change; Approximate material change; Groundwater level; Rotary Boring
1" Soil Tube: Top Hole El.; Sloped bar (Type of sampler) (Diameter) at 45° to horizontal; Pulled from ground; Soil tube; Sample taken; Undisturbed material change; Approximate material change; Groundwater level; 1" Soil Tube

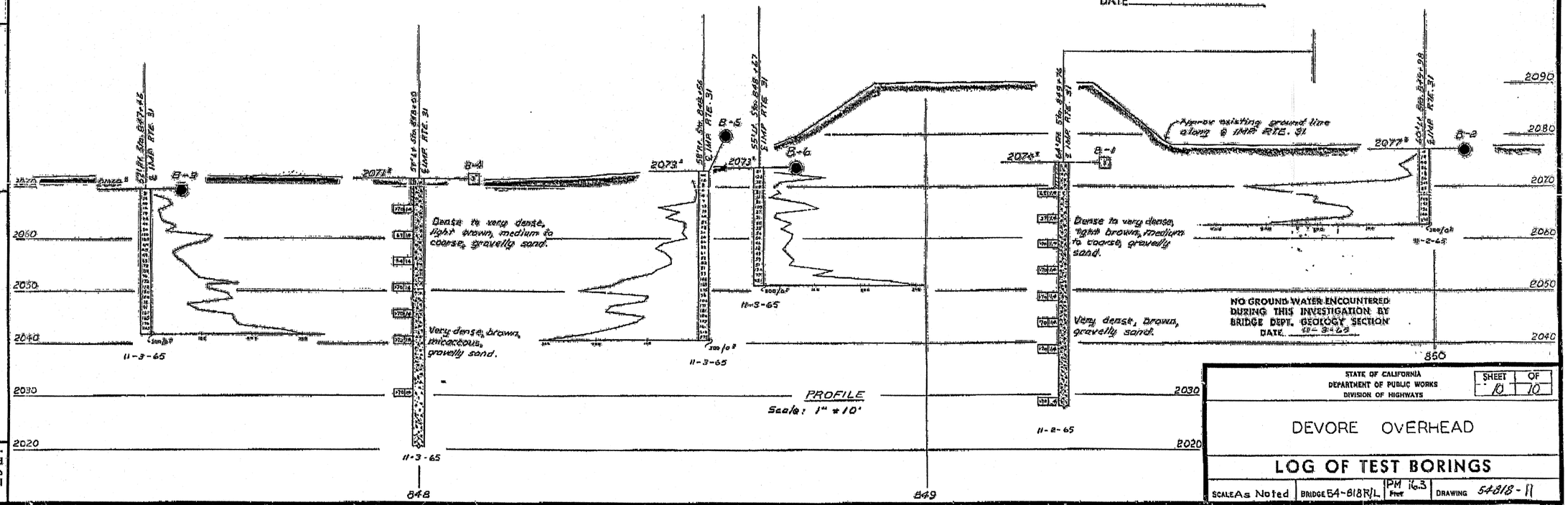
LEGEND OF EARTH MATERIALS

Gravel; Sand; Silt; Clay; Sandy Clay or Clayey Sand; Silty Silt or Silty Fine Sand; Silty Clay or Clayey Silt; Peat and/or Organic Matter; Fill Material; Igneous Rock; Sedimentary Rock; Metamorphic Rock

CLASSIFICATION OF MATERIAL BASED ON STANDARD GRADE SIZE LIMITS

Diagram showing the base for establishing grade size distribution used in determination of class names. If gravel is present in appreciable quantities (over 10%) the words "gravelly" may be added to the class name, viz: "gravelly sand". The terms "trace" and "with" are used to describe sand, silt and gravel, refer to standard grain size limits.

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.



PROFILE
Scale: 1" = 10'

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
SHEET 10 OF 10

DEVORE OVERHEAD

LOG OF TEST BORINGS

SCALE As Noted | BRIDGE 54-818R/L | PM Prel 16.3 | DRAWING 54818-11

Charge: 08205
W.A.: 049111

Disregard prints bearing earlier numbers. → PREL. DRAWING NO. PR- 8826

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

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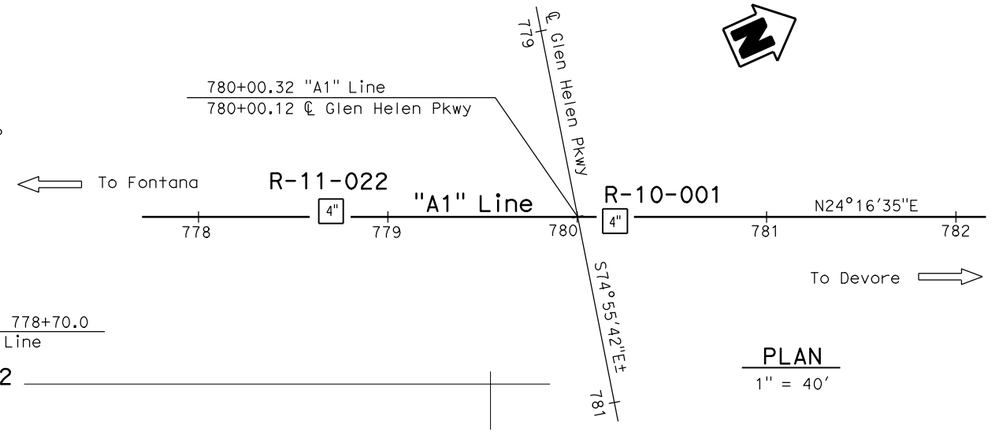
PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

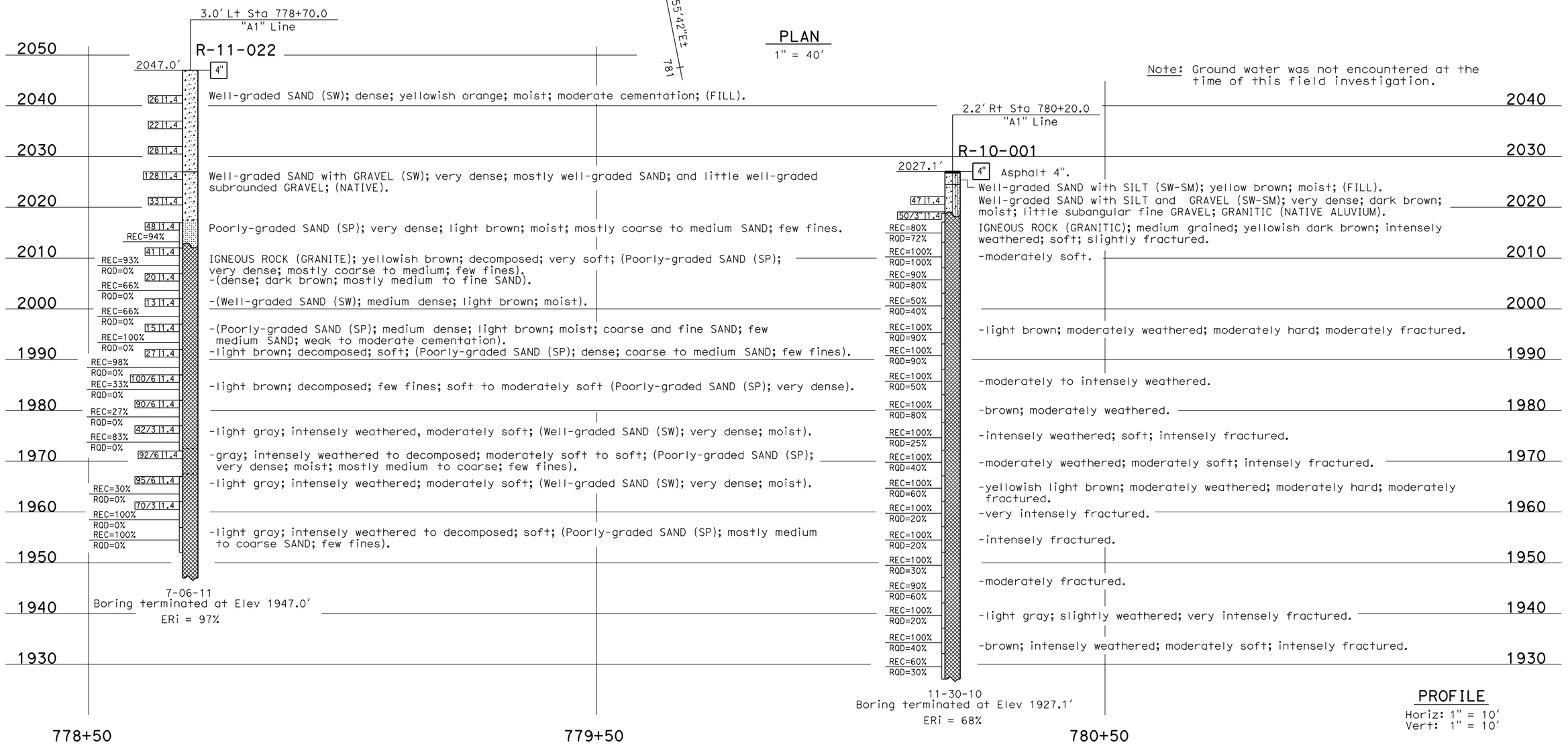
BENCH MARK

PNO 173 2120.910
FD STD Brass disk in concrete stamped "SBD-215-173 1988" 40′ Ely of EOD Devore Rd Bridge at Nly end bridge; 70′ Nly of EP NB SBD 215 at PM 17.3 at top of slope.

PNO 2010 2179.090
FD STD Brass disk in concrete stamped "D8 SCN SBD-15 PM 16.3 08.04.08" At top of slope SOUTH of Connector Bridge from NB SBD 15 to NB SBD 215.



PLAN
1" = 40′



Note: Ground water was not encountered at the time of this field investigation.

PROFILE
Horiz: 1" = 10′
Vert: 1" = 10′

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	GLEN HELEN PARKWAY UC (WIDEN)
FUNCTIONAL SUPERVISOR	DRAWN BY: F. Nguyen 5/11	FIELD INVESTIGATION BY:	DESIGN BRANCH X	54-0779L/R	
NAME: A. Perez-Cobo	CHECKED BY: B. Levine/S. Logeswaran	A. Wardak, D. Cook		POST MILE 14.77	LOG OF TEST BORINGS 1 OF 5

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-30-11	09-23-11	10-19-11	10-24-11	X	X

FILE => glenhelen-pkwy1of5.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:01

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

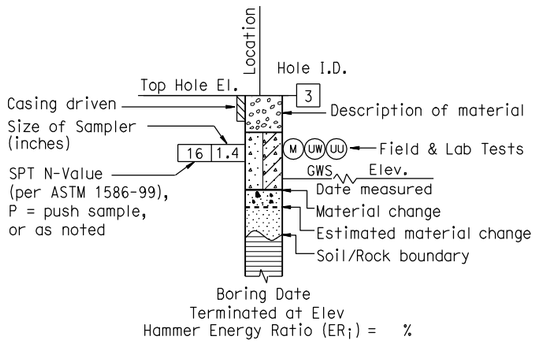
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

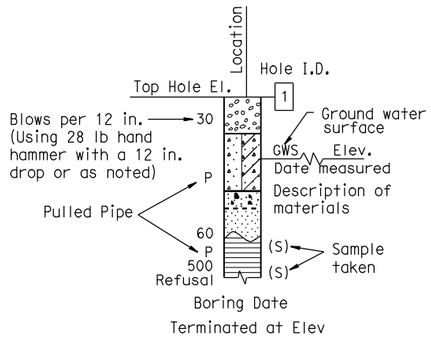
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

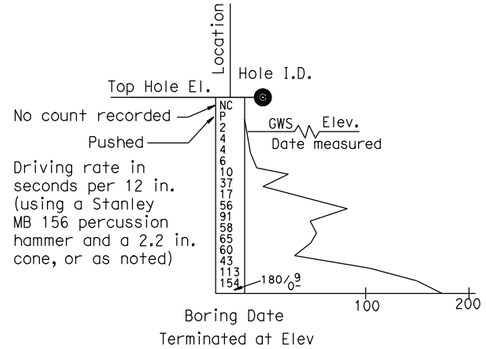
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



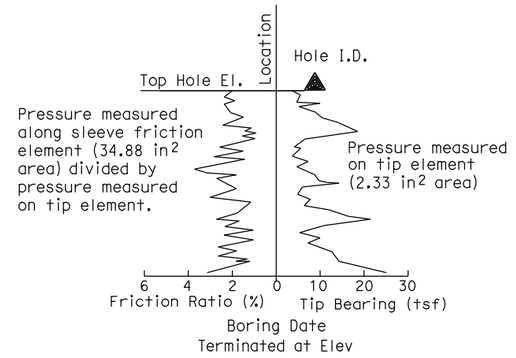
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	GLEN HELEN PARKWAY UC (WIDEN)
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	54-0779L/R POST MILE 14.77	LOG OF TEST BORINGS 2 OF 5

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-30-11				X	X

FILE => glenhelen-pkwy2of5.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:01

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook No. 1391 Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	GLEN HELEN PARKWAY UC (WIDEN)
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	54-0779L/R POST MILE 14.77	LOG OF TEST BORINGS 3 OF 5

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES	SHEET	OF
08-30-11	X	X

FILE => glenhelen-pkwy3of5.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:01

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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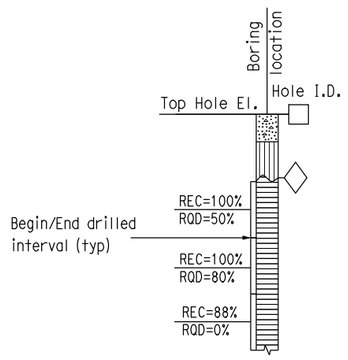
PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

$$REC = \frac{\sum \text{Length of the recovered core pieces (in.)}}{\text{Total length of core run (in.)}} \times 100\%$$

$$RQD = \frac{\sum \text{Length of intact core pieces} \geq 4 \text{ in.}}{\text{Total length of core run (in.)}} \times 100\%$$



RQD* Indicates soundness criteria not met.

BEDDING SPACING

Description	Thickness / Spacing
Massive	Greater than 10 ft
Very Thickly Bedded	3 ft - 10 ft
Thickly Bedded	1 ft - 3 ft
Moderately Bedded	4 in. - 1 ft
Thinly Bedded	1 in. - 4 in.
Very Thinly Bedded	1/4 in. - 1 in.
Laminated	Less than 1/4 in.

LEGEND OF ROCK MATERIALS

- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

ROCK HARDNESS

Description	Criteria
Extremely Hard	Cannot be scratched with a pocketknife or sharp pick. Can only be chipped with repeated heavy hammer blows.
Very Hard	Cannot be scratched with a pocketknife or sharp pick. Breaks with repeated heavy hammer blows.
Hard	Can be scratched with a pocketknife or sharp pick with difficulty (heavy pressure). Breaks with heavy hammer blows.
Moderately Hard	Can be scratched with pocketknife or sharp pick with light or moderate pressure. Breaks with moderate hammer blows.
Moderately Soft	Can be grooved 1/16 in. deep with a pocketknife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Can be grooved or gouged easily by a pocketknife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.
Very Soft	Can be readily indented, grooved or gouged with fingernail, or carved with a pocketknife. Breaks with light manual pressure.

FRACTURE DENSITY

Description	Observed Fracture Density
Unfractured	No fractures.
Very Slightly Fractured	Core lengths greater than 3 ft.
Slightly Fractured	Core lengths mostly from 1 to 3 ft.
Moderately Fractured	Core lengths mostly from 4 in. to 1 ft.
Intensely Fractured	Core lengths mostly from 1 to 4 in.
Very Intensely Fractured	Mostly chips and fragments.

WEATHERING DESCRIPTORS FOR INTACT ROCK

Description	Diagnostic Features					General Characteristics
	Chemical Weathering-Discoloration and/or Oxidation		Mechanical Weathering-Grain Boundary Conditions (Disaggregation) Primarily for Granitics and Some Coarse-Grained Sediments	Texture and Leaching		
	Body of Rock	Fracture Surfaces		Texture	Leaching	
Fresh	No discoloration, not oxidized.	No discoloration or oxidation.	No separation, intact (tight).	No change	No leaching	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull.	Minor to complete discoloration or oxidation of most surfaces.	No visible separation, intact (tight).	Preserved	Minor leaching of some soluble minerals.	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty," feldspar crystals are "cloudy."	All fracture surfaces are discolored or oxidized.	Partial separation of boundaries visible.	Generally preserved	Soluble minerals may be mostly leached.	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in-situ disaggregation, see grain boundary conditions.	All fracture surfaces are discolored or oxidized, surfaces friable.	Partial separation, rock is friable; in semiarid conditions granitics are disaggregated.	Texture altered by chemical disintegration (hydration, argillation).	Leaching of soluble minerals may be complete.	Dull sound when struck with hammer, usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures, or veinlets. Rock is significantly weakened.
Decomposed	Discolored or oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay.		Complete separation of grain boundaries (disaggregated).	Resembles a soil, partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete.		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes."

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	GLEN HELEN PARKWAY UC (WIDEN)
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	54-0779L/R POST MILE 14.77	LOG OF TEST BORINGS 4 OF 5

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES					SHEET	OF
08-30-11					X	X

FILE => glenhelen-pkwy4of5.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:02

DIST.	COUNTY	ROUTE	SECTION	SHEET NO.	TOTAL SHEETS
08	SBd.	31	43.7/46.1	288	594

FED. ROAD DIST. NO.	STATE	F.A. PROJECT No.	SHEET NO.	TOTAL SHEETS
7	CALIF.			

Date Approved: November 30, 1966

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

As-built Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	POST MILE-TOTAL PROJECT	Sheet No.	Total Sheets
08	SBd	15			

CERTIFIED ENGINEERING GEOLOGIST — DATE 10-12-11

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

GLEN HELEN PARKWAY UC (WIDEN)
LOG OF TEST BORINGS 5 OF 5

UNIT: 3643	CONTRACT No.	BRIDGE No.
PROJECT NUMBER & PHASE: 08000003660	08-0K7100	54-0779L/R

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA — Sheet ___ of ___

BENCH MARK

P.K. P.I.9 Elev. 1993.33
Bothey Stake & Cap in conc. Bur 1.9'
250' Rt. Sta. 785+60.4 ℄ Imp. Rte. 31

℄ DEVORE ROAD

B-1 B-2 B-3 B-4 B-5

℄ IMP. RTE. 31

787 788 789

N 256, 237. 714
E 177, 032. 181

788 (RELOCATED)

AS BUILT PLANS
Contract No. 08-049114
Date Completed 11-10-69
Document No. 8000217

Note: All 4" Soil Tube Borings (COBRA) were driven with closed tip. Blows per ft. using 28 lb. drop hammer with 12" free fall

PLAN
Scale: 1" = 20'

PROFILE
Scales 1" = 10'

Approx. existing ground line along ℄ IMP. RTE. 31

B-4 Sta. 788+46 ℄ IMP. RTE. 31 — 2038 — Class 1 3-3-65 — 150/0.1'

B-5 Sta. 788+30 ℄ IMP. RTE. 31 — 2038 — Blows per ft. — 150/0.1' — 11-8-65

B-3 — 2028 — 140/0.1' — 11-8-65

B-4 — 2012 — 150/0.1' — 10-27-65

B-2 — 2001 — 150/0.1' — 10-22-65

Slightly compact, brown, fine to medium sand with 10% silt binder.

Loose, brown, clean, fine to medium sand.

Slightly compact, light brown, micaceous, fine to medium sand.

Slightly compact, yellow-brown sand with silt binder.

Dense to very dense, yellow-brown, decomposed quartz diorite.

NO GROUND WATER ENCOUNTERED DURING THIS INVESTIGATION BY BRIDGE DEPT. GEOLOGY SECTION DATE 11-3-65

2070 2060 2050 2040 2030 2020 2010 2000 1990 1980 1970

787 788 789

AS BUILT
CORRECTIONS BY
CONTRACT NO.
DATE

LEGEND OF DRILLING OPERATIONS

Penetrometer; 2½" Cone Penetrometer; Sampler Boring (Dry); Rotary Boring (Wet); Auger Boring (Dry); Jet Boring; Core Boring; Test Pit; Test Hole El. Flush; Test Hole El. Flush (Dry); Test Hole El. Flush (Wet); Standard Penetration Boring; 1" Soil Tube

LEGEND OF EARTH MATERIALS

Gravel; Sand; Silt; Clay; Sandy Clay or Clayey Sand; Sandy Silt or Silty Sand; Silty Clay or Clayey Silt; Peat Mixed Organic Matter; Fill Material; Igneous Rock; Sedimentary Rock; Metamorphic Rock

CLASSIFICATION OF MATERIALS BASED ON STANDARD GRADE SIZE LIMITS

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

FIELD STUDY	C. MIKES 11-3-65
DRAWN	T. CHOU 12-65
CHECKED	P. C. MORRIS 12-65
SUPV. ENGINEER	Robert Ward

BRIDGE DEPARTMENT
ENGINEERING GEOLOGY SECTION

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

SHEET 8 OF 8

DEVORE ROAD UNDERCROSSING

LOG OF TEST BORINGS

SCALE As Noted | BRIDGE 54-779R/L | PM 45.1 Rte | DRAWING 54779-8

Disregard prints bearing earlier numbers → PREL. DRAWING NO. PR- 396 286

Charge: 08203

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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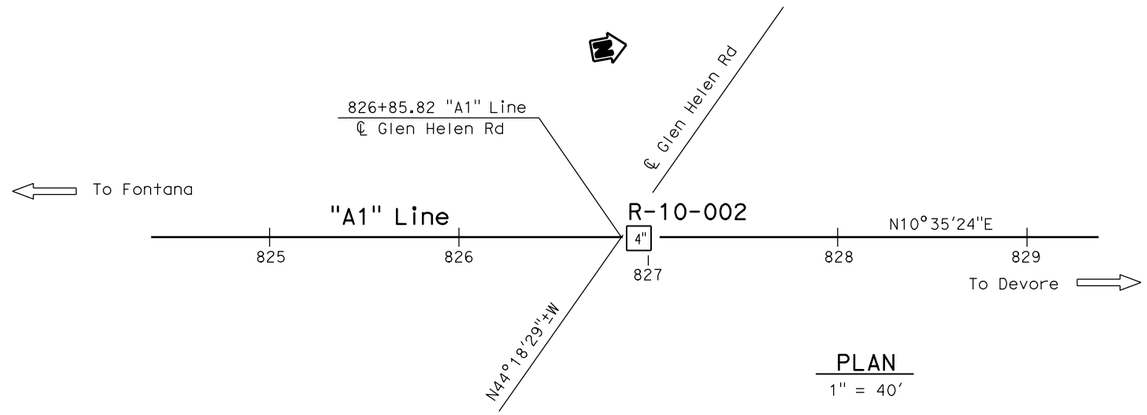
This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

BENCH MARK

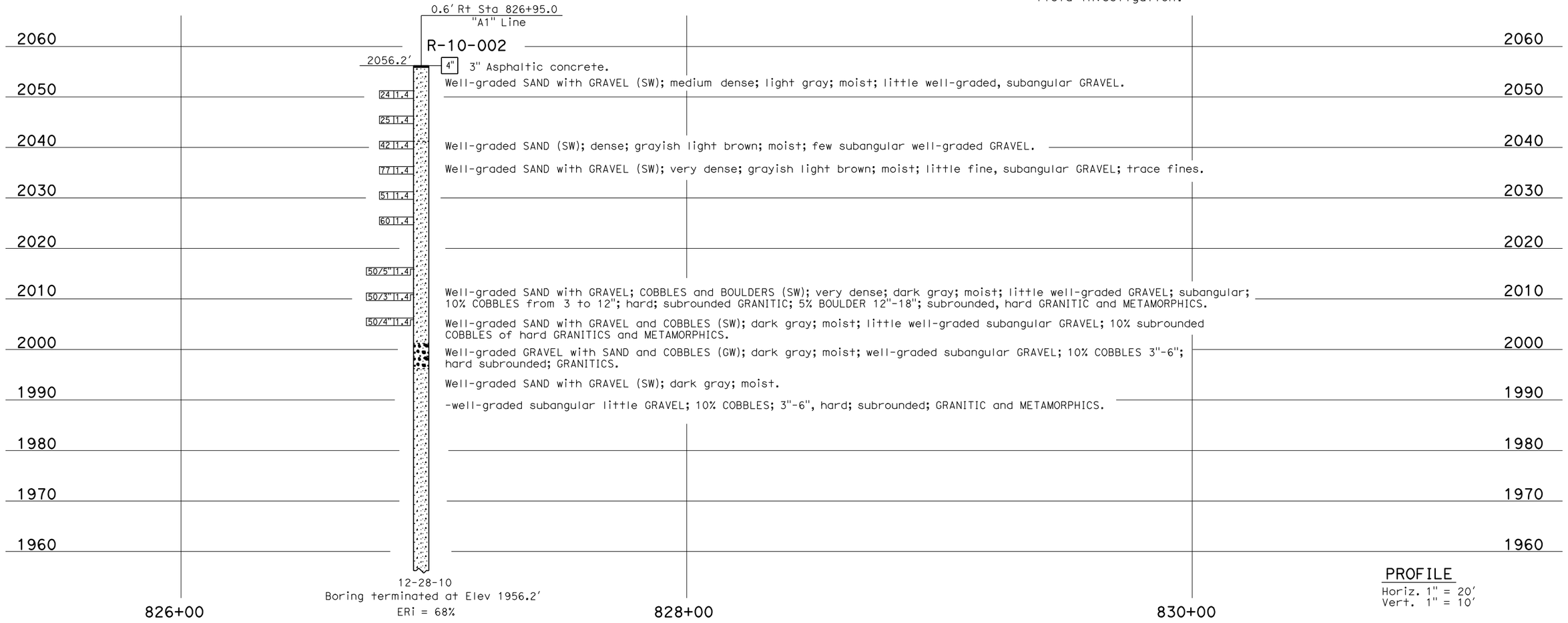
PNO 173 2120.910
FD STD Brass disk in concrete stamped "SBD-215-173 1988" 40′ Ely of EOD Devore Rd Bridge at Nly end bridge; 70′ Nly of EP NB SBD 215 at PM 17.3 at top of slope.

PNO 2010 2179.090
FD STD Brass disk in concrete stamped "D8 SCN SBD-15 PM 16.3 08.04.08" At top of slope SOUTH of Connector Bridge from NB SBD 15 to NB SBD 215.



PLAN
1" = 40′

Note: No ground water encountered during field investigation.



12-28-10
Boring terminated at Elev 1956.2′
ERi = 68%

PROFILE
Horiz. 1" = 20′
Vert. 1" = 10′

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	GLEN HELEN RD UC (WIDEN)
FUNCTIONAL SUPERVISOR	DRAWN BY: F. Nguyen 5/11		DESIGN BRANCH X	54-0780L/R	LOG OF TEST BORINGS 1 OF 4
NAME: A. Perez-Cobo	CHECKED BY: B. Levine/S. Logeswaran	FIELD INVESTIGATION BY: C. Hoadley, F. Qmehr		POST MILE 15.66	

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-26-11	10-03-11			X	X

FILE => glenhelen-rd1of4.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 13:22

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST
K. Douglas Cook
No. 1391
Exp. 12-31-11
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PLANS APPROVAL DATE

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

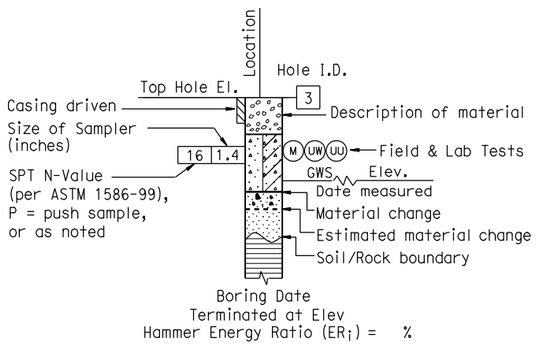
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

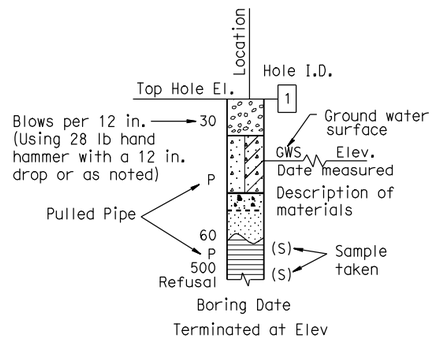
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

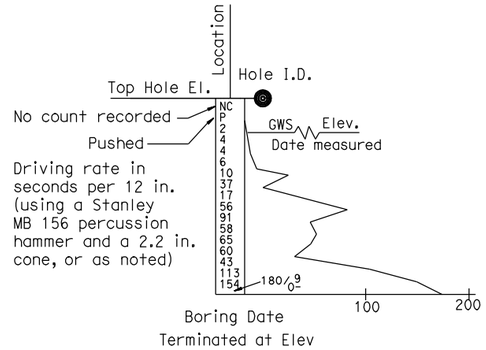
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



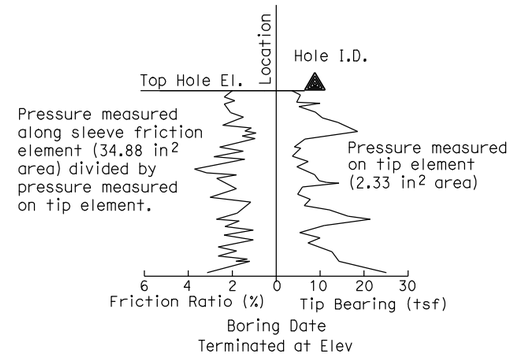
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	GLEN HELEN RC UC (WIDEN)
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	54-0780L/R POST MILE 15.66	LOG OF TEST BORINGS 2 OF 4

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-26-11				X	X

FILE => glenhelen-rd2of4.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 13:22

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	GLEN HELEN RC UC (WIDEN)
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	54-0780L/R POST MILE 15.66	LOG OF TEST BORINGS 3 OF 4

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-26-11				X	X

FILE => glenhelen-rd3of4.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 13:22

FED. ROAD DIST. NO.	STATE	F. A. PROJECT No.	SHEET No.	TOTAL SHEETS
7	CALIF.			

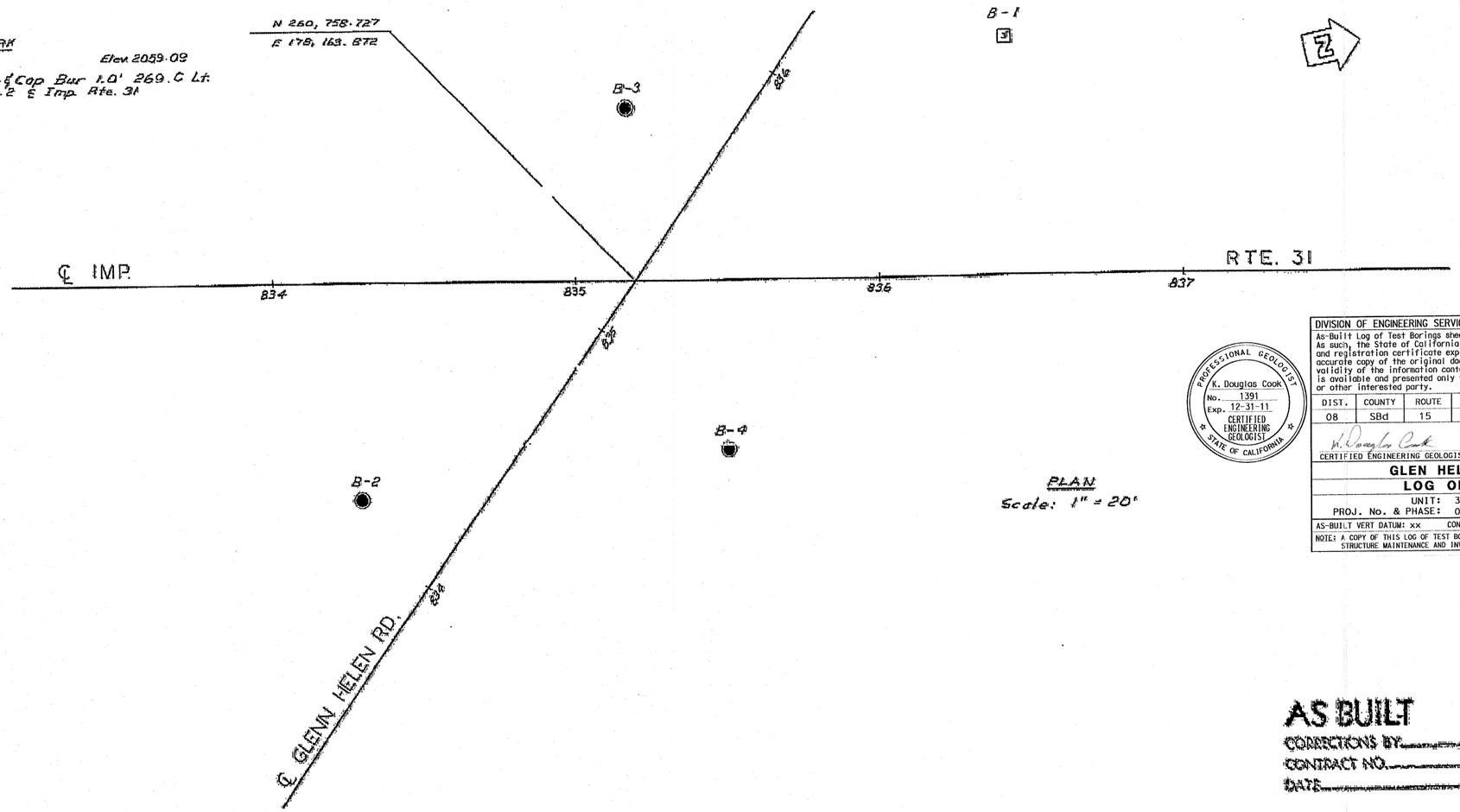
DIST.	COUNTY	ROUTE	SECTION	SHEET No.	TOTAL SHEETS
08	SBd.	31	19A/27	246	338

BRIDGE ENGINEER — CIVIL ENGINEER — LICENSE EXPIRES

DATE APPROVED November 28, 1966

BENCH MARK
BM R-4 PI-14 Elev. 2059.09
Bathey Stake & Cap Bur 1.0' 269.C Lt.
Sta. 636 + 73.2 ℄ Imp. Rte. 31

N 260, 758.727
E 178, 163.872



PLAN
Scale: 1" = 20'

PROFESSIONAL GEOLOGIST
K. Douglas Cook
No. 1391
Exp. 12-31-11
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

As-Built Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	POST MILE-TOTAL PROJECT	Sheet No.	Total Sheets
08	SBd	15			

K. Douglas Cook — 10-12-11
CERTIFIED ENGINEERING GEOLOGIST — DATE

GLEN HELEN RD UC (WIDEN)
LOG OF TEST BORINGS 4 OF 4

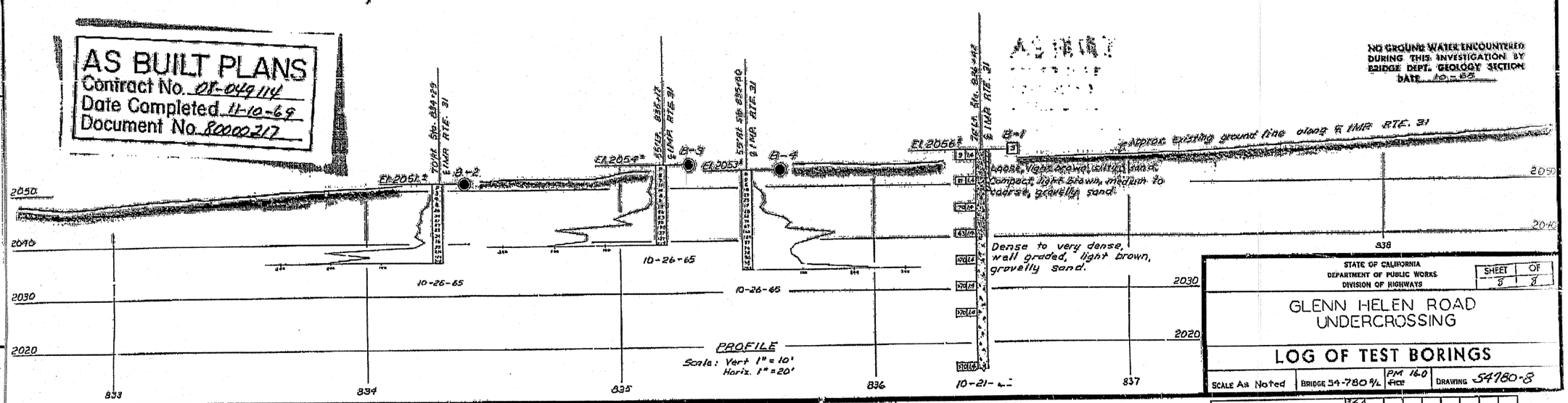
UNIT: 3643	CONTRACT No.	BRIDGE No.
PROJ. No. & PHASE: 08000003660	08-0K7100	54-0780L/R
AS-BUILT VERT DATUM: xx CONVERSION: xx		Sheet of

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

AS BUILT
CORRECTIONS BY
CONTRACT NO.
DATE

AS BUILT PLANS
Contract No. 08-049114
Date Completed 11-10-69
Document No. 80000217

NO GROUND WATER ENCOUNTERED DURING THIS INVESTIGATION BY BRIDGE DEPT. GEOLOGY SECTION
DATE 10-85



PROFILE
Scale: Vert 1" = 10'
Horiz. 1" = 20'

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
SHEET 8 OF 8

GLENN HELEN ROAD
UNDERCROSSING

LOG OF TEST BORINGS

SCALE As Noted | BRIDGE 54-780 L/R | PM 16.0 R16.8 | DRAWING 54780-8

Charge: 08205
WA : 049111

Disregard prints bearing earlier numbers →

PREL. DRAWING No. PR- 36/26

LEGEND OF BORINGS OPERATIONS

PENETROMETER
2½" CORE PENETROMETER
SAMPLER BORING (DRY)
ROTARY BORING (WET)
AUGER BORING (DRY)
JET BORING
CORE BORING
TEST PIT

LEGEND OF EARTH MATERIALS

GRAVEL — SILTY CLAY OR CLAYEY SILT
SAND — ORGANIC MATTER
SILT — FILL MATERIAL
CLAY — IGNEOUS ROCK
SANDY CLAY OR CLAYEY SAND — SEDIMENTARY ROCK
SANDY SILT OR SILTY SAND — METAMORPHIC ROCK

CLASSIFICATION OF MATERIAL BASED ON STANDARD GRADE SIZE LIMITS

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

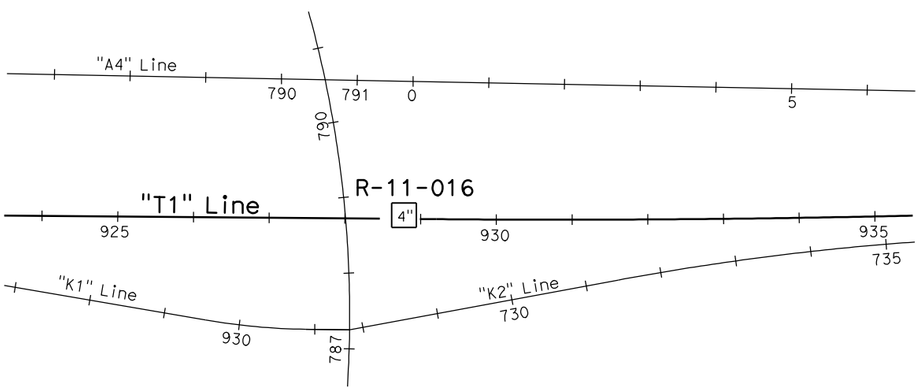
BRIDGE DEPARTMENT
ENGINEERING GEOLOGY SECTION

CHECK PRINT
by _____

BENCH MARK

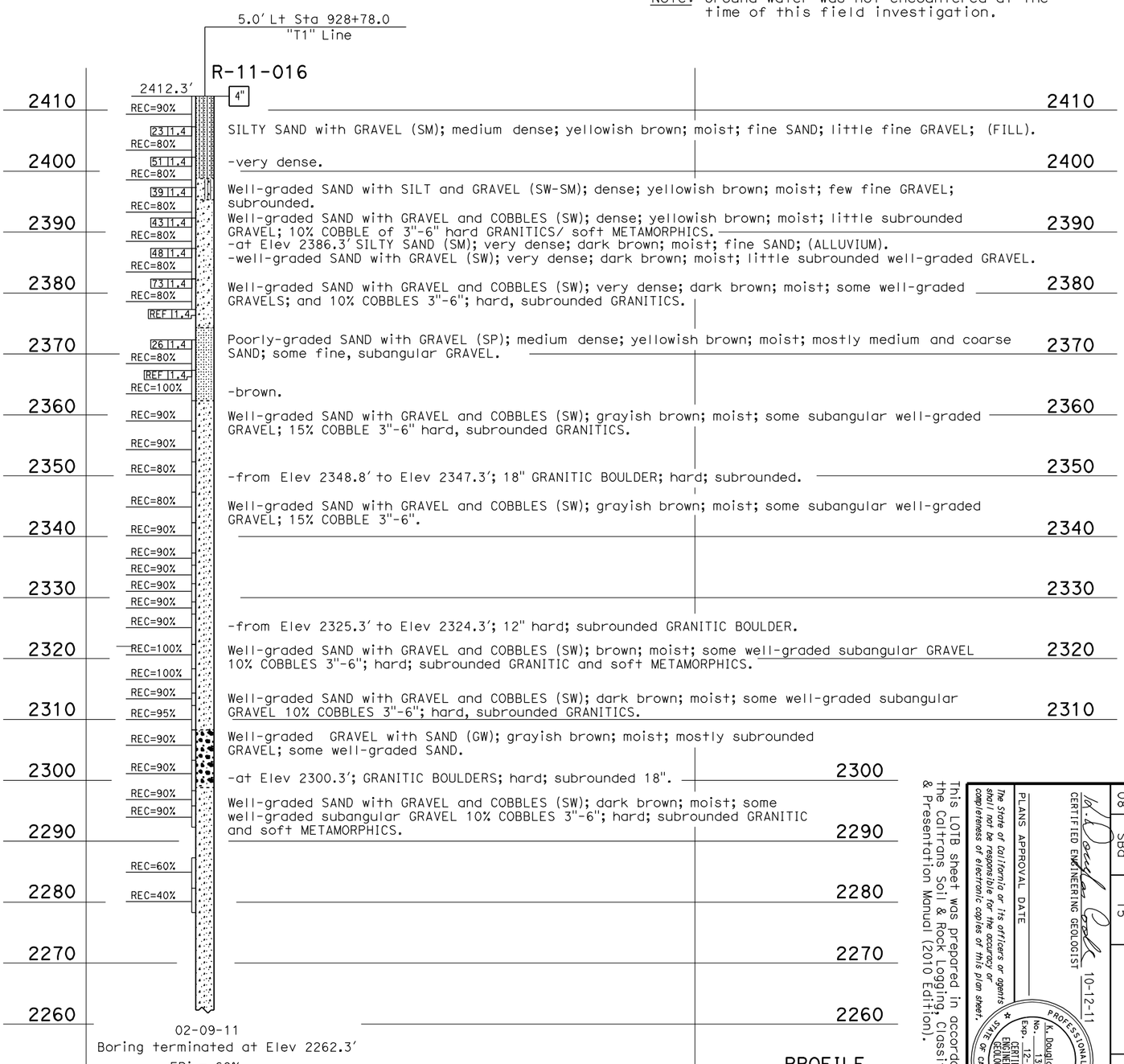
PNO 173 2120.910
FD STD Brass disk in concrete stamped "SBD-215-173 1988" 40′ Ely of EOD Devore Rd Bridge at Nly end bridge; 70′ Nly of EP NB SBD 215 at PM 17.3 at top of slope.

PNO 2010 2179.090
FD STD Brass disk in concrete stamped "D8 SCN SBD-15 PM 16.3 08.04.08" At top of slope SOUTH of Connector Bridge from NB SBD 15 to NB SBD 215.



PLAN
1" = 100′

Note: Ground water was not encountered at the time of this field investigation.



PROFILE
Horiz: 1" = 40′
Vert: 1" = 10′

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

W. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

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.

PROFESSIONAL GEOLOGIST
W. Douglas Cook
No. 1391
Exp. 12-31-11
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
08	SBd	15			

ENGINEERING SERVICES
MATERIALS AND GEOTECHNICAL SERVICES

FUNCTIONAL SUPERVISOR
NAME: A. Perez-Cobo

DRAWN BY: F. Nguyen 6/11
CHECKED BY: B. Levine/S. Logeswaran

FIELD INVESTIGATION BY:
D. Cook

DOS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES
FOR REDUCED PLANS

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH X

BRIDGE NO.
NEW
POST MILE
R14.96

UNIT: 3643
PROJECT NUMBER & PHASE: 0800000003660
CONTRACT NO.: 08-0K7100

NB I-15 TRUCK BYPASS
LOG OF TEST BORINGS 1 OF 5

DISREGARD PRINTS BEARING EARLIER REVISION DATES

SHEET	REVISION DATES
X	10-9-11
X	

FILE => nb15truckbypass1of5.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 13:31

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

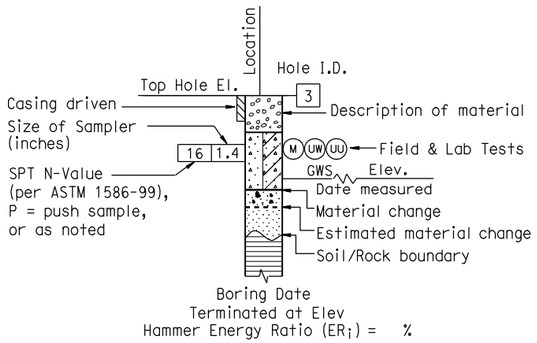
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

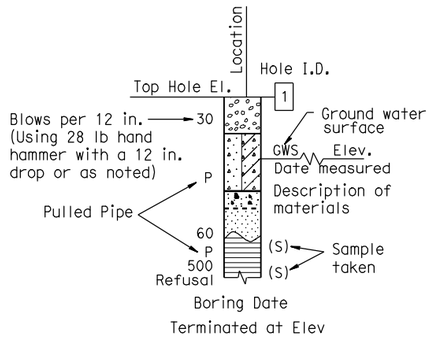
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

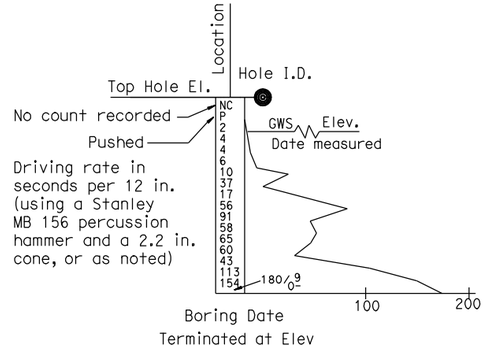
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



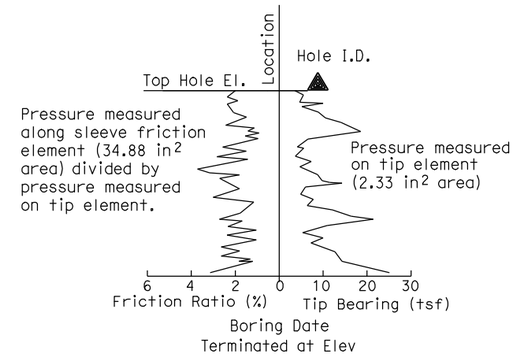
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	NB I-15 TRUCK BYPASS
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	NEW POST MILE R14.36	LOG OF TEST BORINGS 2 OF 5

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES			SHEET	OF
~~08-25-11~~	10-05-11		X	X

FILE => nb15truckbypass2of5.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 13:31

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	NB I-15 TRUCK BYPASS
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	NEW	LOG OF TEST BORINGS 3 OF 5
				POST MILE R14.36	

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-05-11	10-05-11			X	X

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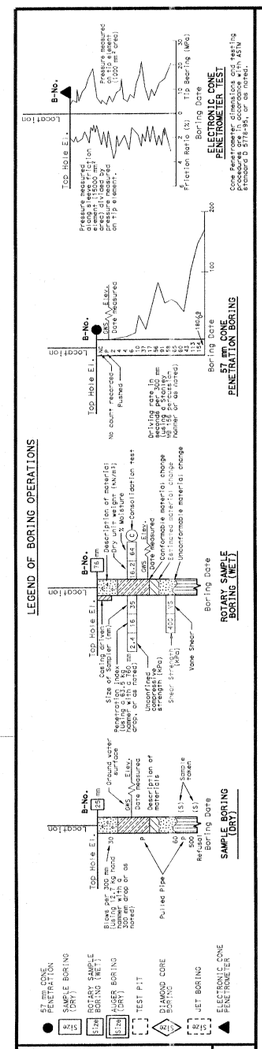
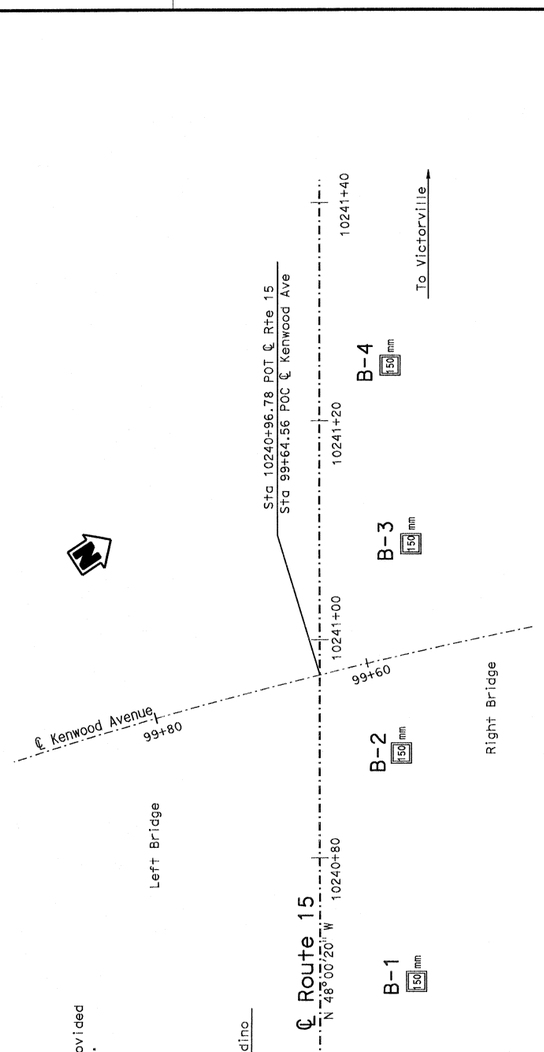
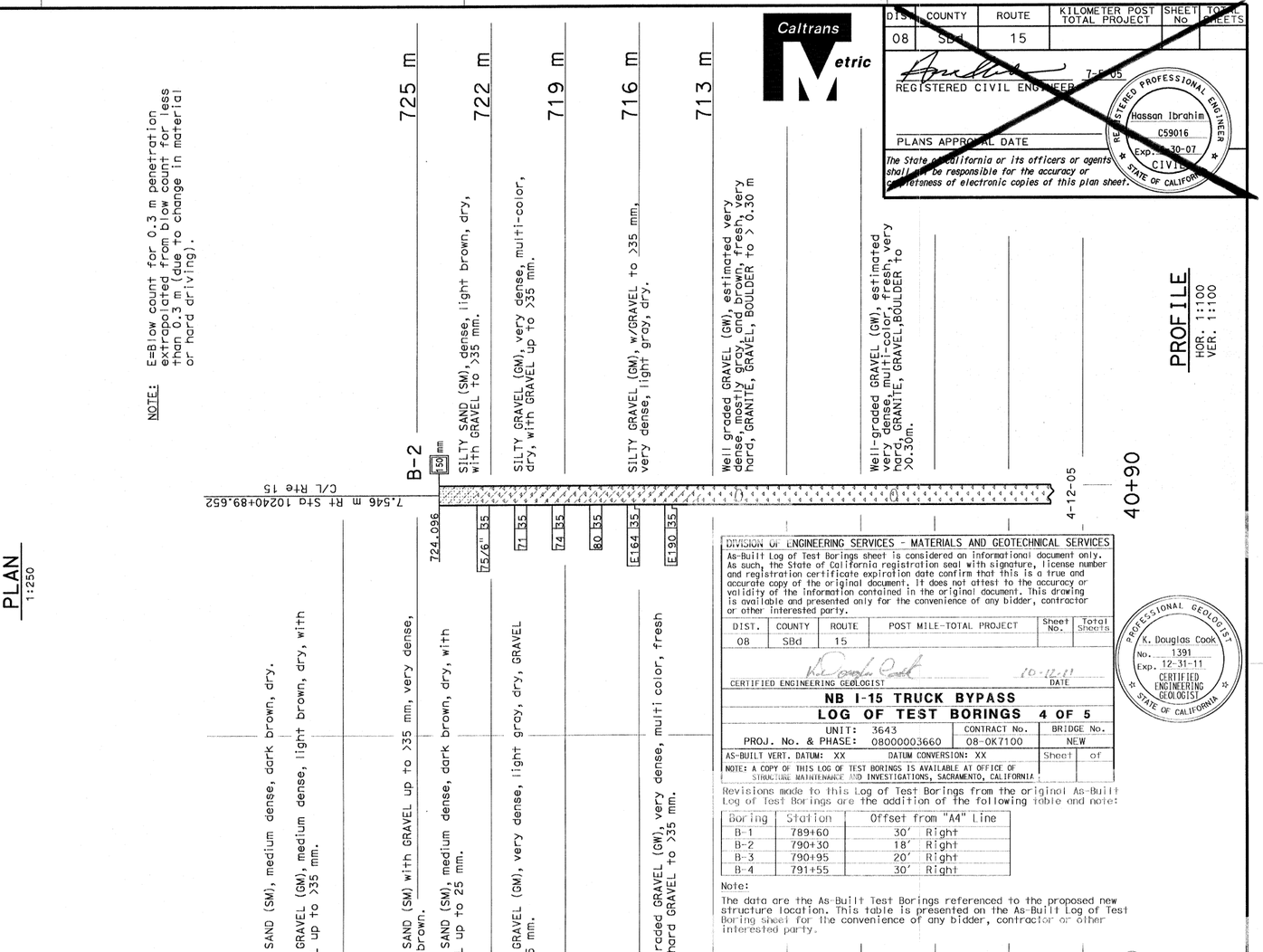




NOTE: E=Blow count for 0.3 m penetration extrapolated from blow count for less than 0.3 m (due to change in material or hard driving).



Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15			

REGISTERED CIVIL ENGINEER — 7-5-05

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Hassan Ibrahim — C59016 — Exp. 6-30-07 — CIVIL — STATE OF CALIFORNIA

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DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

As-Built Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	POST MILE-TOTAL PROJECT	Sheet No.	Total Sheets
08	SBd	15			

CERTIFIED ENGINEERING GEOLOGIST — 10-12-11 DATE

K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

NB I-15 TRUCK BYPASS

LOG OF TEST BORINGS 4 OF 5

UNIT: 3643	CONTRACT No.	BRIDGE No.
PROJ. No. & PHASE: 08000003660	08-0K7100	NEW

AS-BUILT VERT. DATUM: XX — DATUM CONVERSION: XX — Sheet — of

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

Revisions made to this Log of Test Borings from the original As-Built Log of Test Borings are the addition of the following table and note:

Boring	Station	Offset from "A4" Line
B-1	789+60	30' Right
B-2	790+30	18' Right
B-3	790+95	20' Right
B-4	791+55	30' Right

Note:

The data are the As-Built Test Borings referenced to the proposed new structure location. This table is presented on the As-Built Log of Test Boring Sheet for the convenience of any bidder, contractor or other interested party.

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

ENGINEERING SERVICES	GEOTECHNICAL SERVICES
DRAWN BY	W. Tang 05/05
CHECKED BY	H. Ibrahim

FIELD INVESTIGATION BY: H. Ibrahim

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF STRUCTURES
STRUCTURE DESIGN

CU 08
EA 0A4231

BRIDGE NO.	54-0772
KILOMETER POST	24.08

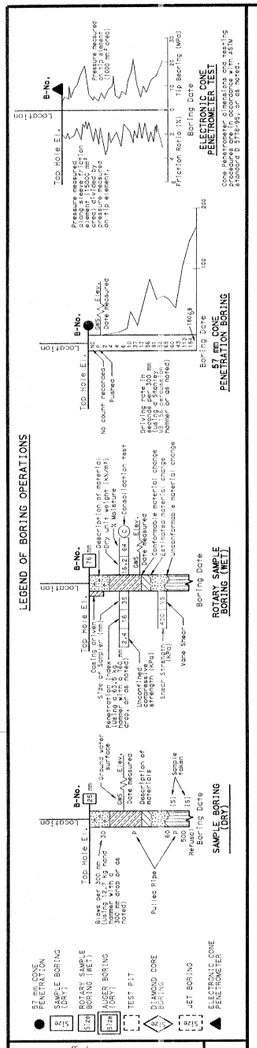
KENWOOD AVENUE UC
LOG OF TEST BORINGS 1 OF 2

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

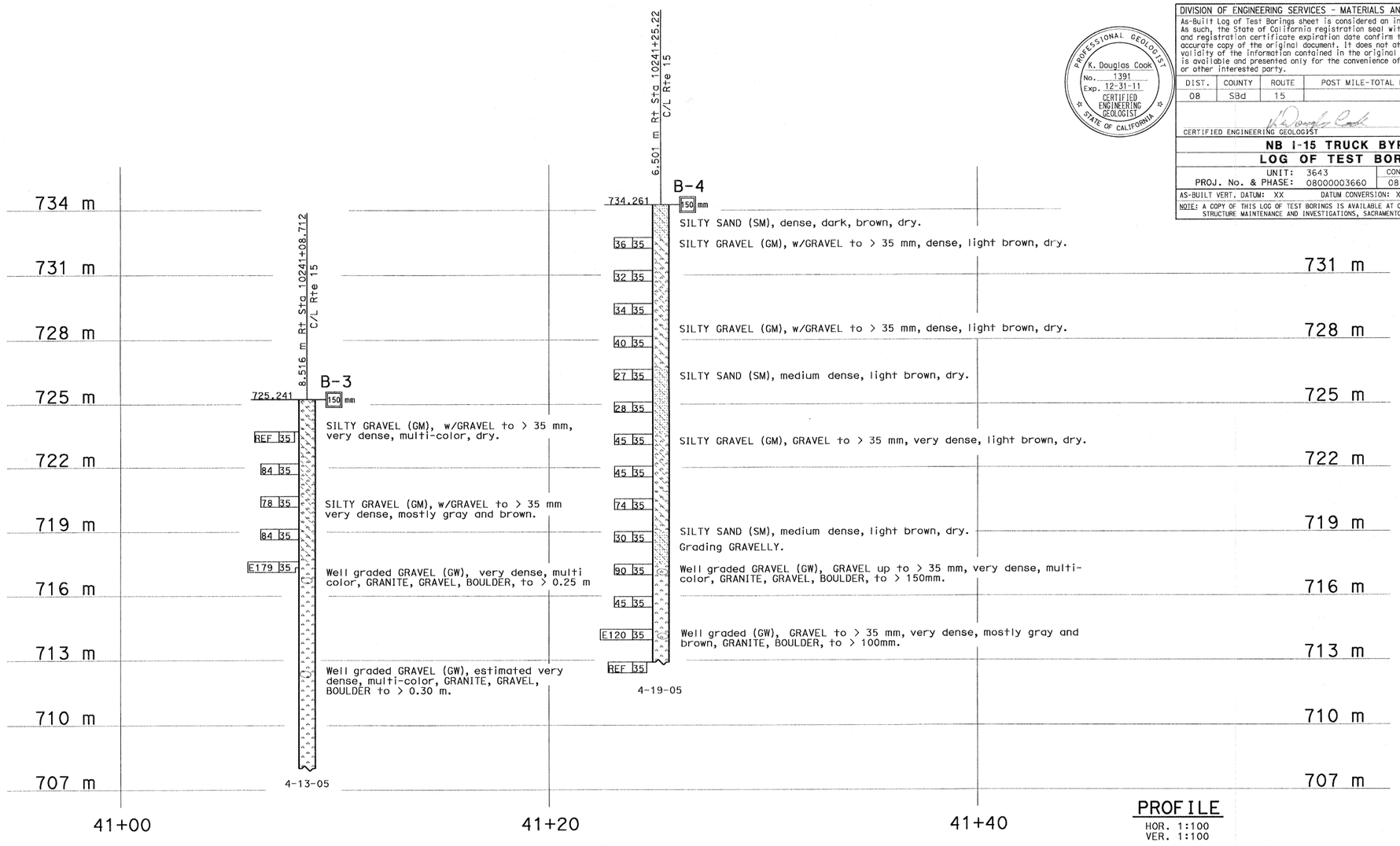
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY): 7-5-05 — SHEET — OF

OGS CIVIL LOG OF TEST BORINGS SHEET (METRIC) (REV. 4/04)



FOR PLAN VIEW, SEE
"LOG OF TEST BORINGS" 1 OF 2



PROFILE
HOR. 1:100
VER. 1:100

ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SHOWN

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

REGISTERED CIVIL ENGINEER — 7-5-05

REGISTERED PROFESSIONAL ENGINEER — Hassan Ibrahim — C59016 — Exp. 6-30-07 — CIVIL — STATE OF CALIFORNIA

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PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	POST MILE-TOTAL PROJECT	Sheet No.	Total Sheets
08	SBd	15			

K. Douglas Cook — 10-12-11
CERTIFIED ENGINEERING GEOLOGIST — DATE

NB I-15 TRUCK BYPASS

LOG OF TEST BORINGS 5 OF 5

UNIT: 3643	CONTRACT No.	BRIDGE No.
PROJ. No. & PHASE: 08000003660	08-0K7100	NEW
AS-BUILT VERT. DATUM: XX	DATUM CONVERSION: XX	Sheet / of

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

ENGINEERING SERVICES	GEOTECHNICAL SERVICES
DRAWN BY	W. Tang 05/05
CHECKED BY	H. Ibrahim

FIELD INVESTIGATION BY: H. Ibrahim

STATE OF **CALIFORNIA** DEPARTMENT OF TRANSPORTATION

DIVISION OF STRUCTURES
STRUCTURE DESIGN

BRIDGE NO.	54-0772
KILOMETER POST	24.08

KENWOOD AVENUE UC

LOG OF TEST BORINGS 2 OF 2

OGS CIVIL LOG OF TEST BORINGS SHEET (METRIC) (REV. 4/04)

ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

CU 08
EA 0A4231

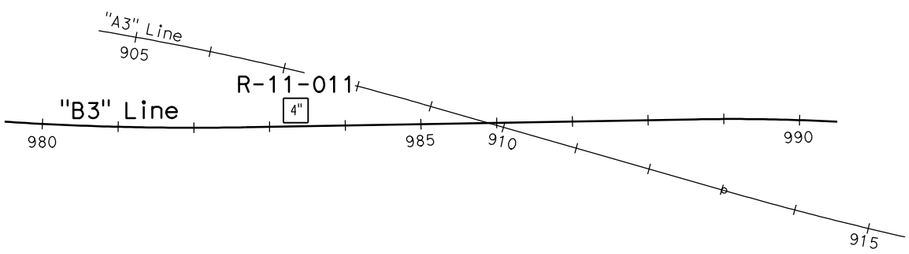
DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES (PRELIMINARY STAGE ONLY) — 7-5-05 — SHEET — OF

BENCH MARK

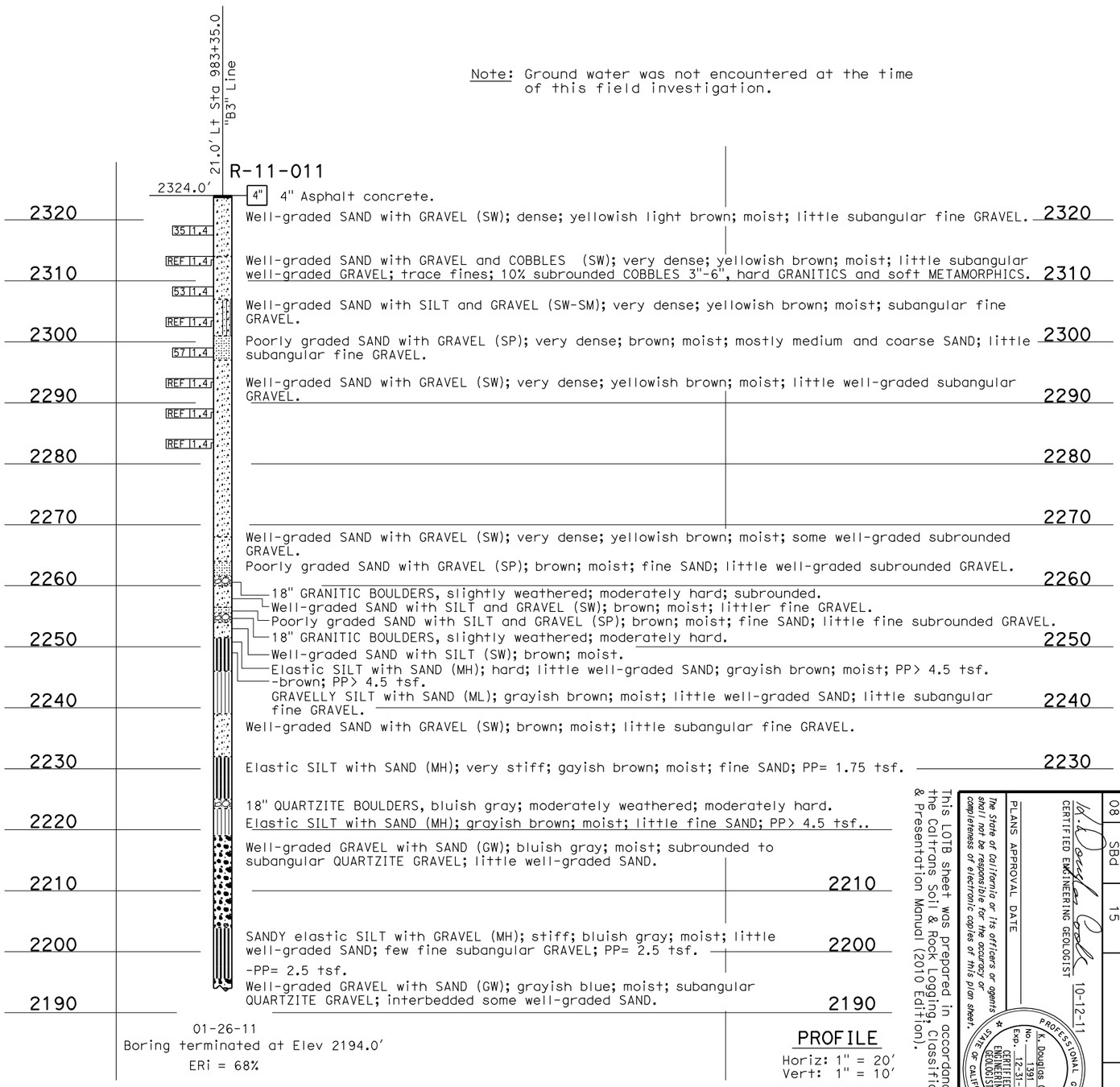
PNO 173 2120.910
FD STD Brass disk in concrete stamped "SBD-215-173 1988" 40′ Ely of EOD Devore Rd Bridge at Nly end bridge; 70′ Nly of EP NB SBD 215 at PM 17.3 at top of slope.

PNO 2010 2179.090
FD STD Brass disk in concrete stamped "D8 SCN SBD-15 PM 16.3 08.04.08" At top of slope SOUTH of Connector Bridge from NB SBD 15 to NB SBD 215.



PLAN
1" = 100′

Note: Ground water was not encountered at the time of this field investigation.



PROFILE
Horiz: 1" = 20′
Vert: 1" = 10′

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

W. Douglas Cook
CERTIFIED ENGINEERING GEOLOGIST
10-12-11

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W. Douglas Cook
No. 1391
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STATE OF CALIFORNIA

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
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ENGINEERING SERVICES
MATERIALS AND GEOTECHNICAL SERVICES

FUNCTIONAL SUPERVISOR
NAME: A. Perez-Cobo

DRAWN BY: F. Nguyen 6/11
CHECKED BY: B. Levine/S. Logeswaran

FIELD INVESTIGATION BY:
D. Cook

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH X

BRIDGE NO.: NEW
POST MILE: R14.64

NEW SB 215 CONNECTOR
LOG OF TEST BORINGS 1 OF 3

REVISION DATES	SHEET	OF
09-26-11 10-03-11	X	X

DISREGARD PRINTS BEARING EARLIER REVISION DATES

UNIT: 3643
PROJECT NUMBER & PHASE: 0800000003660
CONTRACT NO.: 08-0K7100

DGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES
FOR REDUCED PLANS

FILE => new-sb215conn1of3.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:45

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
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Size	R	Rotary drilled diamond core
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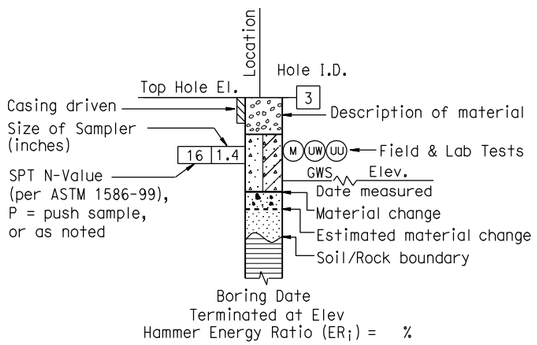
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

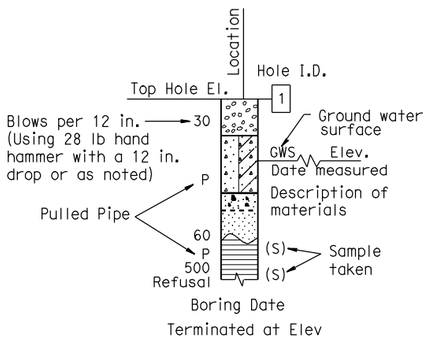
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

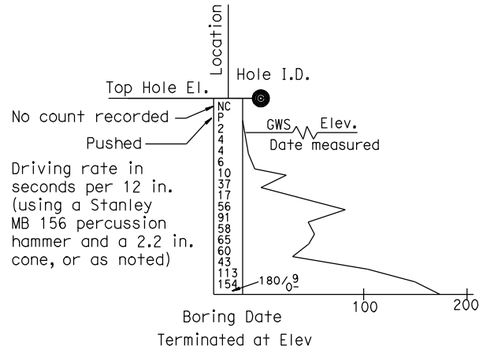
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



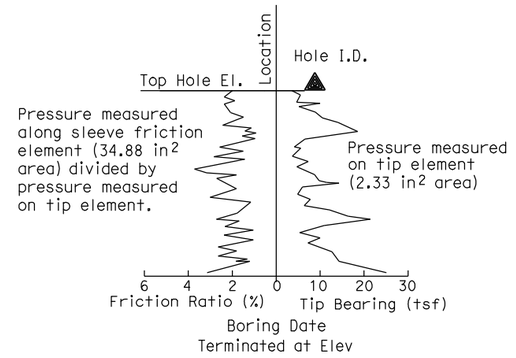
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	NEW SB 215 CONNECTOR
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	NEW POST MILE R14.64	LOG OF TEST BORINGS 2 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-26-11				X	X

FILE => new-sb215conn2of3.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:45

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly-graded GRAVEL Poorly-graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly-graded GRAVEL with SILT Poorly-graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly-graded GRAVEL with CLAY (or SILTY CLAY) Poorly-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly-graded SAND Poorly-graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly-graded SAND with SILT Poorly-graded SAND with SILT and GRAVEL		
SP-SC	Poorly-graded SAND with CLAY (or SILTY CLAY) Poorly-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook No. 1391 Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — 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.

APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 in.)
Very Loose	0 - 5
Loose	5 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	Greater than 50

MOISTURE

Description	Criteria
Dry	No discernable moisture
Moist	Moisture present, but no free water
Wet	Visible free water

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5% - 10%
Little	15% - 25%
Some	30% - 45%
Mostly	50% - 100%

PARTICLE SIZE

Description		Size (in.)
Boulder		Greater than 12
Cobble		3 - 12
Gravel	Coarse	3/4 - 3
	Fine	1/5 - 3/4
Sand	Coarse	1/16 - 1/5
	Medium	1/64 - 1/16
	Fine	1/300 - 1/64
Silt and Clay		Less than 1/300

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH X	BRIDGE NO. NEW / POST MILE R14.64	NEW SB 215 CONNECTOR LOG OF TEST BORINGS 3 OF 3
	PREPARED BY: F. Nguyen 6/11				

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES	SHEET	OF
08-26-11	X	X

FILE => new-sb215conn3of3.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:45

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST
K. Douglas Cook
No. 1391
Exp. 12-31-11
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

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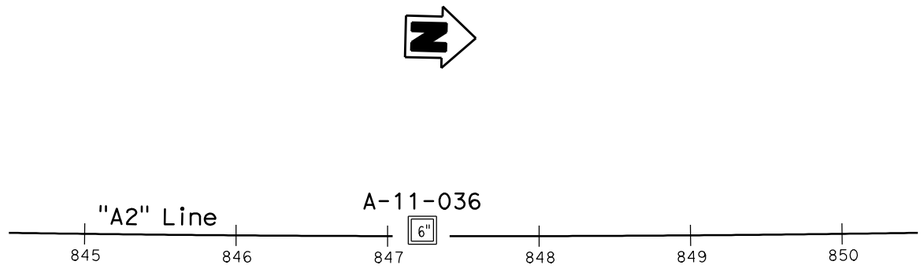
This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

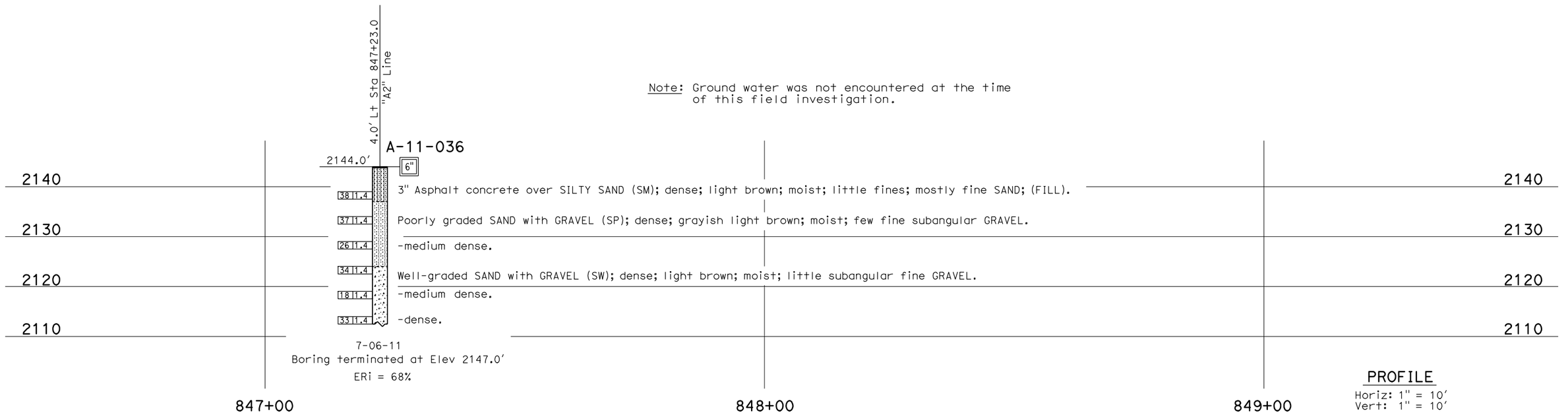
BENCH MARK

Set TBM SEC of Bridge 54-0781R
103.0′ Rt Sta 847+50.0 "A2" Line
at assumed Elev 2144.0 ft (Topo).
NAVD 1988.



PLAN
1" = 50′

Note: Ground water was not encountered at the time of this field investigation.



PROFILE
Horiz: 1" = 10′
Vert: 1" = 10′

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	NEW SIGN POST NB I-15 AT 16.0
FUNCTIONAL SUPERVISOR NAME: A. Perez-Cobo	DRAWN BY: F. Nguyen 9/11 CHECKED BY: B. Levine	FIELD INVESTIGATION BY: D. Cook	DESIGN BRANCH X	NEW POST MILE 16.0	LOG OF TEST BORINGS 1 OF 3

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
~~09-26-11~~	10-19-11			X	X

FILE => newsgnpst-1of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:09

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

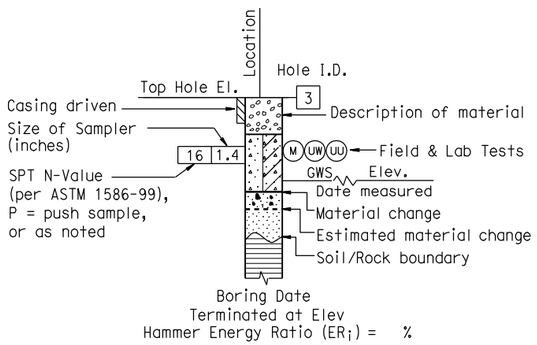
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

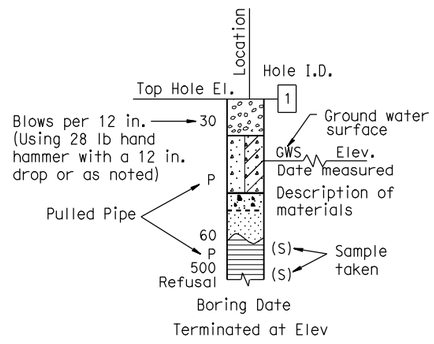
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

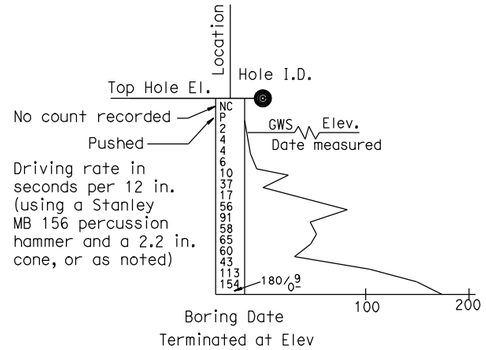
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



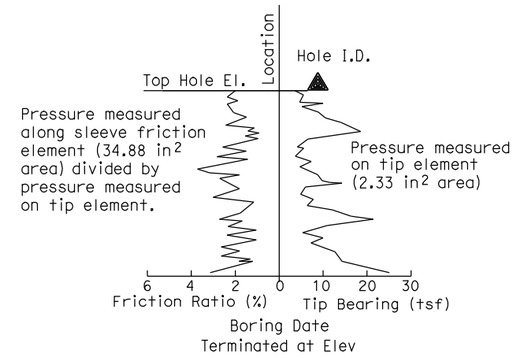
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	NEW SIGN POST NB I-15 AT 16.0
	PREPARED BY: F. Nguyen 9/11		DESIGN BRANCH X	NEW POST MILE 16.0	LOG OF TEST BORINGS 2 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
10-19-11				X	X

FILE => newsgnpst-2of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:09

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	NEW SIGN POST NB I-15 AT 16.0
	PREPARED BY: F. Nguyen 9/11		DESIGN BRANCH X	NEW POST MILE 16.0	LOG OF TEST BORINGS 3 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
10-19-11				X	X

FILE => newsgnpst-3of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:10

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	215			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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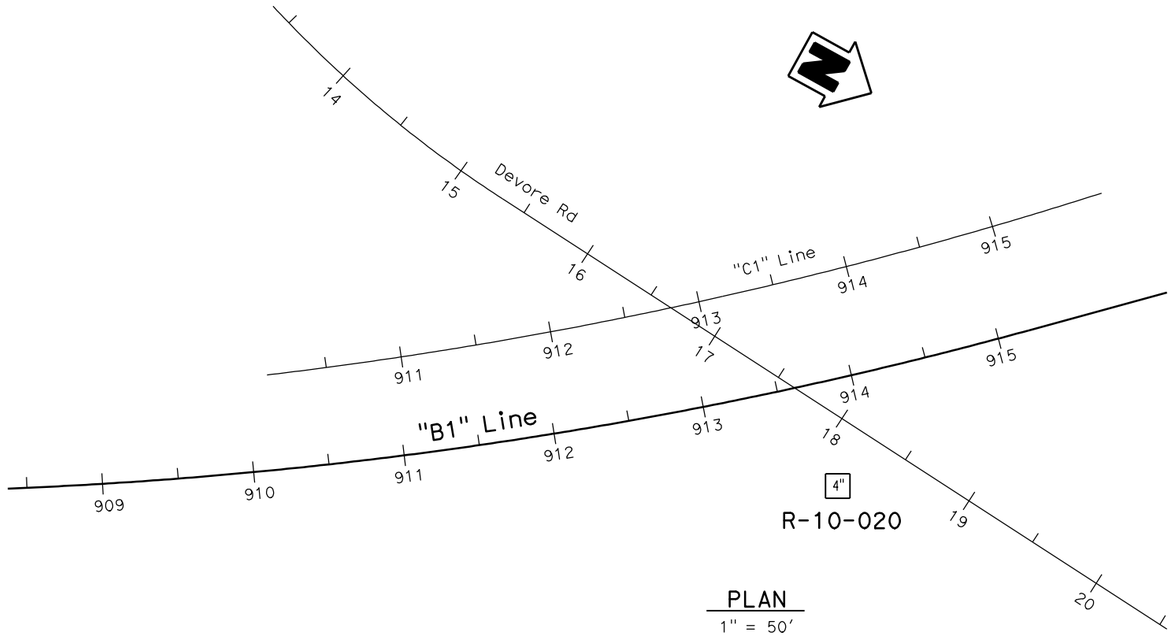
This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

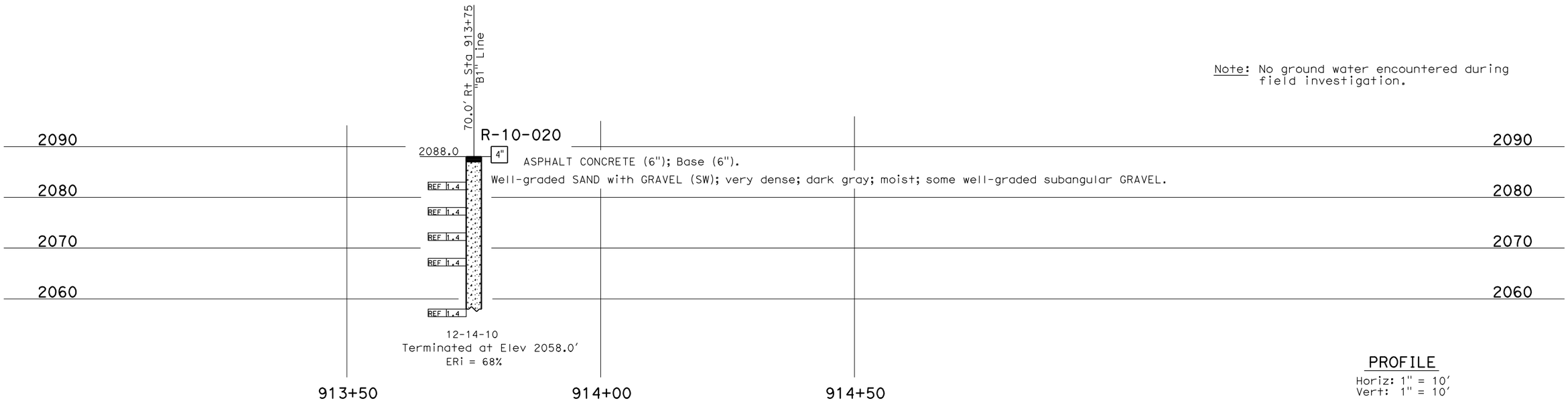
BENCH MARK

PNO 173 2120.910
FD STD Brass disk in concrete stamped "SBD-215-173 1988" 40′ Ely of EOD Devore Rd Bridge at NIy end bridge; 70′ NIy of EP NB SBD 215 at PM 17.3 at top of slope.

PNO 2010 2179.090
FD STD Brass disk in concrete stamped "D8 SCN SBD-15 PM 16.3 08.04.08" At top of slope SOUTH of Connector Bridge from NB SBD 15 to NB SBD 215.



PLAN
1" = 50′



12-14-10
Terminated at Elev 2058.0′
ERi = 68%

Note: No ground water encountered during field investigation.

PROFILE
Horiz: 1" = 10′
Vert: 1" = 10′

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	NEW SIGN POST
FUNCTIONAL SUPERVISOR	DRAWN BY: W. Tang 06/11	FIELD INVESTIGATION BY:	DESIGN BRANCH X	New	LOG OF TEST BORINGS 1 OF 3
NAME: A. Perez-Cobo	CHECKED BY: B. Levine/S. Logeswaran	C. Hoadley		POST MILE 17.3	

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003661 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
09-02-11				X	X

FILE => new-sign-post1of 3.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:47

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

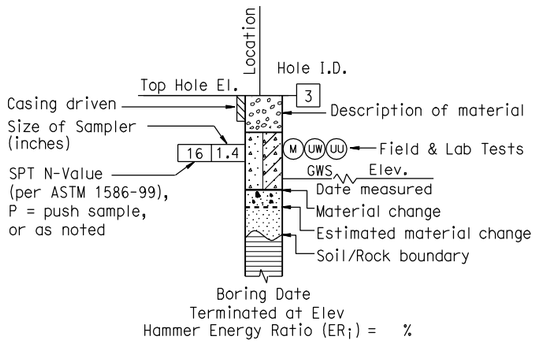
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

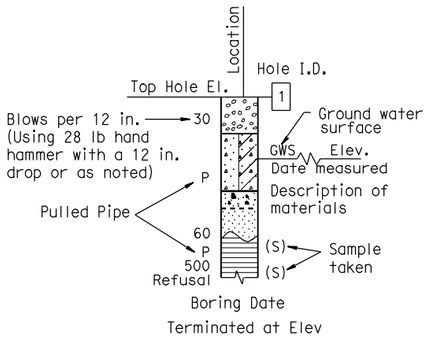
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

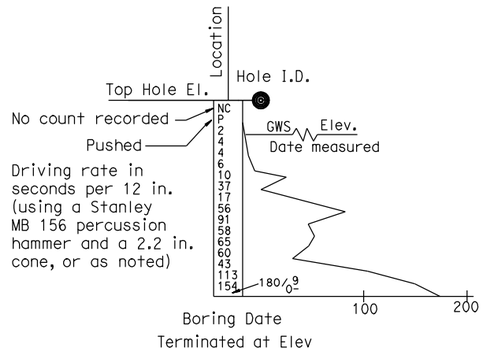
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



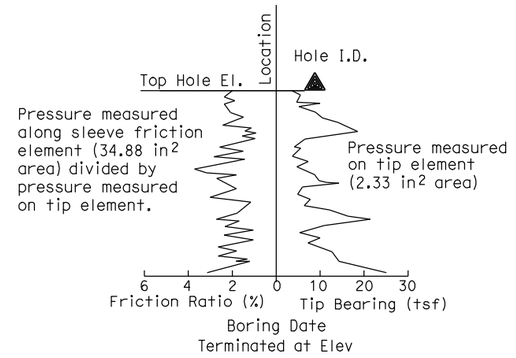
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	NEW SIGN POST
	PREPARED BY: W. Tang 06/11		DESIGN BRANCH X	NEW POST MILE 17.3	LOG OF TEST BORINGS 2 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003661 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
				X	X

FILE => new-sign-post2of 3.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:47

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly-graded GRAVEL Poorly-graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly-graded GRAVEL with SILT Poorly-graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly-graded GRAVEL with CLAY (or SILTY CLAY) Poorly-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly-graded SAND Poorly-graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly-graded SAND with SILT Poorly-graded SAND with SILT and GRAVEL		
SP-SC	Poorly-graded SAND with CLAY (or SILTY CLAY) Poorly-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook No. 1391 Exp. 12-31-11 CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 in.)
Very Loose	0 - 5
Loose	5 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	Greater than 50

MOISTURE

Description	Criteria
Dry	No discernable moisture
Moist	Moisture present, but no free water
Wet	Visible free water

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5% - 10%
Little	15% - 25%
Some	30% - 45%
Mostly	50% - 100%

PARTICLE SIZE

Description		Size (in.)
Boulder		Greater than 12
Cobble		3 - 12
Gravel	Coarse	3/4 - 3
	Fine	1/5 - 3/4
Sand	Coarse	1/16 - 1/5
	Medium	1/64 - 1/16
	Fine	1/300 - 1/64
Silt and Clay		Less than 1/300

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH X	BRIDGE NO. NEW POST MILE 17.3	NEW SIGN POST LOG OF TEST BORINGS 3 OF 3
	PREPARED BY: W. Tang 06/11				

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003661 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES	SHEET	OF
08-26-11	X	X

FILE => new-sign-post3of 3.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:47

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	215			

K. Douglas Cook 02-24-12
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST
K. Douglas Cook
No. 1391
Exp. 12-31-13
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PLANS APPROVAL DATE

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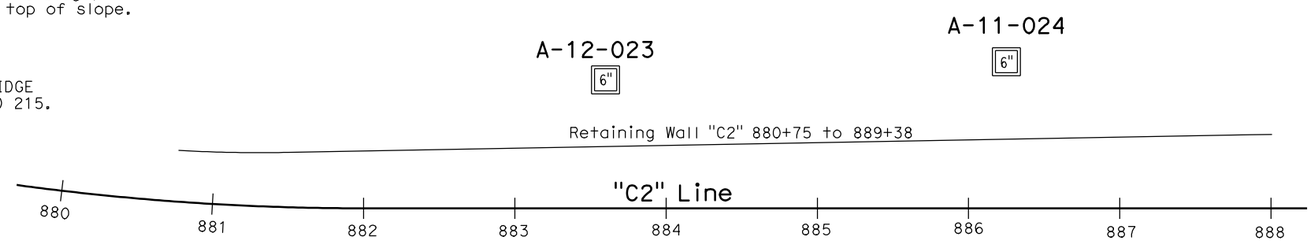
This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

BENCH MARK

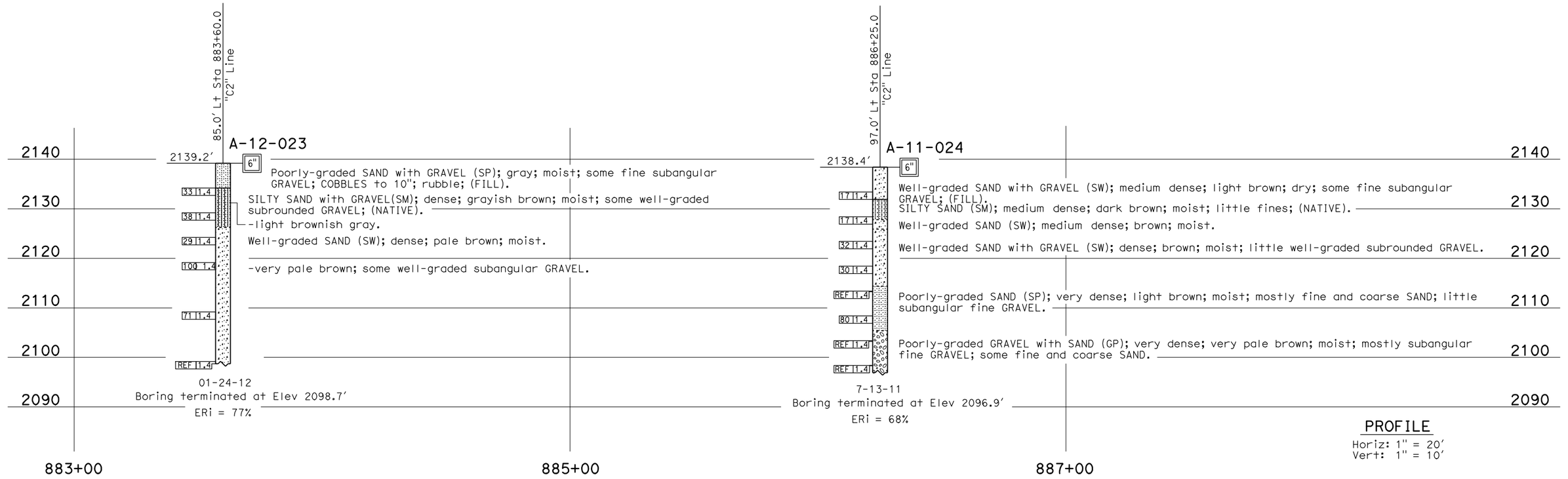
PNO 173 2120.910
Fd STD Brass disk in concrete stamped
"SBD-215-173 1988"
40′ Ely of EOD Devore Rd Bridge at Nly end Bidge;
70′ Nly of EP NB SBD 215 at PM 17.3 at top of slope.

PNO 2010 2179.090
Fd STD Brass disk in concrete stamped
"D8 SCN SBD-15 PM 16.3 08.04.08"
At top of slope SOUTH of CONNECTOR BRIDGE
from NB SBD 15 to NB SBD 15 to NB SBD 215.



PLAN
1" = 50′

Note: Ground water was not encountered at the time of this field investigation.



PROFILE
Horiz: 1" = 20′
Vert: 1" = 10′

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL "C2" 880+75 TO 889+38
FUNCTIONAL SUPERVISOR	DRAWN BY: F. Nguyen 8/11	FIELD INVESTIGATION BY:	DESIGN BRANCH X	POST MILE 17.35	LOG OF TEST BORINGS 1 OF 3
NAME: A. Perez-Cobo	CHECKED BY: M. Wilson	D. Cook			

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
09-23-11	10-19-11	02-22-12	02-24-12	X	X

FILE => rwc2-1of3.dgn

USERNAME => s128198 DATE PLOTTED => 24-FEB-2012 TIME PLOTTED => 12:53

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	215			

K. Douglas Cook 02-24-12
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST
K. Douglas Cook
No. 1391
Exp. 12-31-13
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PLANS APPROVAL DATE

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

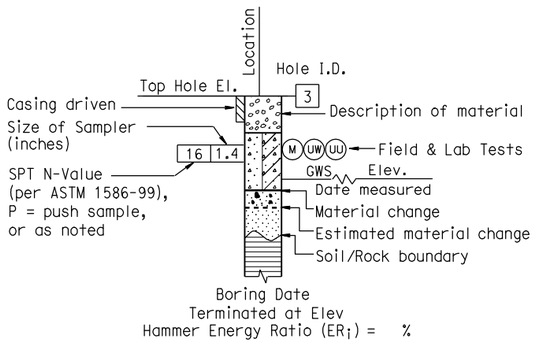
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

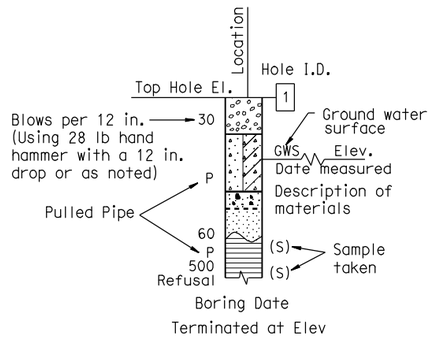
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

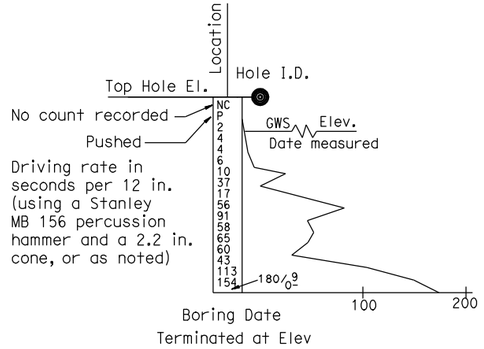
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



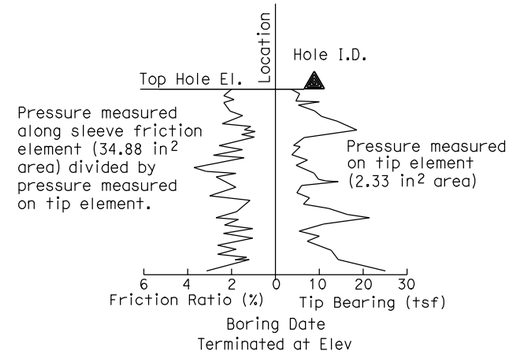
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL "C2" 880+75 TO 889+38
	PREPARED BY: F. Nguyen 8/11		DESIGN BRANCH X	POST MILE 17.35	LOG OF TEST BORINGS 2 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
10-19-11				X	X

FILE => rwc2-2of3.dgn

USERNAME => s128198 DATE PLOTTED => 24-FEB-2012 TIME PLOTTED => 12:53

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GM	SILTY GRAVEL SILTY GRAVEL with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL
SP	Poorly graded SAND Poorly graded SAND with GRAVEL
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SM	SILTY SAND SILTY SAND with GRAVEL
SC	CLAYEY SAND CLAYEY SAND with GRAVEL
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL
PT	PEAT
	COBBLES COBBLES and BOULDERS BOULDERS

Graphic/Symbol	Group Names
CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	215			

K. Douglas Cook 02-24-12
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-13 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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.

APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES

MATERIALS AND GEOTECHNICAL SERVICES

PREPARED BY: F. Nguyen 8/11

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN
DESIGN BRANCH X

BRIDGE NO.

POST MILE 17.35

RETAINING WALL "C2" 880+75 TO 889+38

LOG OF TEST BORINGS 3 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
10-19-11				X	X

FILE => rwc2-3of3.dgn

USERNAME => s128198 DATE PLOTTED => 24-FEB-2012 TIME PLOTTED => 12:53

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15/215			

K. Douglas Cook 02-24-12
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-13 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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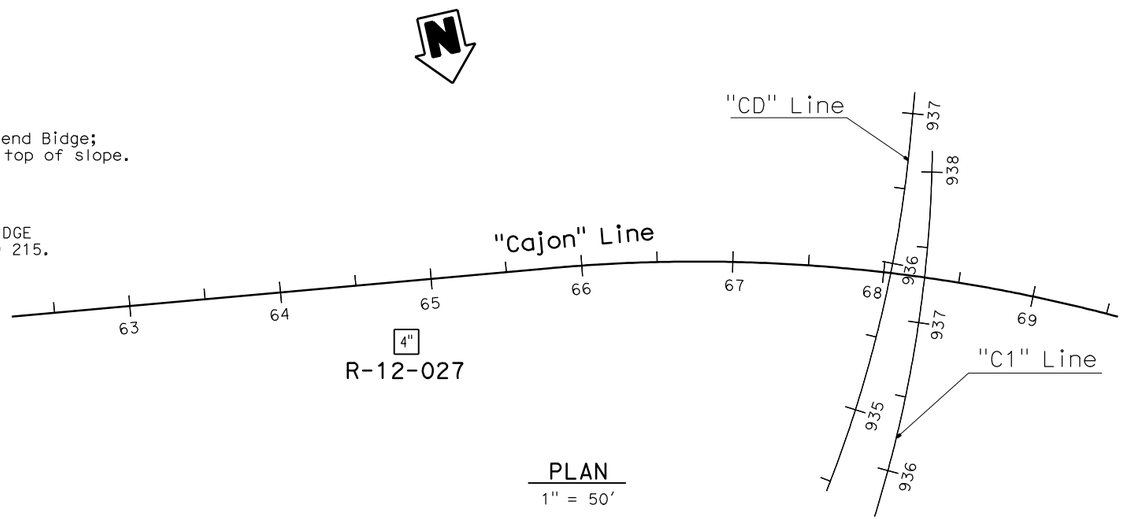
This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

BENCH MARK

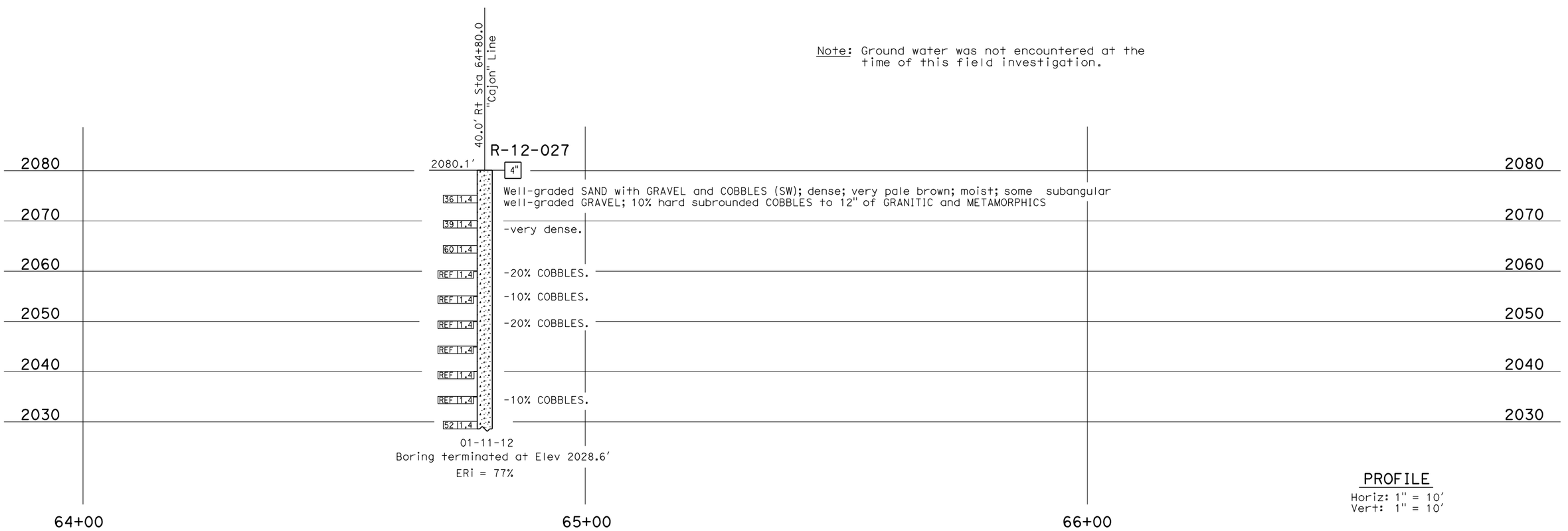
PNO 173 2120.910
Fd STD Brass disk in concrete stamped
"SBD-215-173 1988"
40′ Ely of EOD Devore Rd Bridge at Nly end Bidge;
70′ Nly of EP NB SBD 215 at PM 17.3 at top of slope.

PNO 2010 2179.090
Fd STD Brass disk in concrete stamped
"D8 SCN SBD-15 PM 16.3 08.04.08"
At top of slope SOUTH of CONNECTOR BRIDGE
from NB SBD 15 to NB SBD 15 to NB SBD 215.



PLAN
1" = 50′

Note: Ground water was not encountered at the time of this field investigation.



PROFILE
Horiz: 1" = 10′
Vert: 1" = 10′

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL CAJON 61+42 TO 91+50
FUNCTIONAL SUPERVISOR NAME: A. Perez-Cobo	DRAWN BY: F. Nguyen 8/11 CHECKED BY: M. Wilson	FIELD INVESTIGATION BY: D. Cook	DESIGN BRANCH X	POST MILE 17.35	LOG OF TEST BORINGS 1 OF 3

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
02-23-12	02-24-12			X	X

FILE => rwcajon1of3.dgn

USERNAME => s128198 DATE PLOTTED => 24-FEB-2012 TIME PLOTTED => 12:52

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	215			

K. Douglas Cook 02-24-12
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-13 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

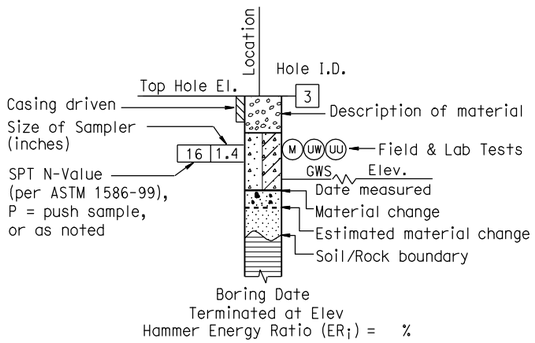
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

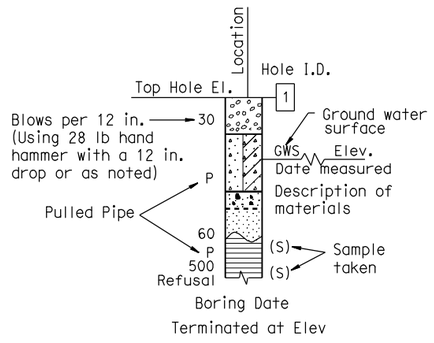
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

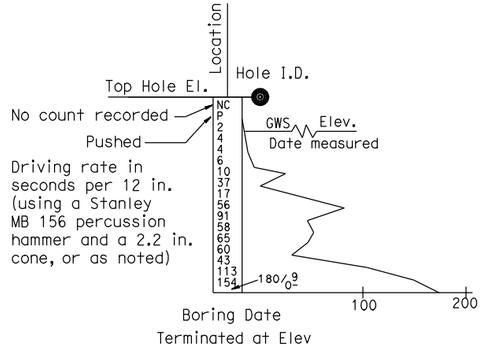
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



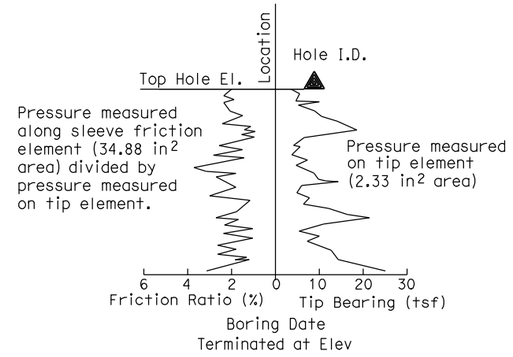
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL CAJON 61+42 TO 91+50
	PREPARED BY: F. Nguyen 8/11		DESIGN BRANCH X	POST MILE 17.35	LOG OF TEST BORINGS 2 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
02-22-12				X	X

FILE => rwcajon2of3.dgn

USERNAME => s128198 DATE PLOTTED => 24-FEB-2012 TIME PLOTTED => 12:52

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GM	SILTY GRAVEL SILTY GRAVEL with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL
SP	Poorly graded SAND Poorly graded SAND with GRAVEL
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SM	SILTY SAND SILTY SAND with GRAVEL
SC	CLAYEY SAND CLAYEY SAND with GRAVEL
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL
PT	PEAT
	COBBLES COBBLES and BOULDERS BOULDERS

Graphic/Symbol	Group Names
CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	215			

K. Douglas Cook 02-24-12
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-13 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES

MATERIALS AND GEOTECHNICAL SERVICES

PREPARED BY: F. Nguyen 8/11

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN
DESIGN BRANCH X

BRIDGE NO.

POST MILE 17.35

RETAINING WALL CAJON 61+42 TO 91+50

LOG OF TEST BORINGS 3 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
02-22-12				X	X

FILE => rwcajon3of3.dgn

USERNAME => s128198 DATE PLOTTED => 24-FEB-2012 TIME PLOTTED => 12:52

BENCH MARK

Set TBM Survey TP 2125
66 ft Rt Sta 871+50.0"A2" Line
Assumed Elev 2215.0 ft.
NAVD 1988.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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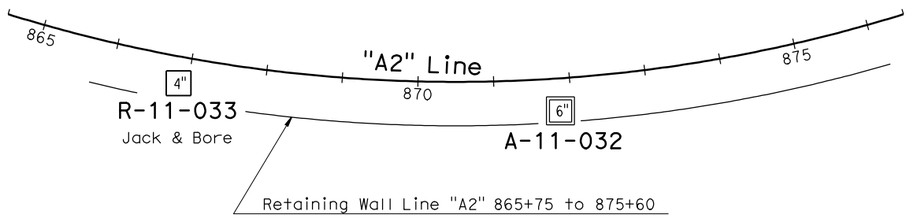
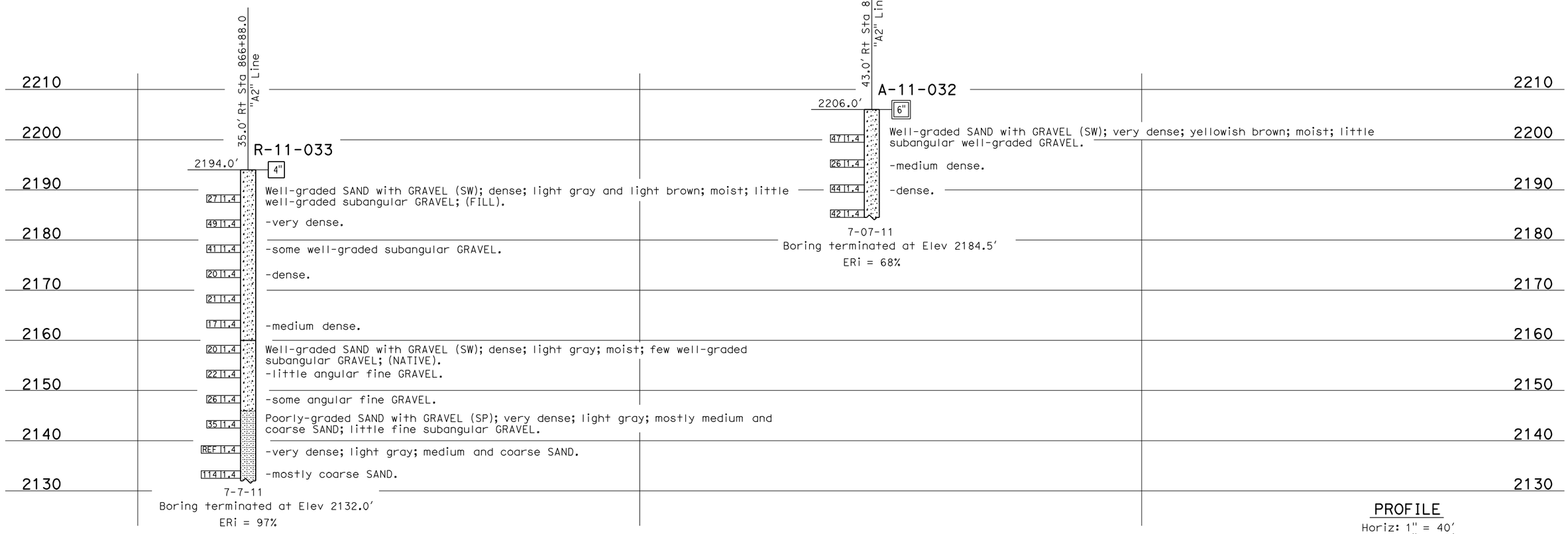
This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).



PLAN
1" = 100'

Note: Ground water was not encountered at the time of this field investigation.



PROFILE
Horiz: 1" = 40'
Vert: 1" = 10'

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL LINE "A2" 865+72 TO 875+60 AND JACK & BORE
FUNCTIONAL SUPERVISOR	DRAWN BY: F. Nguyen 9/11		DESIGN BRANCH X	NEW	LOG OF TEST BORINGS 1 OF 3
NAME: A. Perez-Cobo	CHECKED BY: B. Levine	FIELD INVESTIGATION BY: A. Wardak, D. Cook		POST MILE 16.50	

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
09-26-11	10-20-11	10-24-11		X	X

FILE => rwlinea2-1of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:14

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

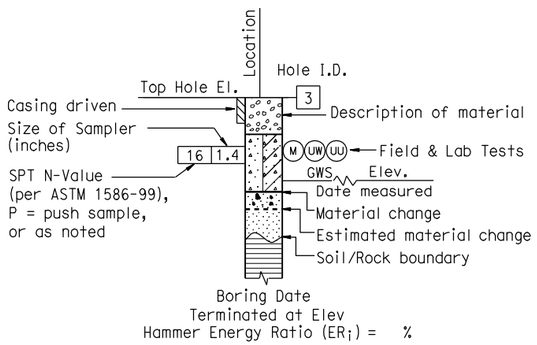
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

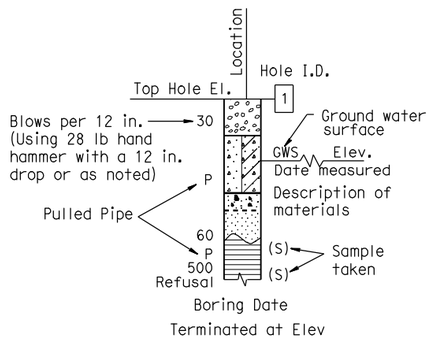
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

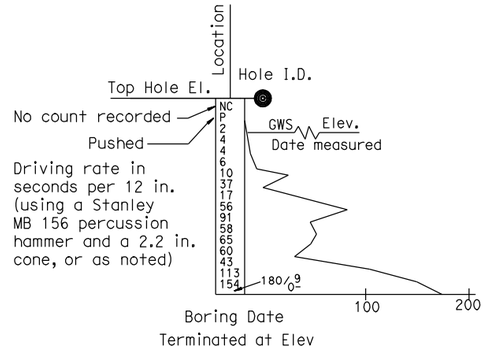
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



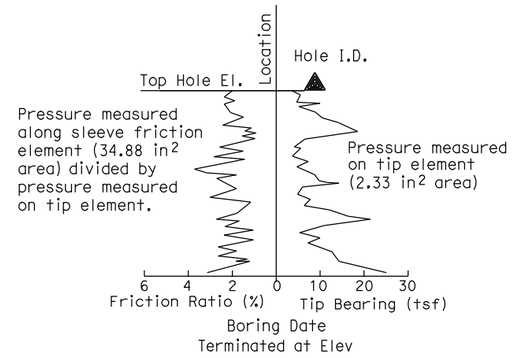
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL LINE "A2" 865+72 TO 875+60 AND JACK & BORE
	PREPARED BY: F. Nguyen 9/11		DESIGN BRANCH X	NEW POST MILE 16.50	LOG OF TEST BORINGS 2 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
10-24-11				X	X

FILE => rwlinea2-2of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:14

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

W. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL LINE "A2"
	PREPARED BY: F. Nguyen 9/11		DESIGN BRANCH X	NEW	865+72 TO 875+60 AND JACK & BORE
				POST MILE 16.50	LOG OF TEST BORINGS 3 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
10-24-11				X	X

FILE => rwlinea2-3of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:14

BENCH MARK

R-11-030 Set TBM on Survey TP 1145 at assumed Elev 2302.7′ located at 86.0′ Lt "B3" Line, Sta 978+03.0 NAVD 1988.

R-11-031 Set TBM on top of AC curb at assumed Elev 2211.5 located at 83.0′ Lt "B3" Line, Sta 970+02.0 NAVD 1988.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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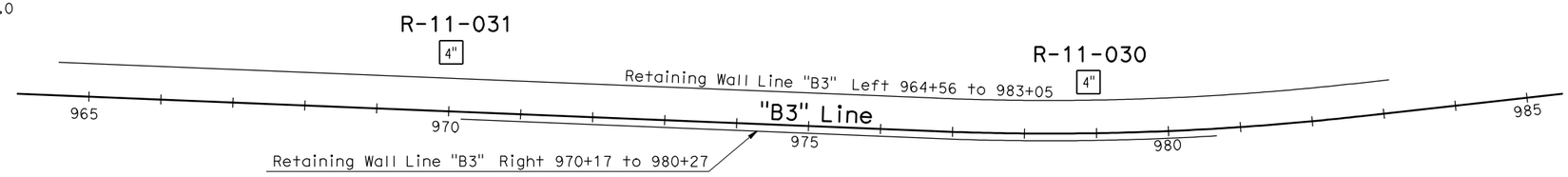
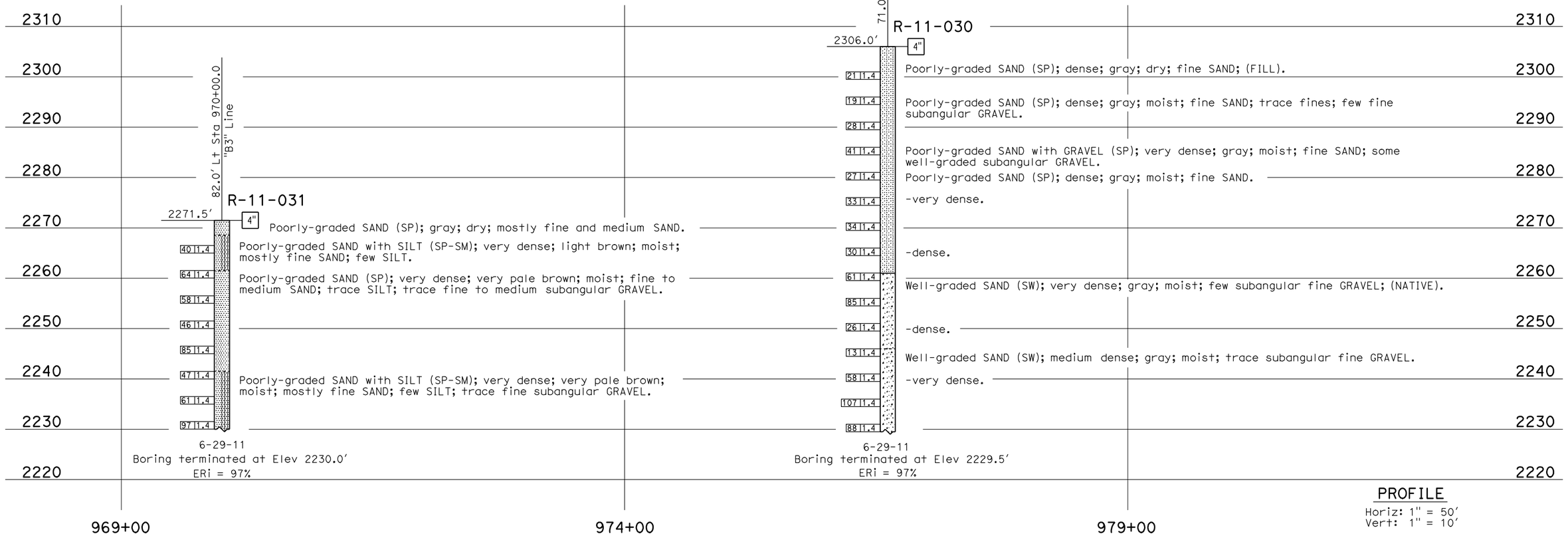
This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).



PLAN
1" = 100′

Note: Ground water was not encountered at the time of this field investigation.



PROFILE
Horiz: 1" = 50′
Vert: 1" = 10′

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL LINE "B3" 964+56 TO 983+05
FUNCTIONAL SUPERVISOR	DRAWN BY: F. Nguyen 9/11	FIELD INVESTIGATION BY:	DESIGN BRANCH X	NEW	LOG OF TEST BORINGS 1 OF 3
NAME: A. Perez-Cobo	CHECKED BY: B. Levine	S. Logeswaran		POST MILE R14.46	

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
09-26-11	10-20-11			X	X

FILE => rwlineb3-1of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:15

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

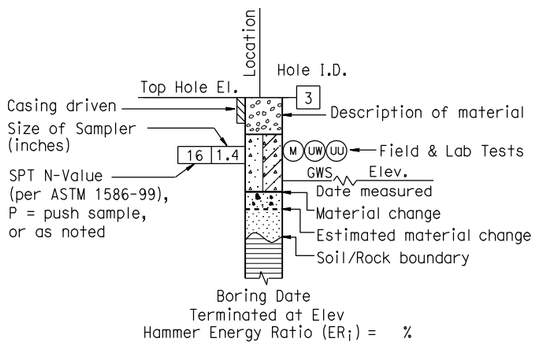
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

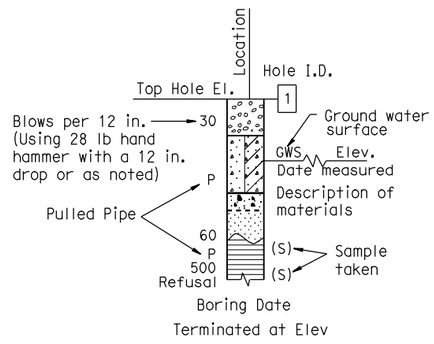
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

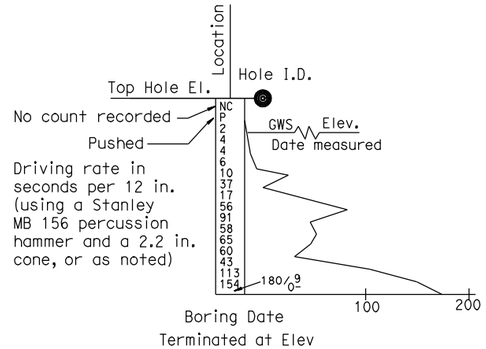
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



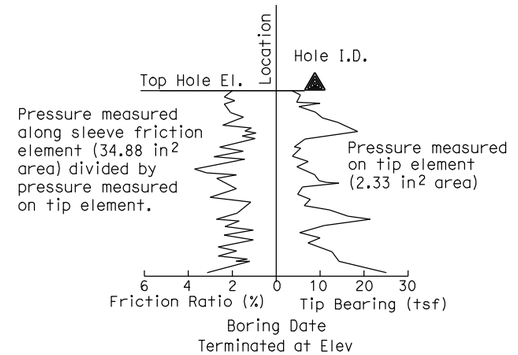
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL LINE "B3" 964+56 TO 983+05
	PREPARED BY: F. Nguyen 9/11		DESIGN BRANCH X	NEW POST MILE R14.46	LOG OF TEST BORINGS 2 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
10-20-11				X	X

FILE => rwlineb3-2of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:15

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
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- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL LINE "B3" 964+56 TO 983+05
	PREPARED BY: F. Nguyen 9/11		DESIGN BRANCH X	NEW	LOG OF TEST BORINGS 3 OF 3
				POST MILE R14.46	

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

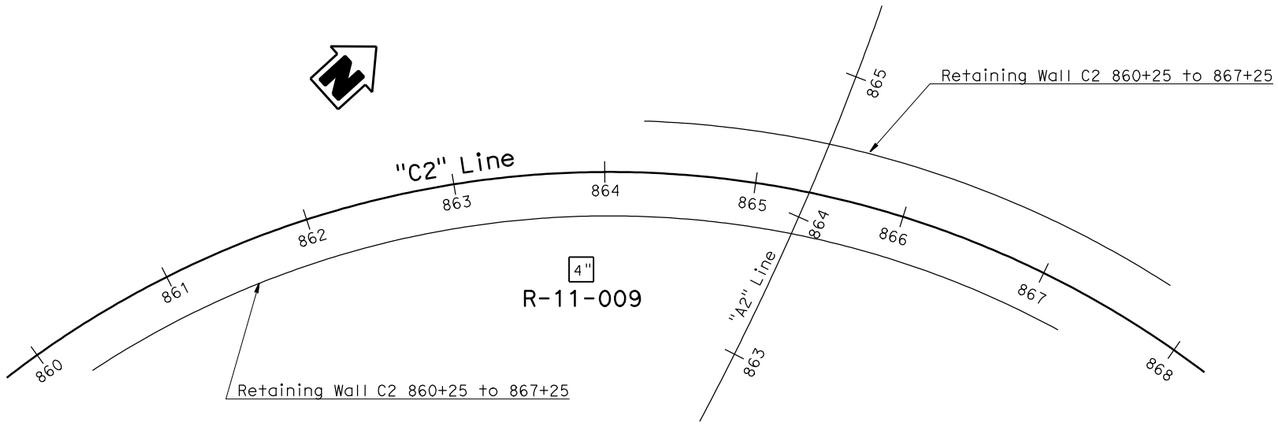
REVISION DATES				SHEET	OF
10-20-11				X	X

FILE => rwlineb3-3of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:15

BENCH MARK

Set TBM SWC Bridge 54-0783R located at 45.0 ft Lt Sta 937+50.0 "A2" Line assumed Elevation 2160.0′ (Topo) NAVD 1988.



PLAN
1" = 50′

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	215			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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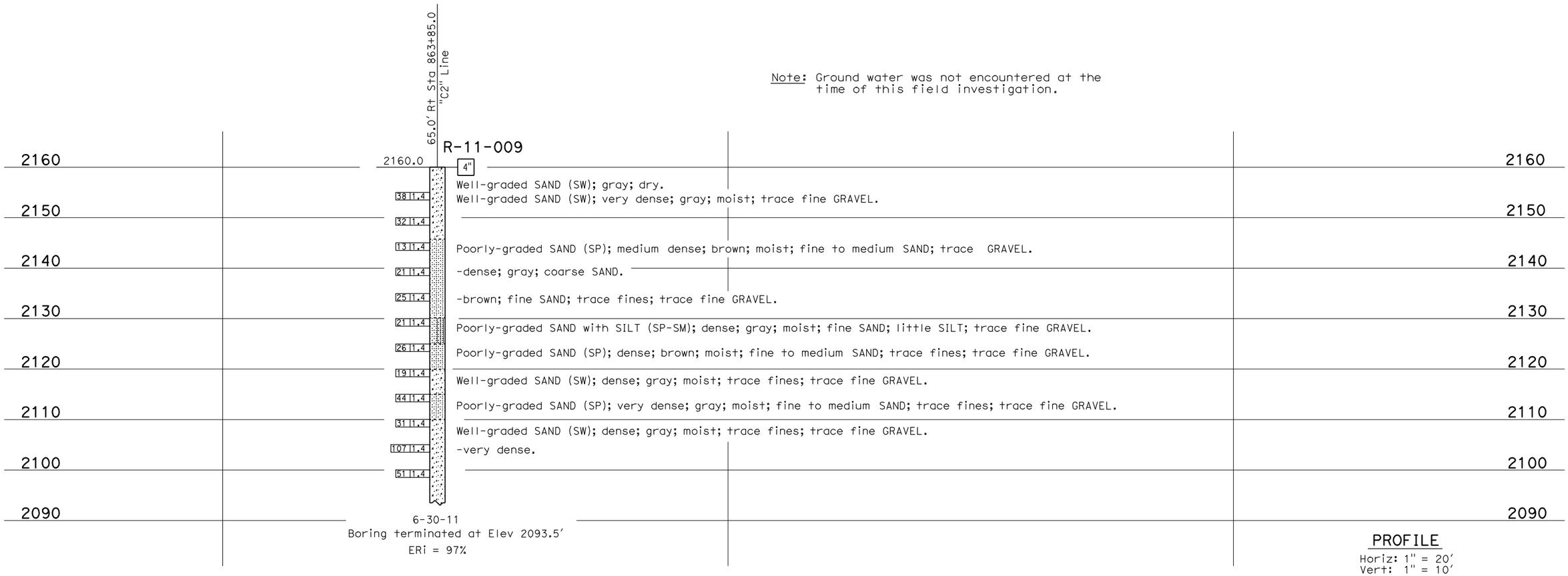
This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

Note: Ground water was not encountered at the time of this field investigation.



PROFILE
Horiz: 1" = 20′
Vert: 1" = 10′

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL "C2" 860+25 TO 867+25
FUNCTIONAL SUPERVISOR	DRAWN BY: F. Nguyen 9/11		DESIGN BRANCH X	NEW	
NAME: A. Perez-Cobo	CHECKED BY: B. Levine	FIELD INVESTIGATION BY: S. Logeswaran		POST MILE 17.70	LOG OF TEST BORINGS 1 OF 3

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
09-23-11	10-20-11			X	X

FILE => rwlinec2-1of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:16

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	215			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

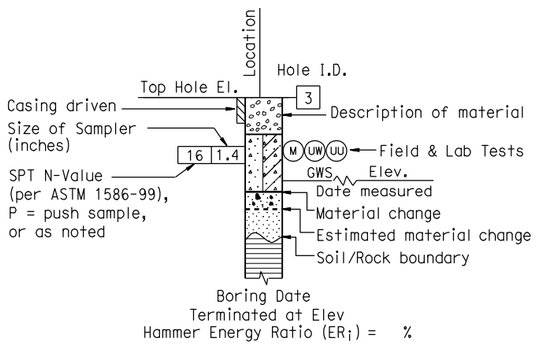
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

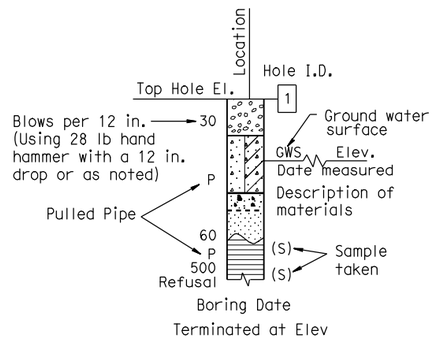
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

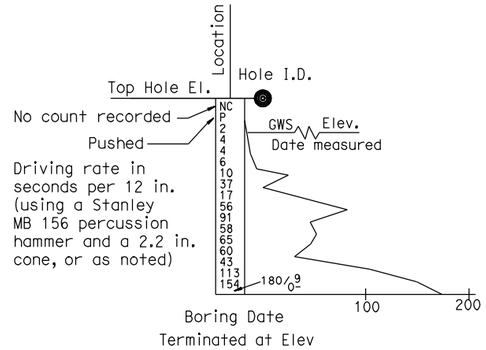
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



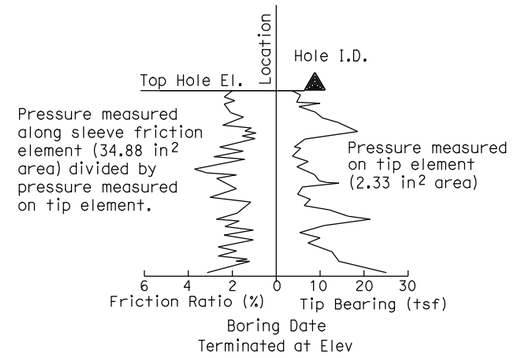
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL "C2" 860+25 TO 867+25
	PREPARED BY: F. Nguyen 9/11		DESIGN BRANCH X	NEW POST MILE 17.70	LOG OF TEST BORINGS 2 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES					SHEET	OF
					X	X

FILE => rwlinec2-2of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:16

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	215			

W. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL "C2" 860+25 TO 867+25
	PREPARED BY: F. Nguyen 9/11		DESIGN BRANCH X	NEW	LOG OF TEST BORINGS 3 OF 3
				POST MILE 17.70	

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
				X	X

FILE => rwlinec2-3of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:16

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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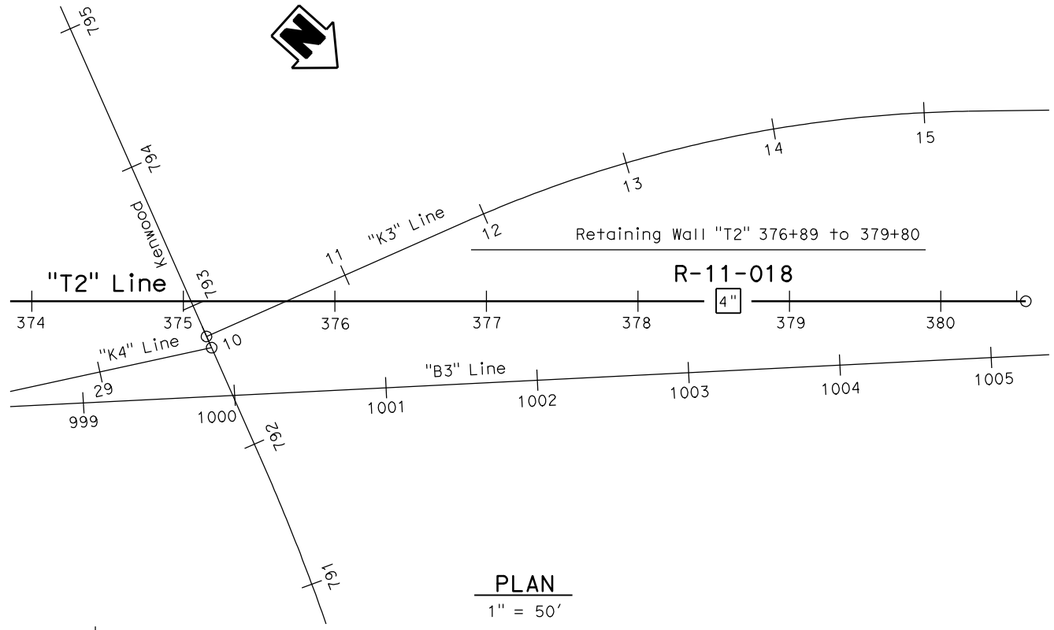
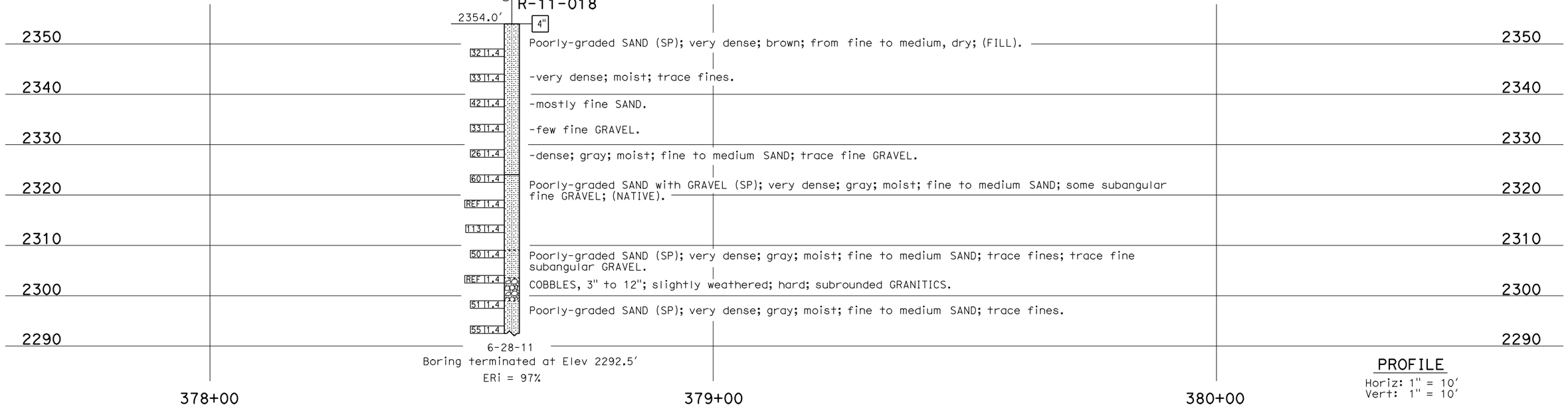
BENCH MARK

Set TBM ℄ Kenwood at ℄ SB 15 Off-Ramp
located at B3 1000+00 and K3 10+00
on Kenwood Line 792+74.
Assumed Elev 2354.0′ (Topo)
NAVD 1988.



PLAN
1" = 50′

Note: Ground water was not encountered at the time of this field investigation.



PROFILE
Horiz: 1" = 10′
Vert: 1" = 10′

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL "T2" 376+89 TO 379+80 LF
FUNCTIONAL SUPERVISOR	DRAWN BY: F. Nguyen 9/11	FIELD INVESTIGATION BY:	DESIGN BRANCH X	NEW	LOG OF TEST BORINGS 1 OF 3
NAME: A. Perez-Cobo	CHECKED BY: B. Levine	S. Logeswaran		POST MILE R15.04	

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
09-26-11	10-20-11			X	X

FILE => rwt2-1of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:17

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

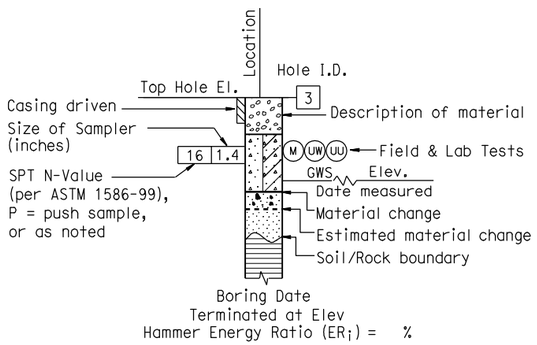
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

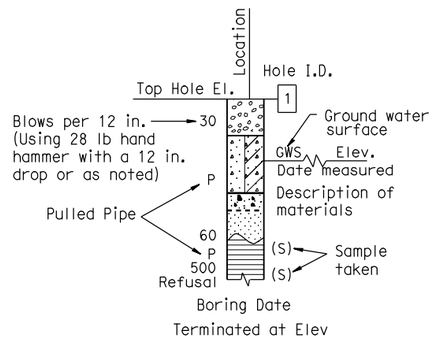
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

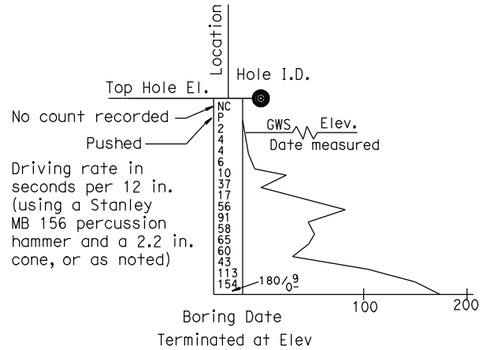
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



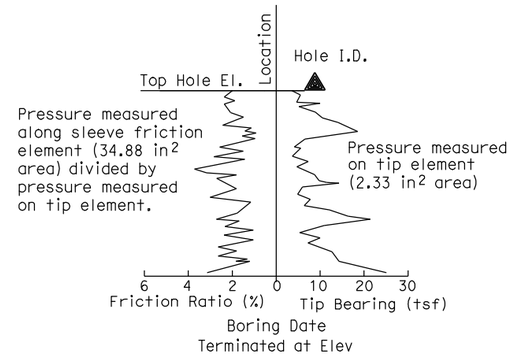
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL "T2" 376+89 TO 379+80 LF
	PREPARED BY: F. Nguyen 9/11		DESIGN BRANCH X	NEW POST MILE R15.04	LOG OF TEST BORINGS 2 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
10-20-11				X	X

FILE => rwt2-2of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:17

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

W. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — 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.

APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL "T2" 376+89 TO 379+80 LF
	PREPARED BY: F. Nguyen 9/11		DESIGN BRANCH X	NEW	LOG OF TEST BORINGS 3 OF 3
				POST MILE R15.04	

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
10-20-11				X	X

FILE => rwt2-3of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:17

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 2-21-12
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST
K. Douglas Cook
No. 1391
Exp. 12-31-13
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PLANS APPROVAL DATE

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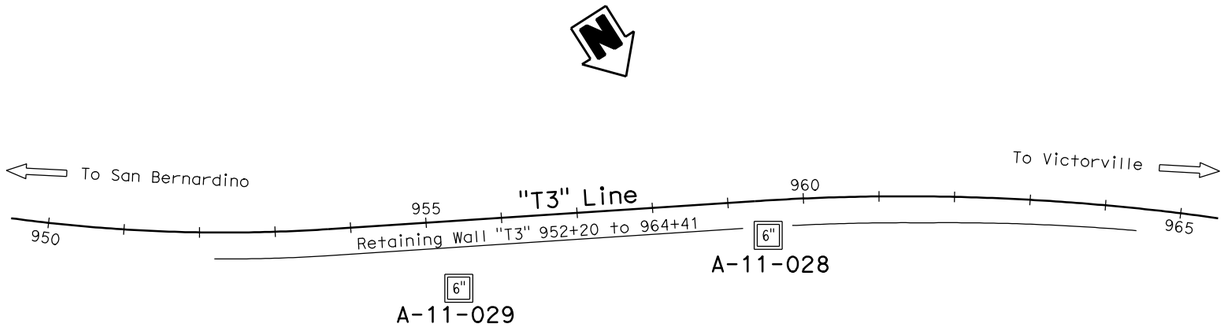
This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

BENCH MARK

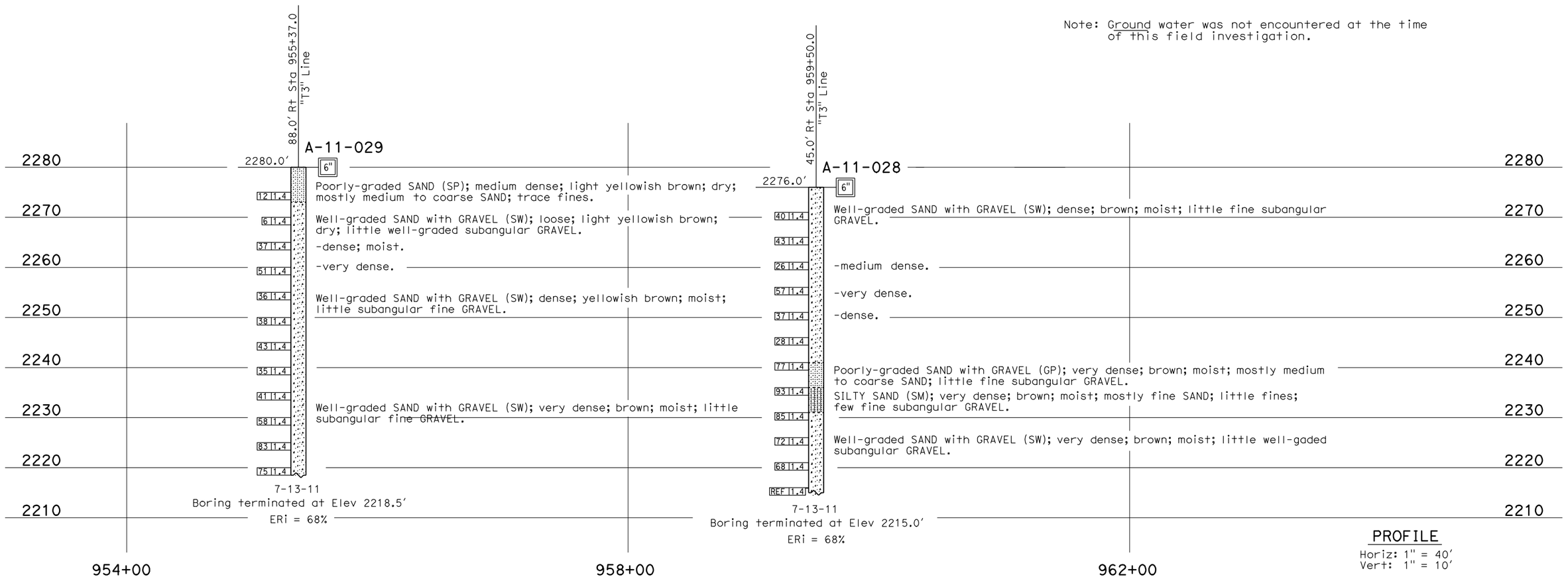
A-11-028 Set TBM on ℄ Nedlee Ave at 2276.0 (Topo) adjacant to Bore location 55.0′ Rt "T3" Line, Sta 959+45.0
NAVD 1988.

A-11-029 Set TBM on Survey Pt 112 at assumed Elev 227.9′ located 82.0′ Rt "T3" Line, Sta 955+55.0
NAVD 1988.



PLAN
1" = 100′

Note: Ground water was not encountered at the time of this field investigation.



PROFILE
Horiz: 1" = 40′
Vert: 1" = 10′

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL "T3" 952+20 TO 964+41
FUNCTIONAL SUPERVISOR	DRAWN BY: F. Nguyen 8/11	FIELD INVESTIGATION BY:	DESIGN BRANCH X	NEW	LOG OF TEST BORINGS 1 OF 3
NAME: A. Perez-Cobo	CHECKED BY: B. Levine	D. Cook		POST MILE R14.10	

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
09-26-11	10-26-11	02-21-12		X	X

FILE => rwt3-1of3.dgn

USERNAME => s116982 DATE PLOTTED => 21-FEB-2012 TIME PLOTTED => 10:31

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 2-21-12
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST
K. Douglas Cook
No. 1391
Exp. 12-31-13
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PLANS APPROVAL DATE

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

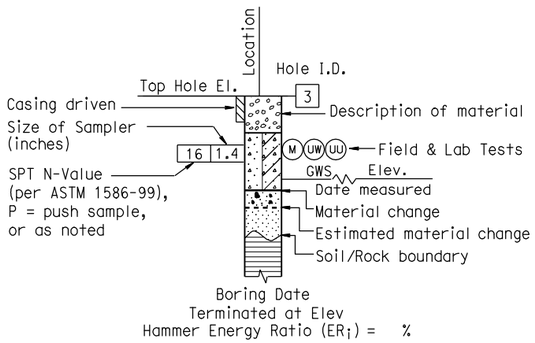
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

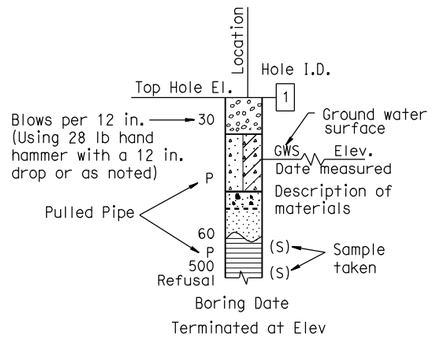
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

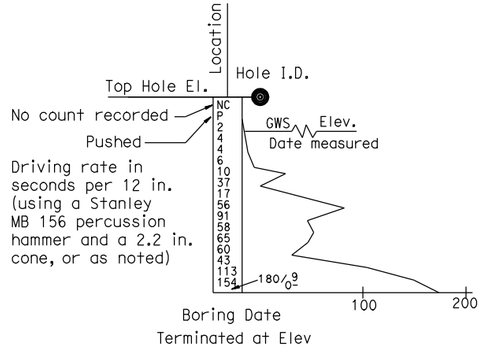
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



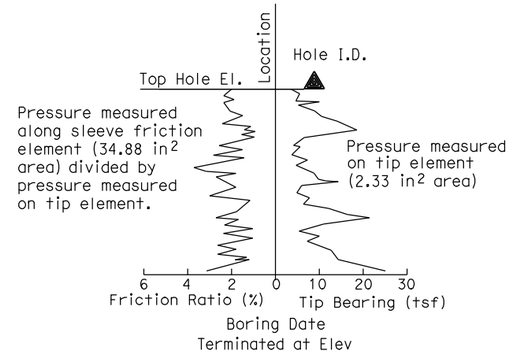
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	RETAINING WALL "T3" 952+20 TO 964+41
	PREPARED BY: F. Nguyen 8/11		DESIGN BRANCH X	NEW POST MILE R14.10	LOG OF TEST BORINGS 2 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
10-26-11	02-21-12			X	X

FILE => rwt3-2of3.dgn

USERNAME => s116982 DATE PLOTTED => 21-FEB-2012 TIME PLOTTED => 10:31

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)
GM	SILTY GRAVEL SILTY GRAVEL with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL
SP	Poorly graded SAND Poorly graded SAND with GRAVEL
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)
SM	SILTY SAND SILTY SAND with GRAVEL
SC	CLAYEY SAND CLAYEY SAND with GRAVEL
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL
PT	PEAT
	COBBLES COBBLES and BOULDERS BOULDERS

Graphic/Symbol	Group Names
CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 2-21-12
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST
K. Douglas Cook
No. 1391
Exp. 12-31-13
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PLANS APPROVAL DATE

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES

MATERIALS AND GEOTECHNICAL SERVICES
PREPARED BY: F. Nguyen 8/11

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH X

BRIDGE NO. NEW
POST MILE R14.10

RETAINING WALL "T3" 952+20 TO 964+41
LOG OF TEST BORINGS 3 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES				SHEET	OF
10-20-11	02-21-12			X	X

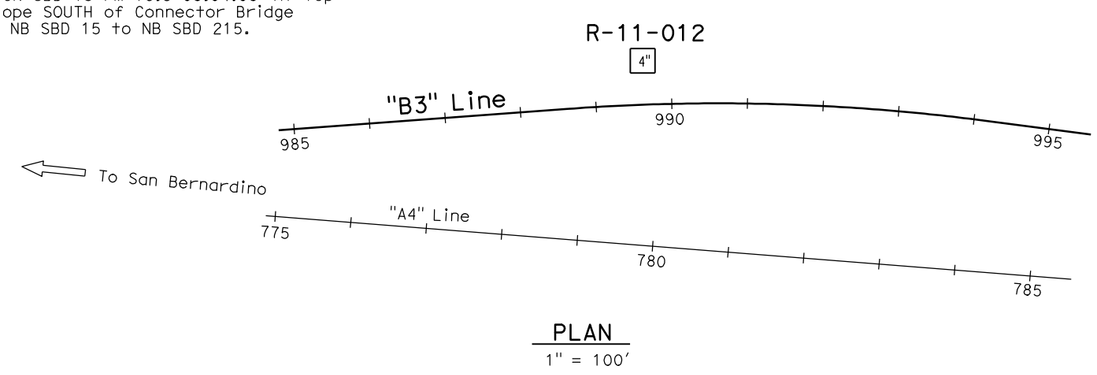
FILE => rwt3-3of3.dgn

USERNAME => s116982 DATE PLOTTED => 21-FEB-2012 TIME PLOTTED => 10:31

BENCH MARK

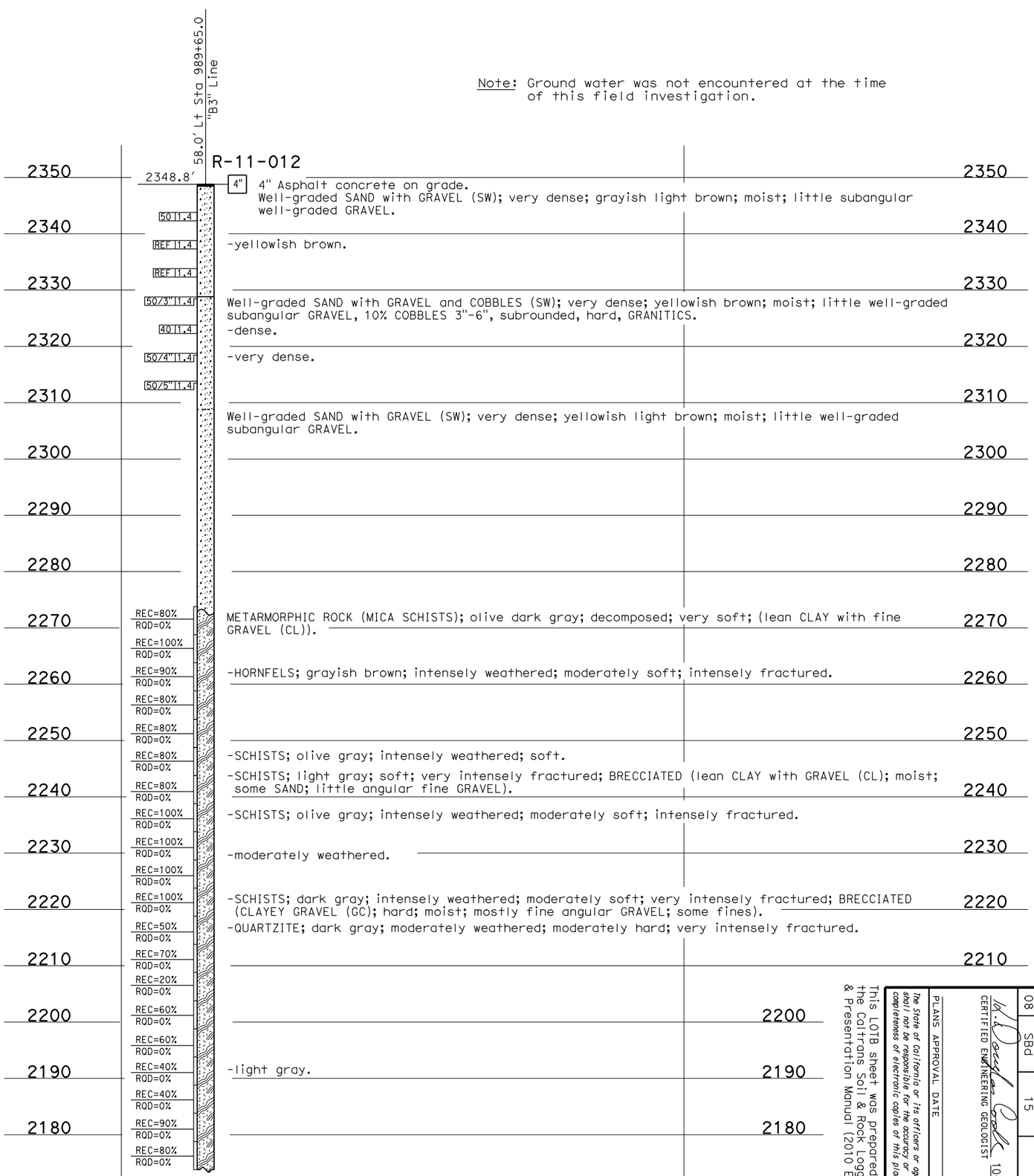
PNO 173 2120.910
FD STD Brass disk in concrete stamped "SBD-215-173 1988" 40′ Ely of EOD Devore Rd Bridge at NIy end bridge; 70′ NIy of EP NB SBD 215 at PM 17.3 at top of slope.

PNO 2010 2179.090
FD STD Brass disk in concrete stamped "D8 SCN SBD-15 PM 16.3 08.04.08" At top of slope SOUTH of Connector Bridge from NB SBD 15 to NB SBD 215.



PLAN
1" = 100′

Note: Ground water was not encountered at the time of this field investigation.



PROFILE
Horiz: 1" = 20′
Vert: 1" = 10′

This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

M. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

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PROFESSIONAL GEOLOGIST
M. Douglas Cook
No. 1391
Exp. 12-31-11
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO	TOTAL SHEETS
08	SBd	15			

ENGINEERING SERVICES
MATERIALS AND GEOTECHNICAL SERVICES

FUNCTIONAL SUPERVISOR
NAME: A. Perez-Cobo

DRAWN BY: F. Nguyen 6/11
CHECKED BY: B. Levine/S. Logeswaran

FIELD INVESTIGATION BY:
D. Cook

DGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES
FOR REDUCED PLANS

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

DIVISION OF ENGINEERING SERVICES
STRUCTURE DESIGN
DESIGN BRANCH X

BRIDGE NO.: NEW
POST MILE: R14.64

UNIT: 3643
PROJECT NUMBER & PHASE: 0800000366O

CONTRACT NO.: 08-0K7100

FILE => sb215conn1of4.dgn

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES
10-04-11

SHEET: X
OF: X

SB I-215 CONNECTOR
LOG OF TEST BORINGS 1 OF 4

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:48

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

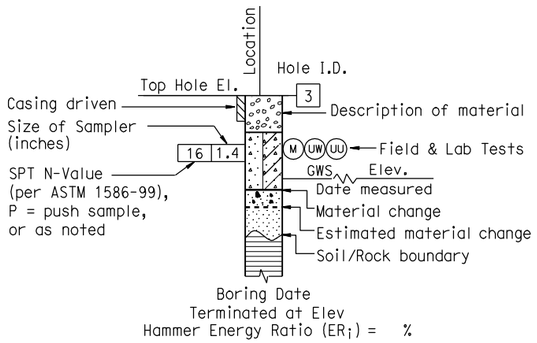
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

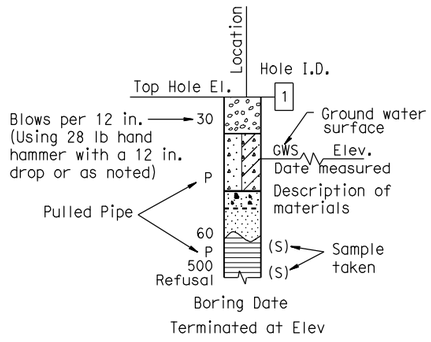
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

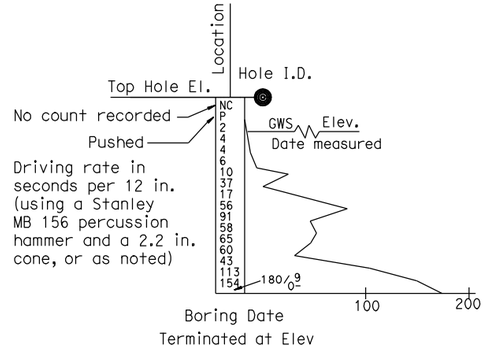
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



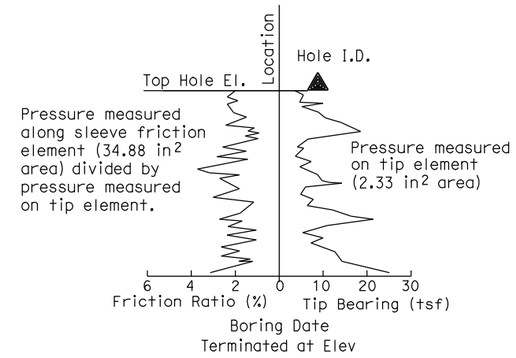
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SB I-215 CONNECTOR
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	NEW POST MILE R14.64	LOG OF TEST BORINGS 2 OF 4

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-25-11				X	X

FILE => sb215conn2of4.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:49

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SB I-215 CONNECTOR
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	NEW POST MILE R14.64	LOG OF TEST BORINGS 3 OF 4

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-25-11				X	X

FILE => sb215conn3of4.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:49

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

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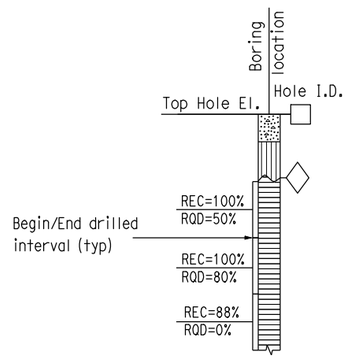
PROFESSIONAL GEOLOGIST — K. Douglas Cook No. 1391 Exp. 12-31-11 CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

$$REC = \frac{\sum \text{Length of the recovered core pieces (in.)}}{\text{Total length of core run (in.)}} \times 100\%$$

$$RQD = \frac{\sum \text{Length of intact core pieces} \geq 4 \text{ in.}}{\text{Total length of core run (in.)}} \times 100\%$$

RQD* Indicates soundness criteria not met.



BEDDING SPACING

Description	Thickness / Spacing
Massive	Greater than 10 ft
Very Thickly Bedded	3 ft - 10 ft
Thickly Bedded	1 ft - 3 ft
Moderately Bedded	4 in. - 1 ft
Thinly Bedded	1 in. - 4 in.
Very Thinly Bedded	1/4 in. - 1 in.
Laminated	Less than 1/4 in.

LEGEND OF ROCK MATERIALS

- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

ROCK HARDNESS

Description	Criteria
Extremely Hard	Cannot be scratched with a pocketknife or sharp pick. Can only be chipped with repeated heavy hammer blows.
Very Hard	Cannot be scratched with a pocketknife or sharp pick. Breaks with repeated heavy hammer blows.
Hard	Can be scratched with a pocketknife or sharp pick with difficulty (heavy pressure). Breaks with heavy hammer blows.
Moderately Hard	Can be scratched with pocketknife or sharp pick with light or moderate pressure. Breaks with moderate hammer blows.
Moderately Soft	Can be grooved 1/16 in. deep with a pocketknife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Can be grooved or gouged easily by a pocketknife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.
Very Soft	Can be readily indented, grooved or gouged with fingernail, or carved with a pocketknife. Breaks with light manual pressure.

FRACTURE DENSITY

Description	Observed Fracture Density
Unfractured	No fractures.
Very Slightly Fractured	Core lengths greater than 3 ft.
Slightly Fractured	Core lengths mostly from 1 to 3 ft.
Moderately Fractured	Core lengths mostly from 4 in. to 1 ft.
Intensely Fractured	Core lengths mostly from 1 to 4 in.
Very Intensely Fractured	Mostly chips and fragments.

WEATHERING DESCRIPTORS FOR INTACT ROCK

Description	Diagnostic Features					General Characteristics
	Chemical Weathering-Discoloration and/or Oxidation		Mechanical Weathering-Grain Boundary Conditions (Disaggregation) Primarily for Granitics and Some Coarse-Grained Sediments	Texture and Leaching		
	Body of Rock	Fracture Surfaces		Texture	Leaching	
Fresh	No discoloration, not oxidized.	No discoloration or oxidation.	No separation, intact (tight).	No change	No leaching	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull.	Minor to complete discoloration or oxidation of most surfaces.	No visible separation, intact (tight).	Preserved	Minor leaching of some soluble minerals.	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty," feldspar crystals are "cloudy."	All fracture surfaces are discolored or oxidized.	Partial separation of boundaries visible.	Generally preserved	Soluble minerals may be mostly leached.	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in-situ disaggregation, see grain boundary conditions.	All fracture surfaces are discolored or oxidized, surfaces friable.	Partial separation, rock is friable; in semiarid conditions granitics are disaggregated.	Texture altered by chemical disintegration (hydration, argillation).	Leaching of soluble minerals may be complete.	Dull sound when struck with hammer, usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures, or veinlets. Rock is significantly weakened.
Decomposed	Discolored or oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay.		Complete separation of grain boundaries (disaggregated).	Resembles a soil, partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete.		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes."

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SB I-215 CONNECTOR
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	NEW POST MILE R14.64	LOG OF TEST BORINGS 4 OF 4

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-25-11				X	X

FILE => sb215conn4of4.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:49

BENCH MARK

PNO 173 2120.910
FD STD Brass disk in concrete stamped "SBD-215-173 1988" 40' Ely of EOD Devore Rd Bridge at NIy end bridge; 70' NIy of EP NB SBD 215 at PM 17.3 at top of slope.

PNO 2010 2179.090
FD STD Brass disk in concrete stamped "D8 SCN SBD-15 PM 16.3 08.04.08" At top of slope SOUTH of Connector Bridge from NB SBD 15 to NB SBD 215.

211.0' Lt Sta 791+00 "A4" Line

R-11-014

4"

Note: No ground water encountered during field investigation.

2360.0'

Well-graded SAND with SILT and GRAVEL (SW-SM); dense; brown; moist; little fine subangular GRAVEL; (FILL).

40 ft.4

Well-graded SAND with GRAVEL (SW); medium dense; yellowish brown; moist; some well-graded subangular GRAVEL; (ALLUVIUM).

25 ft.4

28 ft.4

Well-graded SAND with GRAVEL and COBBLES (SW); dense; yellowish brown; moist; some well-graded subangular GRAVEL; 10% subrounded COBBLES, 3-8", hard; GRANITICS and moderately soft, METAMORPHICS.

57 ft.4

-very dense.

60 ft.4

REF ft.4

Well-graded GRAVEL with SAND and COBBLES (GW); very dense; grayish brown; moist; subangular GRAVEL; some well-graded SAND; 10% COBBLES, 3-8", subangular, hard.

REF ft.4

GRANITIC BOULDERS, subrounded, hard.

REF ft.4

Well-graded SAND with GRAVEL (SW); very dense; grayish brown; some well-graded, subangular GRAVEL.

GNESSIC BOULDERS; subrounded; moderately hard.

Well-graded SAND with GRAVEL and COBBLES (SW); grayish brown; moist; some well-graded subangular GRAVEL; 20% COBBLES, 3-6", subrounded, hard; GRANITICS and moderately soft, METAMORPHICS.

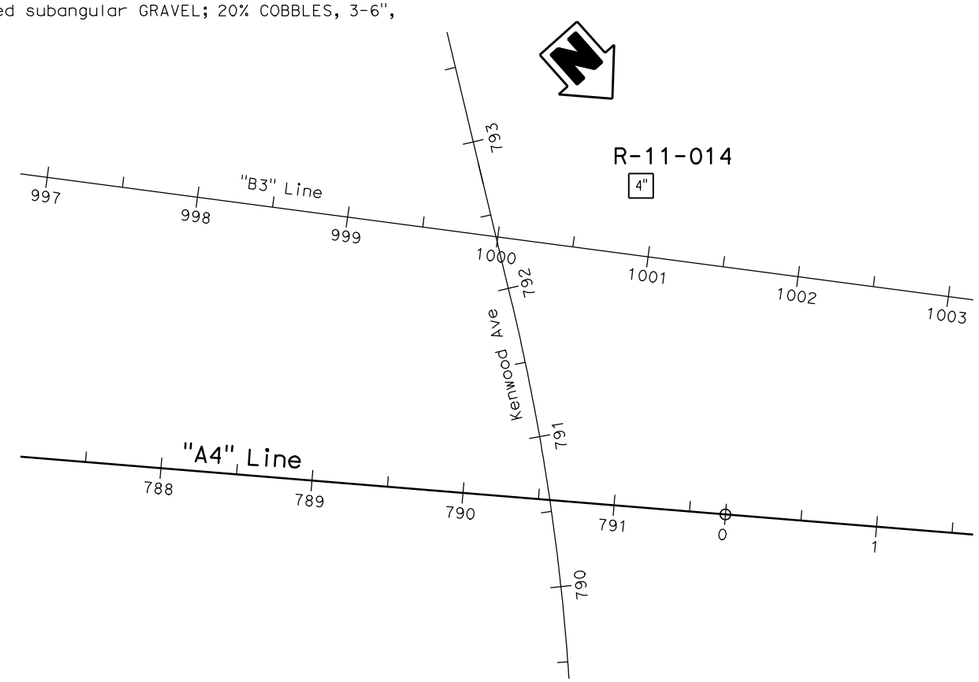
2360
2350
2340
2330
2320
2310
2300
2290
2280
2270
2260
2250
2240
2230
2220

2-2-11
Terminated at Elev 2220.0'
ERi = 68%

791+00 791+50 792+00

PROFILE

Horiz: 1" = 10'
Vert: 1" = 10'



PLAN

1" = 50'

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SB 215 MAINLINE AND SB 15
FUNCTIONAL SUPERVISOR	DRAWN BY: W. Tang 06/11	FIELD INVESTIGATION BY:	DESIGN BRANCH X	NEW	LOG OF TEST BORINGS 1 OF 3
NAME: A. Perez-Cobo	CHECKED BY: B. Levine/S. Logeswaran	D. Cook		POST MILE R15.00	

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
09-06-11	10-06-11			X	X

FILE => sb215mainline1of3.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:50

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

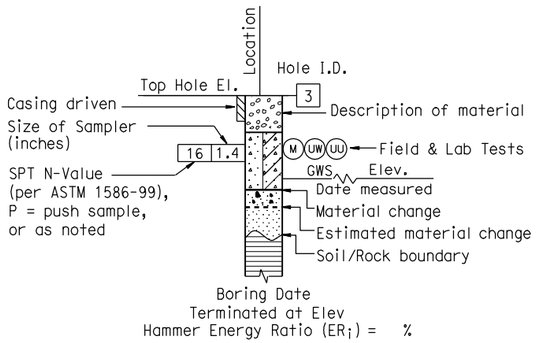
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

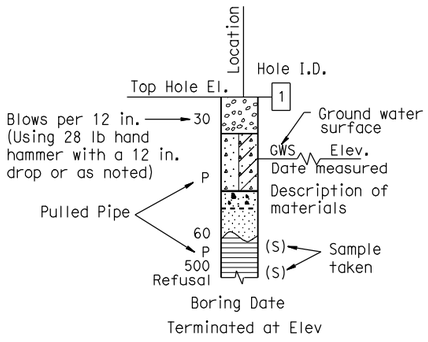
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

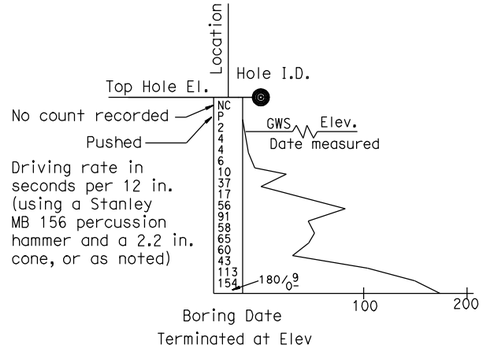
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



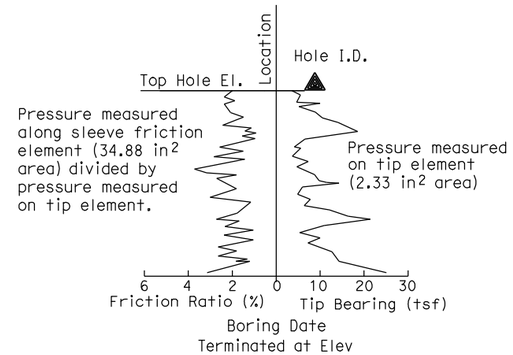
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SB 215 MAINLINE AND SB 15
	PREPARED BY: W. Tang 06/11		DESIGN BRANCH X	54-NEW POST MILE R14.94	LOG OF TEST BORINGS 2 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003661 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
				X	X

FILE => sb215mainline2of3.dgn

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REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly-graded GRAVEL Poorly-graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly-graded GRAVEL with SILT Poorly-graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly-graded GRAVEL with CLAY (or SILTY CLAY) Poorly-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly-graded SAND Poorly-graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly-graded SAND with SILT Poorly-graded SAND with SILT and GRAVEL		
SP-SC	Poorly-graded SAND with CLAY (or SILTY CLAY) Poorly-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook No. 1391 Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 in.)
Very Loose	0 - 5
Loose	5 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	Greater than 50

MOISTURE

Description	Criteria
Dry	No discernable moisture
Moist	Moisture present, but no free water
Wet	Visible free water

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5% - 10%
Little	15% - 25%
Some	30% - 45%
Mostly	50% - 100%

PARTICLE SIZE

Description		Size (in.)
Boulder		Greater than 12
Cobble		3 - 12
Gravel	Coarse	3/4 - 3
	Fine	1/5 - 3/4
Sand	Coarse	1/16 - 1/5
	Medium	1/64 - 1/16
	Fine	1/300 - 1/64
Silt and Clay		Less than 1/300

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH X	BRIDGE NO. 54-NEW POST MILE R14.94	SB 215 MAINLINE AND SB 15 LOG OF TEST BORINGS 3 OF 3
	PREPARED BY: W. Tang 06/11				

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003661 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-26-11				X	X

FILE => sb215mainline3of3.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:50

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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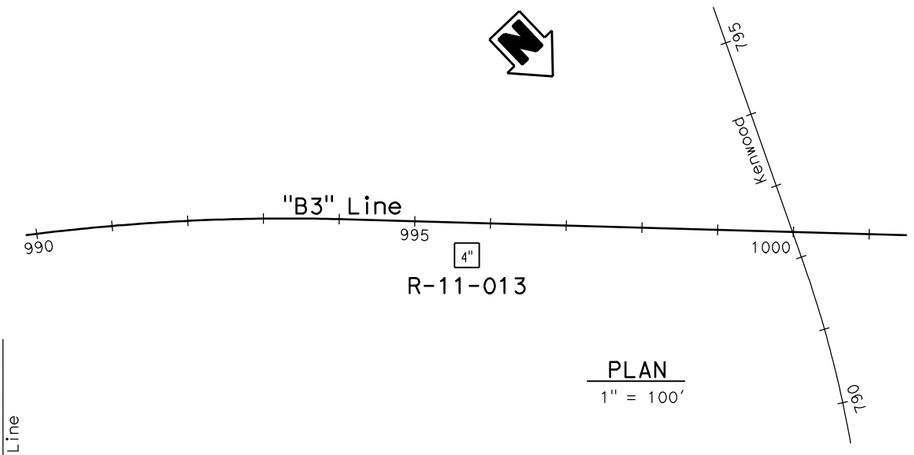
This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

BENCH MARK

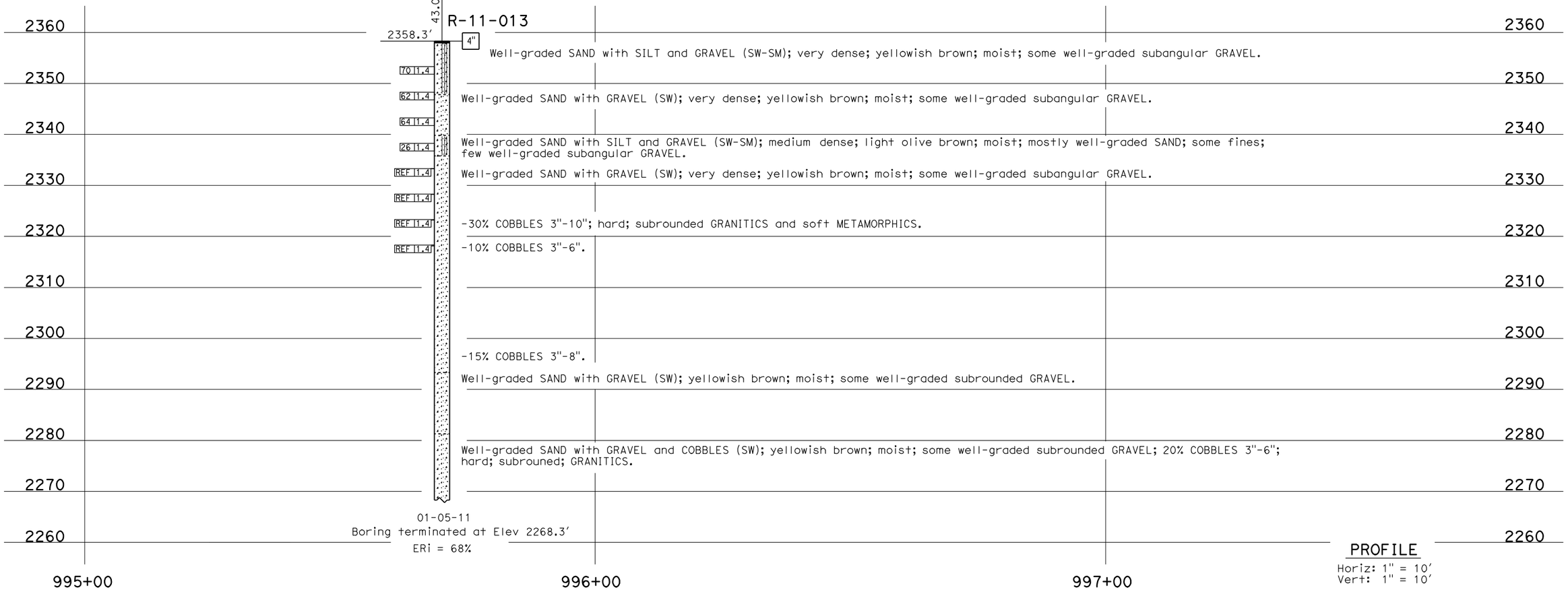
PNO 173 2120.910
FD STD Brass disk in concrete stamped "SBD-215-173 1988" 40′ Ely of EOD Devore Rd Bridge at Nly end bridge; 70′ Nly of EP NB SBD 215 at PM 17.3 at top of slope.

PNO 2010 2179.090
FD STD Brass disk in concrete stamped "D8 SCN SBD-15 PM 16.3 08.04.08" At top of slope SOUTH of Connector Bridge from NB SBD 15 to NB SBD 215.



PLAN
1" = 100′

Note: Ground water was not encountered at the time of this field investigation.



PROFILE
Horiz: 1" = 10′
Vert: 1" = 10′

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SB 215 MAINLINE OVER KENWOOD
FUNCTIONAL SUPERVISOR	DRAWN BY: F. Nguyen 6/11		DESIGN BRANCH X	NEW	LOG OF TEST BORINGS 1 OF 3
NAME: A. Perez-Cobo	CHECKED BY: B. Levine/S. Logeswaran	FIELD INVESTIGATION BY: M. Wilson		POST MILE R14.95	

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-25-11	10-04-11			X	X

FILE => sb215mln-knwd1of3.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:51

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

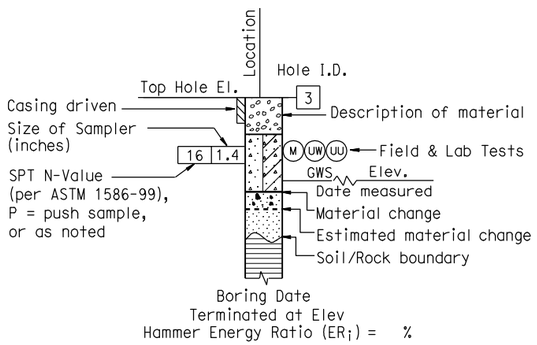
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

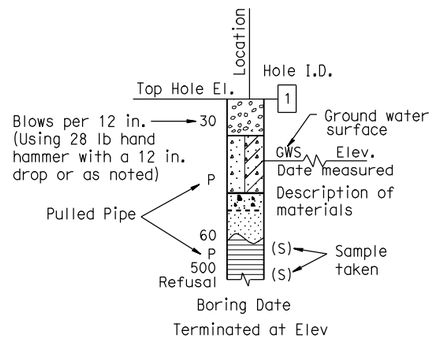
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

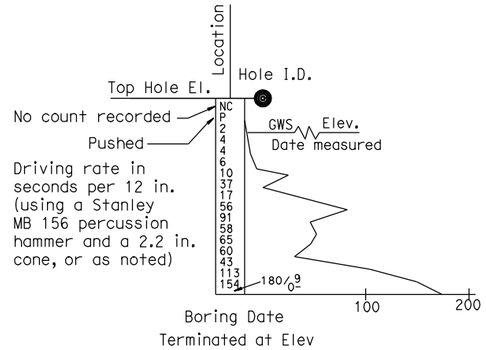
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



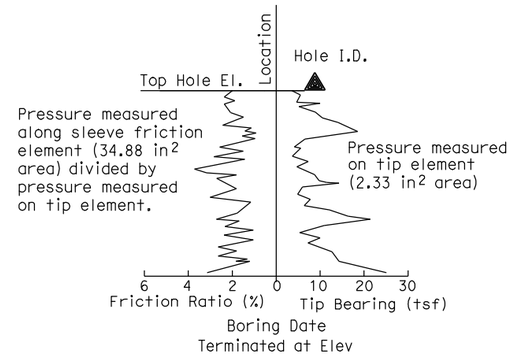
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SB 215 MAINLINE OVER KENWOOD
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	NEW POST MILE R14.95	LOG OF TEST BORINGS 2 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-25-11				X	X

FILE => sb215mln-knwd2of3.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:51

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SB 215 MAINLINE OVER KENWOOD
	PREPARED BY: F. Nguyen 6/11		DESIGN BRANCH X	NEW POST MILE R14.95	LOG OF TEST BORINGS 3 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-25-11				X	X

FILE => sb215mln-knwd3of3.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:51

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST
K. Douglas Cook
No. 1391
Exp. 12-31-11
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

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218.0' Lt Sta 788+35
"A4" Line

R-11-015

2352.2'

4" ASPHALT CONCRETE (6"); Base GRAVEL (12").

Well-graded SAND with GRAVEL (SW); medium dense; gray; moist; little subangular fine GRAVEL; (FILL).

Well-graded SAND with GRAVEL (SW); very dense; brown; moist; some well-graded subangular GRAVEL; (ALLUVIUM).

-dense; yellowish brown.

-very dense.

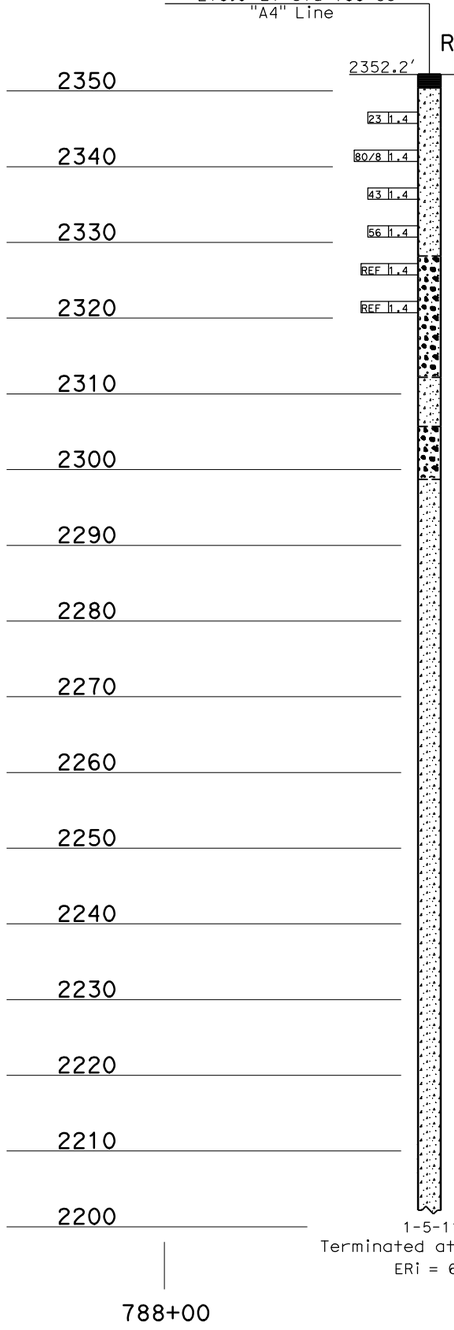
Well-graded GRAVEL with SAND (GW); very dense; grayish light brown; moist; mostly subangular GRAVEL; some well-graded SAND.

-10% COBBLES, 3-6"; hard; subangular; GRANITICS.

Well-graded SAND with GRAVEL (SW); yellowish brown; moist; some well-graded subangular GRAVEL.

Well-graded GRAVEL with SAND (GW); yellowish brown; moist; subangular GRAVEL; some well-graded SAND.

Well-graded SAND with GRAVEL and COBBLES (SW); yellowish brown; moist; some well-graded subangular GRAVEL; 10% COBBLES, 3-8", hard, subrounded GRANITICS.



1-5-11
Terminated at Elev 2202.2'
ERi = 68%

788+00 788+50 789+00

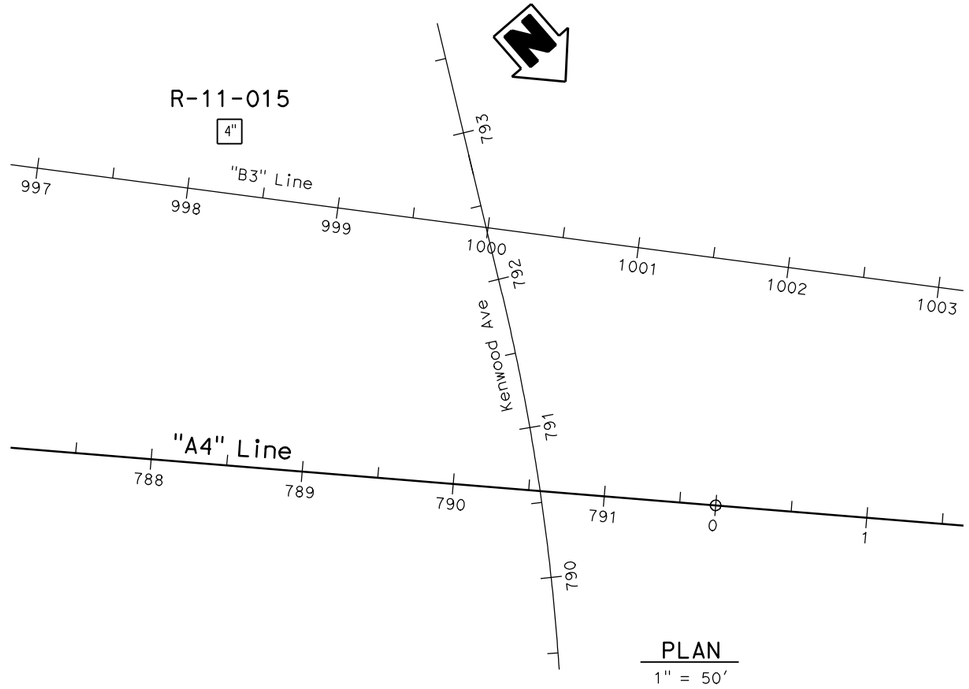
PROFILE
Horiz: 1" = 10'
Vert: 1" = 10'

Note: No ground water encountered during field investigation.

BENCH MARK

PNO 173 2120.910
FD STD Brass disk in concrete stamped "SBD-215-173 1988" 40' Ely of EOD Devore Rd Bridge at Nly end bridge; 70' Nly of EP NB SBD 215 at PM 17.3 at top of slope.

PNO 2010 2179.090
FD STD Brass disk in concrete stamped "D8 SCN SBD-15 PM 16.3 08.04.08" At top of slope SOUTH of Connector Bridge from NB SBD 15 to NB SBD 215.



PLAN
1" = 50'

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SB TRUCK BYPASS/SB 215 MAINLINE
FUNCTIONAL SUPERVISOR	DRAWN BY: W. Tang 06/11		DESIGN BRANCH X	54-NEW	LOG OF TEST BORINGS 1 OF 3
NAME: A. Perez-Cobo	CHECKED BY: B. Levine/S. Logeswaran	FIELD INVESTIGATION BY: D. Cook		POST MILE R14.94	

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003661 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
09-06-11	10-06-11			X	X

FILE => sb-truck-bypass1of3.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:52

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

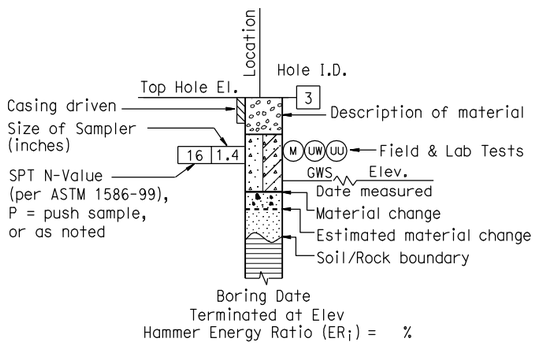
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

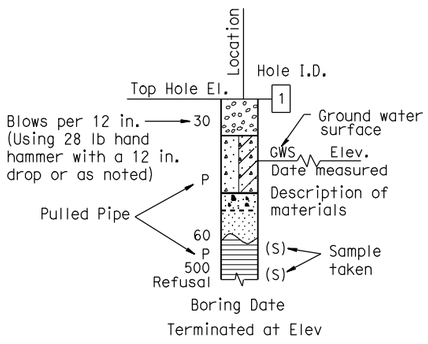
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

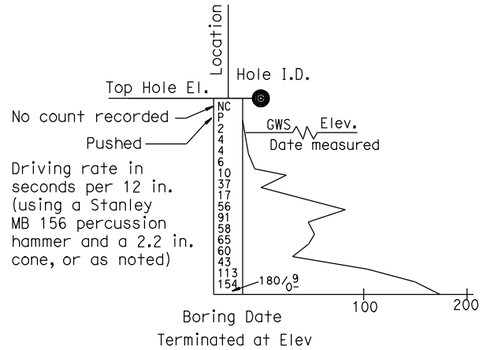
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



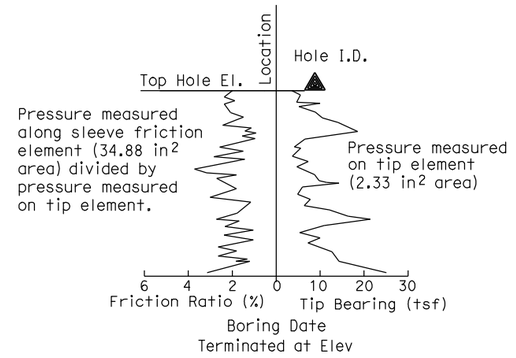
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SB TRUCK BYPASS/SB 215 MAINLINE
	PREPARED BY: W. Tang 06/11		DESIGN BRANCH X	54-NEW POST MILE R14.94	LOG OF TEST BORINGS 2 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003661 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
				X	X

FILE => sb-truck-bypass2of3.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:52

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly-graded GRAVEL Poorly-graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly-graded GRAVEL with SILT Poorly-graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly-graded GRAVEL with CLAY (or SILTY CLAY) Poorly-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly-graded SAND Poorly-graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly-graded SAND with SILT Poorly-graded SAND with SILT and GRAVEL		
SP-SC	Poorly-graded SAND with CLAY (or SILTY CLAY) Poorly-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 in.)
Very Loose	0 - 5
Loose	5 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	Greater than 50

MOISTURE

Description	Criteria
Dry	No discernable moisture
Moist	Moisture present, but no free water
Wet	Visible free water

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5% - 10%
Little	15% - 25%
Some	30% - 45%
Mostly	50% - 100%

PARTICLE SIZE

Description		Size (in.)
Boulder		Greater than 12
Cobble		3 - 12
Gravel	Coarse	3/4 - 3
	Fine	1/5 - 3/4
Sand	Coarse	1/16 - 1/5
	Medium	1/64 - 1/16
	Fine	1/300 - 1/64
Silt and Clay		Less than 1/300

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SB TRUCK BYPASS/SB 215 MAINLINE
	PREPARED BY: W. Tang 06/11		DESIGN BRANCH X	54-NEW POST MILE R14.94	LOG OF TEST BORINGS 3 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003661 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-26-11				X	X

FILE => sb-truck-bypass3of3.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:52

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST
K. Douglas Cook
No. 1391
Exp. 12-31-11
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

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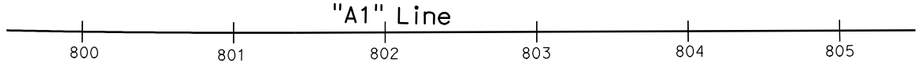
This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

BENCH MARK

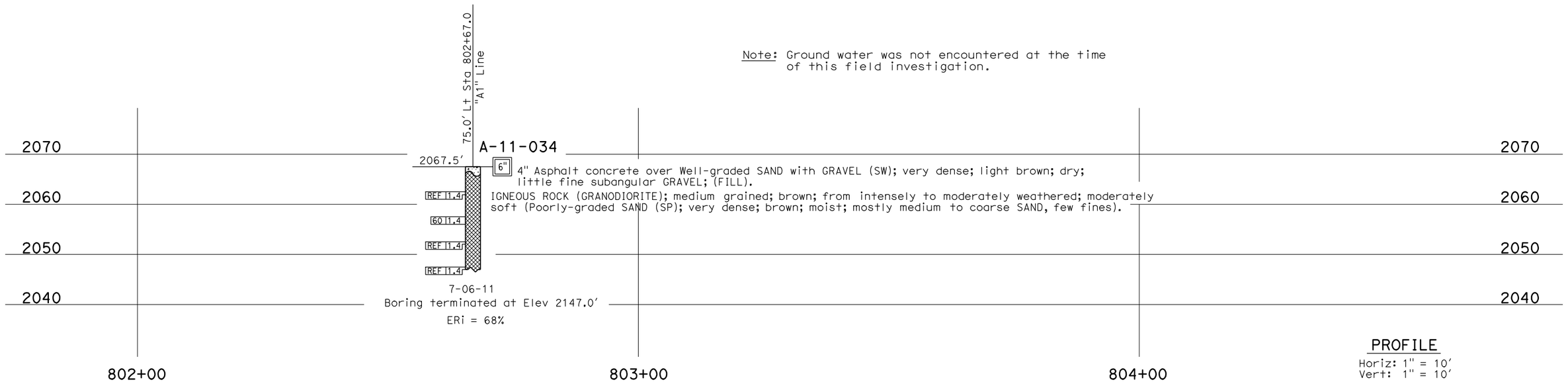
Set TBM on top of drain grate
80 ft Lt "A1" Line Sta 802+50.0
at assumed Elev 2067.0 ft (Topo).

A-11-034
6"



PLAN
1" = 50'

Note: Ground water was not encountered at the time of this field investigation.



PROFILE
Horiz: 1" = 10'
Vert: 1" = 10'

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SIGN POST SB I-15 AT 15.20
FUNCTIONAL SUPERVISOR	DRAWN BY: F. Nguyen 9/11	FIELD INVESTIGATION BY:	DESIGN BRANCH X	NEW	
NAME: A. Perez-Cobo	CHECKED BY: B. Levine	D. Cook		POST MILE 15.20	LOG OF TEST BORINGS 1 OF 4

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
~~09-26-11~~	10-20-11			X	X

FILE => sgnpst1-1of4.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:21

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

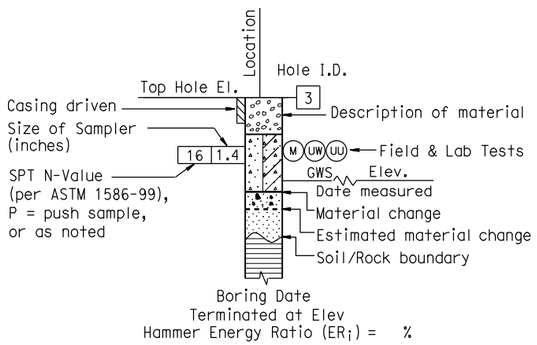
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

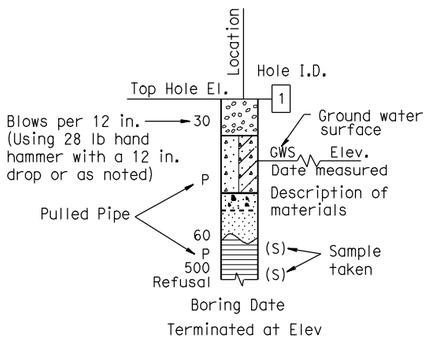
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

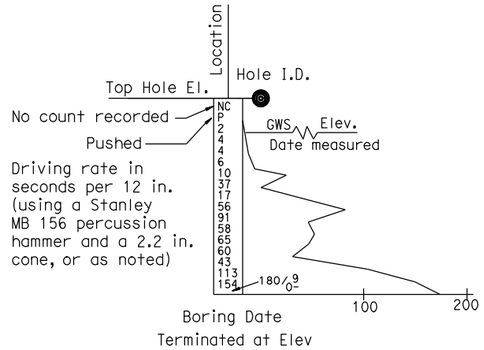
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



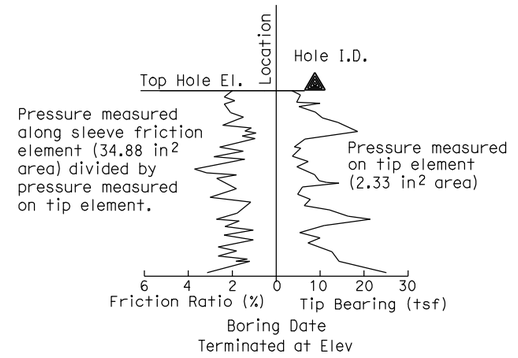
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SIGN POST SB I-15 AT 15.20
	PREPARED BY: F. Nguyen 9/11		DESIGN BRANCH X	NEW POST MILE 15.20	LOG OF TEST BORINGS 2 OF 4

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES				SHEET	OF
~~09-26-11~~	10-20-11			X	X

FILE => sgnpst1-2of4.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:21

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SIGN POST SB I-15 AT 15.20
	PREPARED BY: F. Nguyen 9/11		DESIGN BRANCH X	NEW	LOG OF TEST BORINGS 3 OF 4
				POST MILE 15.20	

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-26-11	10-20-11			X	X

FILE => sgnpst1-3of4.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:21

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

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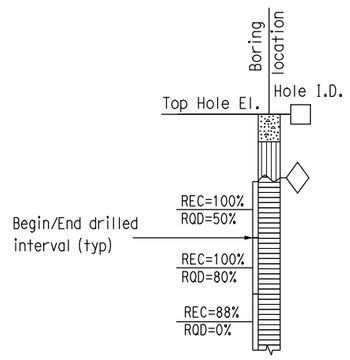
PROFESSIONAL GEOLOGIST — K. Douglas Cook No. 1391 Exp. 12-31-11 CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

$$REC = \frac{\sum \text{Length of the recovered core pieces (in.)}}{\text{Total length of core run (in.)}} \times 100\%$$

$$RQD = \frac{\sum \text{Length of intact core pieces} \geq 4 \text{ in.}}{\text{Total length of core run (in.)}} \times 100\%$$

RQD* Indicates soundness criteria not met.



BEDDING SPACING

Description	Thickness / Spacing
Massive	Greater than 10 ft
Very Thickly Bedded	3 ft - 10 ft
Thickly Bedded	1 ft - 3 ft
Moderately Bedded	4 in. - 1 ft
Thinly Bedded	1 in. - 4 in.
Very Thinly Bedded	1/4 in. - 1 in.
Laminated	Less than 1/4 in.

LEGEND OF ROCK MATERIALS

- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

ROCK HARDNESS

Description	Criteria
Extremely Hard	Cannot be scratched with a pocketknife or sharp pick. Can only be chipped with repeated heavy hammer blows.
Very Hard	Cannot be scratched with a pocketknife or sharp pick. Breaks with repeated heavy hammer blows.
Hard	Can be scratched with a pocketknife or sharp pick with difficulty (heavy pressure). Breaks with heavy hammer blows.
Moderately Hard	Can be scratched with pocketknife or sharp pick with light or moderate pressure. Breaks with moderate hammer blows.
Moderately Soft	Can be grooved 1/16 in. deep with a pocketknife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Can be grooved or gouged easily by a pocketknife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.
Very Soft	Can be readily indented, grooved or gouged with fingernail, or carved with a pocketknife. Breaks with light manual pressure.

FRACTURE DENSITY

Description	Observed Fracture Density
Unfractured	No fractures.
Very Slightly Fractured	Core lengths greater than 3 ft.
Slightly Fractured	Core lengths mostly from 1 to 3 ft.
Moderately Fractured	Core lengths mostly from 4 in. to 1 ft.
Intensely Fractured	Core lengths mostly from 1 to 4 in.
Very Intensely Fractured	Mostly chips and fragments.

WEATHERING DESCRIPTORS FOR INTACT ROCK

Description	Diagnostic Features					General Characteristics
	Chemical Weathering-Discoloration and/or Oxidation		Mechanical Weathering-Grain Boundary Conditions (Disaggregation) Primarily for Granitics and Some Coarse-Grained Sediments	Texture and Leaching		
	Body of Rock	Fracture Surfaces		Texture	Leaching	
Fresh	No discoloration, not oxidized.	No discoloration or oxidation.	No separation, intact (tight).	No change	No leaching	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull.	Minor to complete discoloration or oxidation of most surfaces.	No visible separation, intact (tight).	Preserved	Minor leaching of some soluble minerals.	Hammer rings when crystalline rocks are struck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty," feldspar crystals are "cloudy."	All fracture surfaces are discolored or oxidized.	Partial separation of boundaries visible.	Generally preserved	Soluble minerals may be mostly leached.	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weathered	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in-situ disaggregation, see grain boundary conditions.	All fracture surfaces are discolored or oxidized, surfaces friable.	Partial separation, rock is friable; in semiarid conditions granitics are disaggregated.	Texture altered by chemical disintegration (hydration, argillation).	Leaching of soluble minerals may be complete.	Dull sound when struck with hammer, usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures, or veinlets. Rock is significantly weakened.
Decomposed	Discolored or oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay.		Complete separation of grain boundaries (disaggregated).	Resembles a soil, partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete.		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes."

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SIGN POST SB I-15 AT 15.20
	PREPARED BY: F. Nguyen 9/11		DESIGN BRANCH X	NEW POST MILE 15.20	LOG OF TEST BORINGS 4 OF 4

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-26-11	10-20-11			X	X

FILE => sgnpst1-4of4.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:21

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST
K. Douglas Cook
No. 1391
Exp. 12-31-11
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

PLANS APPROVAL DATE

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This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

BENCH MARK

Set TBM SWC Bridge 54-0780L
71 ft Lt Sta 839+15 "A3" Line
at assumed Elev 2120.0 ft
NAVD 1988.

N

A-11-035
6"

"A3" Line
832 833 834 835 836 837

PLAN
1" = 50'

62.0' Lt Sta 834+50.0
"A3" Line

Note: Ground water was not encountered at the time of this field investigation.

2104.0'

A-11-035
6" 4" Asphalt concrete over SILTY SAND (SM); yellowish brown; moist; (FILL).

Well-graded SAND with SILT (SW-SM); dense; mottled light brown and light gray; dry; (FILL).

-very dense.
-light yellowish brown; moist.
-dense.

31 11.4
47 11.4
38 11.4
29 11.4
36 11.4
32 11.4

7-06-11
Boring terminated at Elev 2072.5'
ERi = 68%

2110
2100
2090
2080

834+00 835+00 836+00

PROFILE
Horiz: 1" = 10'
Vert: 1" = 10'

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SIGN POST SB I-15 AT 15.80
FUNCTIONAL SUPERVISOR	DRAWN BY: F. Nguyen 9/11		DESIGN BRANCH X	NEW	
NAME: A. Perez-Cobo	CHECKED BY: B. Levine	FIELD INVESTIGATION BY: D. Cook		POST MILE 15.80	LOG OF TEST BORINGS 1 OF 3

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
~~09-26-11~~	10-20-11			X	X

FILE => sgnpst2-1of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:20

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
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PLANS APPROVAL DATE

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

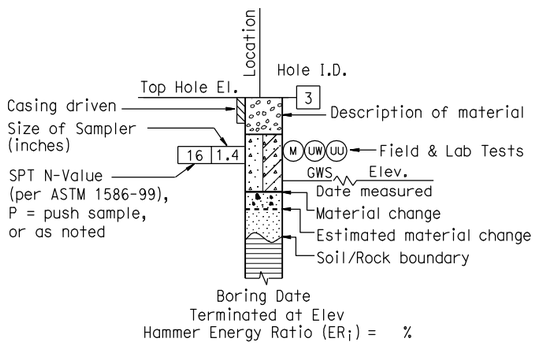
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

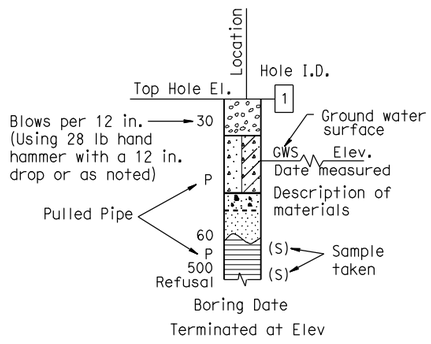
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

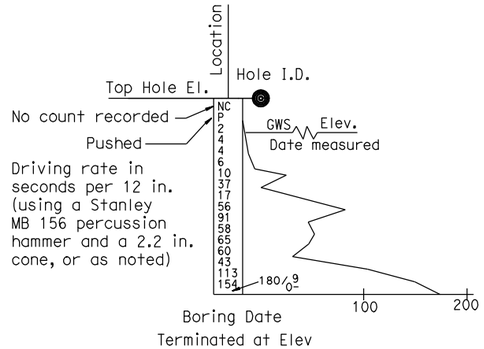
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



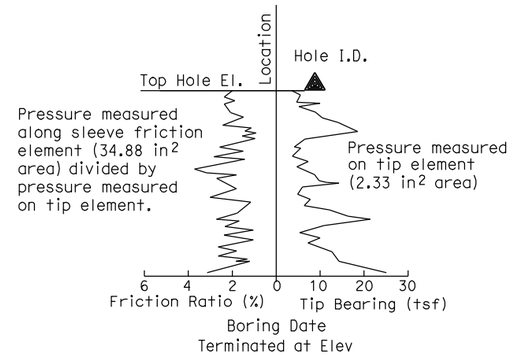
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SIGN POST SB I-15 AT 15.80
	PREPARED BY: F. Nguyen 9/11		DESIGN BRANCH X	NEW POST MILE 15.80	LOG OF TEST BORINGS 2 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
				X	X

FILE => sgnpst2-2of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:21

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
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- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-24-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook No. 1391 Exp. 12-31-11 CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SIGN POST SB I-15 AT 15.80
	PREPARED BY: F. Nguyen 9/11		DESIGN BRANCH X	NEW	LOG OF TEST BORINGS 3 OF 3
				POST MILE 15.80	

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES					SHEET	OF
					X	X

FILE => sgnpst2-3of3.dgn

USERNAME => s128198 DATE PLOTTED => 25-OCT-2011 TIME PLOTTED => 08:21

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	215			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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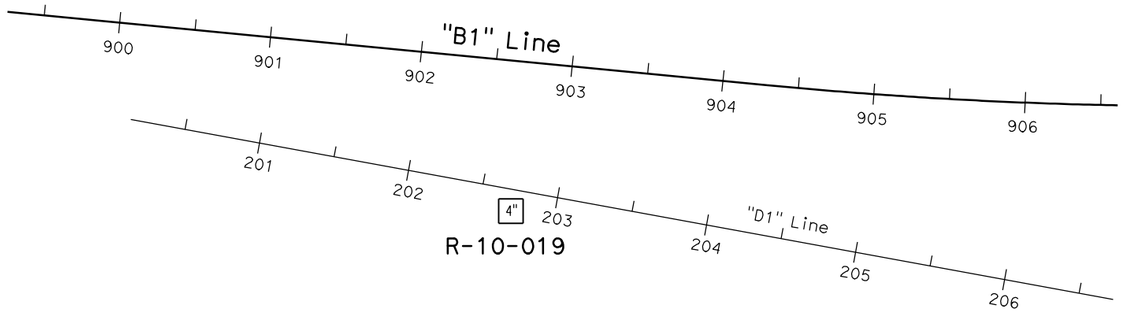
This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

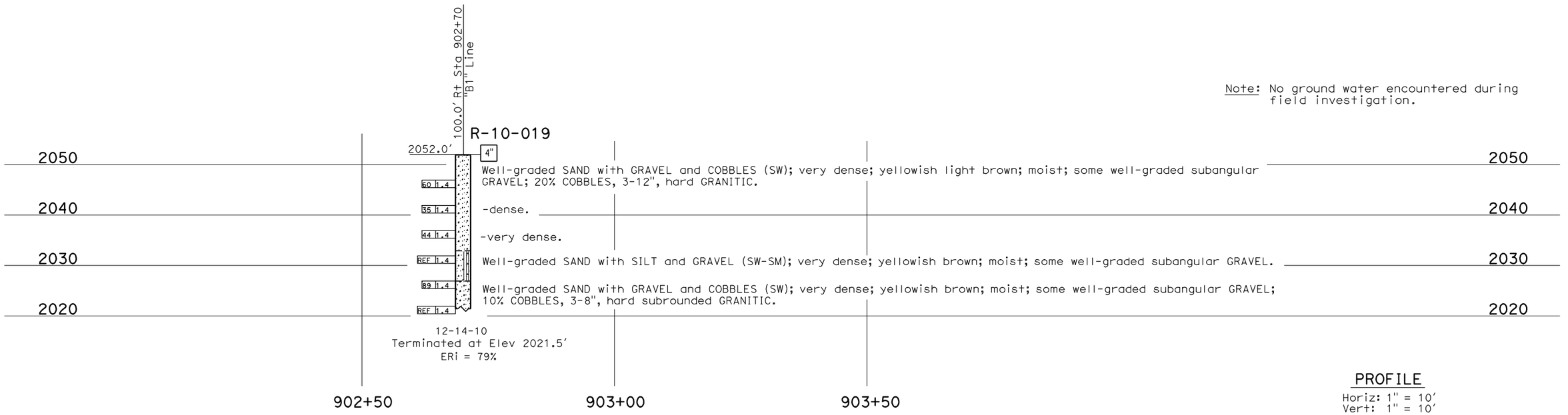
BENCH MARK

PNO 173 2120.910
FD STD Brass disk in concrete stamped "SBD-215-173 1988" 40′ Ely of EOD Devore Rd Bridge at Nly end bridge; 70′ Nly of EP NB SBD 215 at PM 17.3 at top of slope.

PNO 2010 2179.090
FD STD Brass disk in concrete stamped "D8 SCN SBD-15 PM 16.3 08.04.08" At top of slope SOUTH of Connector Bridge from NB SBD 15 to NB SBD 215.



PLAN
1" = 50′



Note: No ground water encountered during field investigation.

PROFILE
Horiz: 1" = 10′
Vert: 1" = 10′

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SIGN POST
FUNCTIONAL SUPERVISOR	DRAWN BY: W. Tang 06/11	FIELD INVESTIGATION BY:	DESIGN BRANCH X	New	
NAME: A. Perez-Cobo	CHECKED BY: B. Levine/S. Logeswaran	D. Cook		POST MILE 17.1	LOG OF TEST BORINGS 1 OF 3

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
09-02-11				X	X

FILE => sign-post1of3.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:52

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

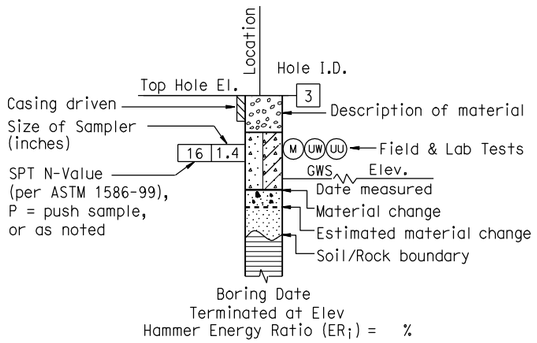
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

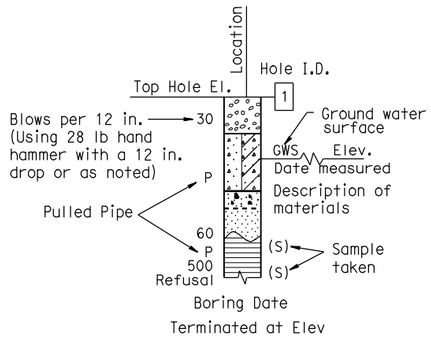
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

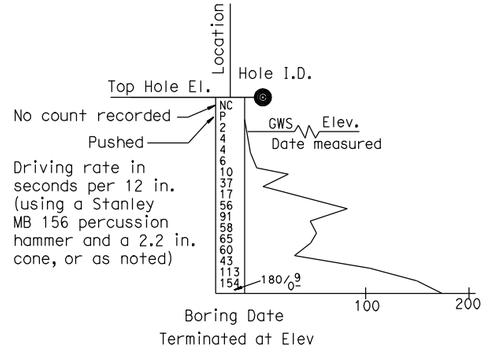
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



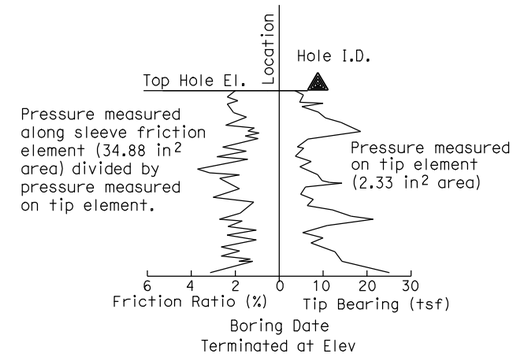
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	SIGN POST
	PREPARED BY: W. Tang 06/11		DESIGN BRANCH X	NEW POST MILE 17.3	LOG OF TEST BORINGS 2 OF 3

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003661 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
				X	X

FILE => sign-post2of3.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:52

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly-graded GRAVEL Poorly-graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly-graded GRAVEL with SILT Poorly-graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly-graded GRAVEL with CLAY (or SILTY CLAY) Poorly-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly-graded SAND Poorly-graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly-graded SAND with SILT Poorly-graded SAND with SILT and GRAVEL		
SP-SC	Poorly-graded SAND with CLAY (or SILTY CLAY) Poorly-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 in.)
Very Loose	0 - 5
Loose	5 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	Greater than 50

MOISTURE

Description	Criteria
Dry	No discernable moisture
Moist	Moisture present, but no free water
Wet	Visible free water

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5% - 10%
Little	15% - 25%
Some	30% - 45%
Mostly	50% - 100%

PARTICLE SIZE

Description		Size (in.)
Boulder		Greater than 12
Cobble		3 - 12
Gravel	Coarse	3/4 - 3
	Fine	1/5 - 3/4
Sand	Coarse	1/16 - 1/5
	Medium	1/64 - 1/16
	Fine	1/300 - 1/64
Silt and Clay		Less than 1/300

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN DESIGN BRANCH X	BRIDGE NO. NEW / POST MILE 17.3	SIGN POST LOG OF TEST BORINGS 3 OF 3
	PREPARED BY: W. Tang 06/11				

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003661 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES					SHEET	OF
					X	X

FILE => sign-post3of3.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 12:53

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	215			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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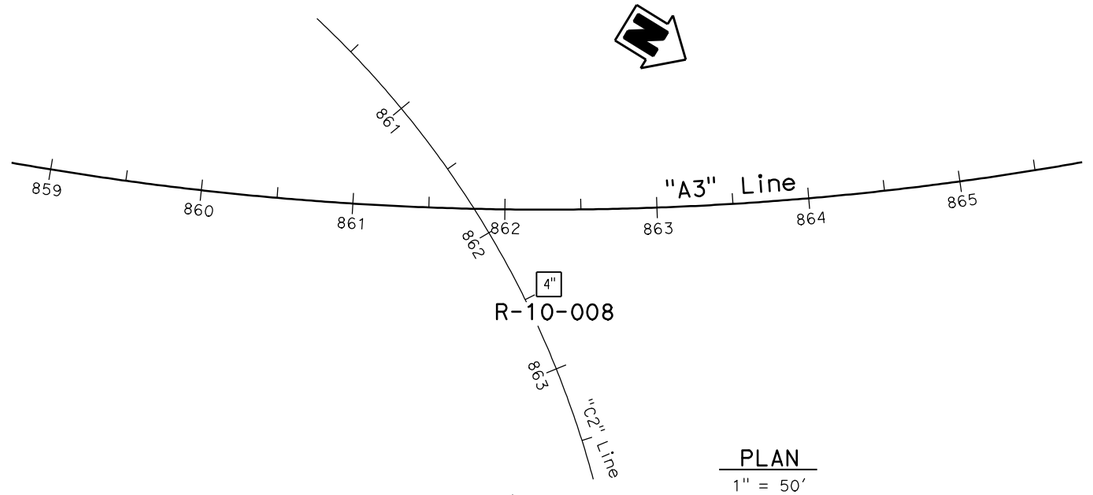
This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

BENCH MARK

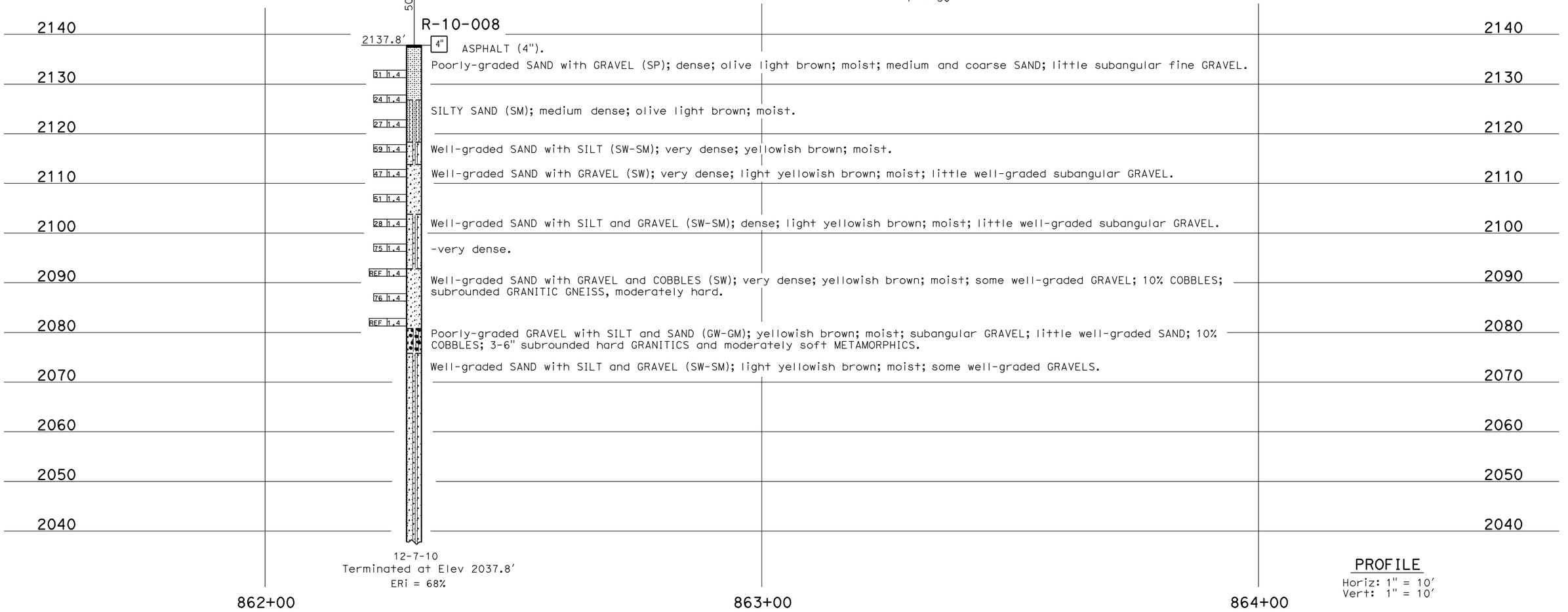
PNO 173 2120.910
FD STD Brass disk in concrete stamped "SBD-215-173 1988" 40′ Ely of EOD Devore Rd Bridge at NIy end bridge; 70′ NIy of EP NB SBD 215 at PM 17.3 at top of slope.

PNO 2010 2179.090
FD STD Brass disk in concrete stamped "D8 SCN SBD-15 PM 16.3 08.04.08" At top of slope SOUTH of Connector Bridge from NB SBD 15 to NB SBD 215.



PLAN
1" = 50′

Note: No ground water encountered during field investigation.



12-7-10
Terminated at Elev 2037.8′
ERi = 68%

PROFILE
Horiz: 1" = 10′
Vert: 1" = 10′

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	WEST CONNECTOR (WIDEN)
FUNCTIONAL SUPERVISOR	DRAWN BY: W. Tang 06/11	FIELD INVESTIGATION BY:	DESIGN BRANCH X	54-0782L	LOG OF TEST BORINGS 1 OF 4
NAME: A. Perez-Cobo	CHECKED BY: B. Levine/S. Logeswaran	M. Wilson		POST MILE 16.32	

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003661 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES	SHEET	OF
09-07-11	X	X

FILE => w-conn-widen1of4.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 13:25

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

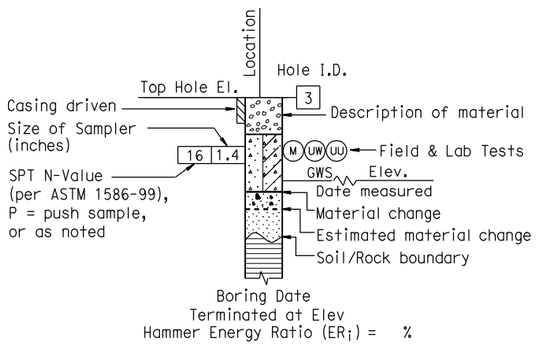
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

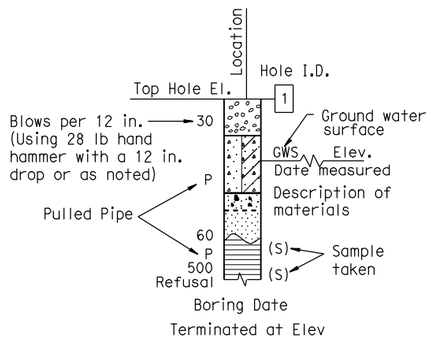
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

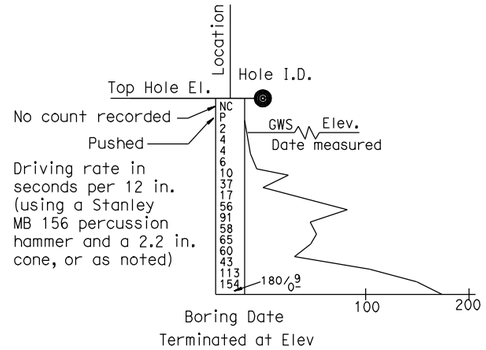
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



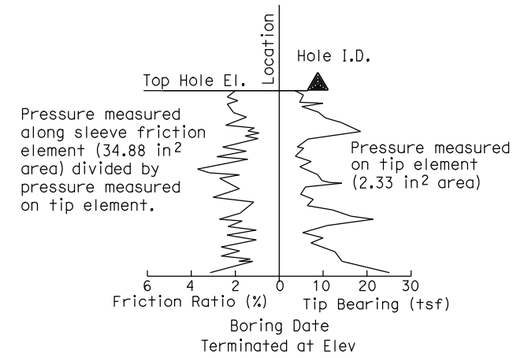
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	WEST CONNECTOR (WIDEN)
	PREPARED BY: F. Nguyen 10/11		DESIGN BRANCH X	54-0782L POST MILE 16.32	LOG OF TEST BORINGS 2 OF 4

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES					SHEET	OF
					X	X

FILE => w-conn-widen2of4.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 13:25

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (JUNE 2007)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly graded GRAVEL Poorly graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly graded GRAVEL with SILT Poorly graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly graded GRAVEL with CLAY (or SILTY CLAY) Poorly graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly graded SAND Poorly graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly graded SAND with SILT Poorly graded SAND with SILT and GRAVEL		
SP-SC	Poorly graded SAND with CLAY (or SILTY CLAY) Poorly graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (PP) Pocket Penetrometer
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (TV) Pocket Torvane
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)
- (VS) Vane Shear (AASHTO T 223)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 inches)
Very loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	> 50

MOISTURE

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

PARTICLE SIZE

Description		Size
Boulder		> 12"
Cobble		3" to 12"
Gravel	Coarse	3/4" to 3"
	Fine	No. 4 to 3/4"
Sand	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	WEST CONNECTOR (WIDEN)
	PREPARED BY: F. Nguyen 10/11		DESIGN BRANCH X	54-0782L POST MILE 16.32	LOG OF TEST BORINGS 3 OF 4

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003660 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES					SHEET	OF
					X	X

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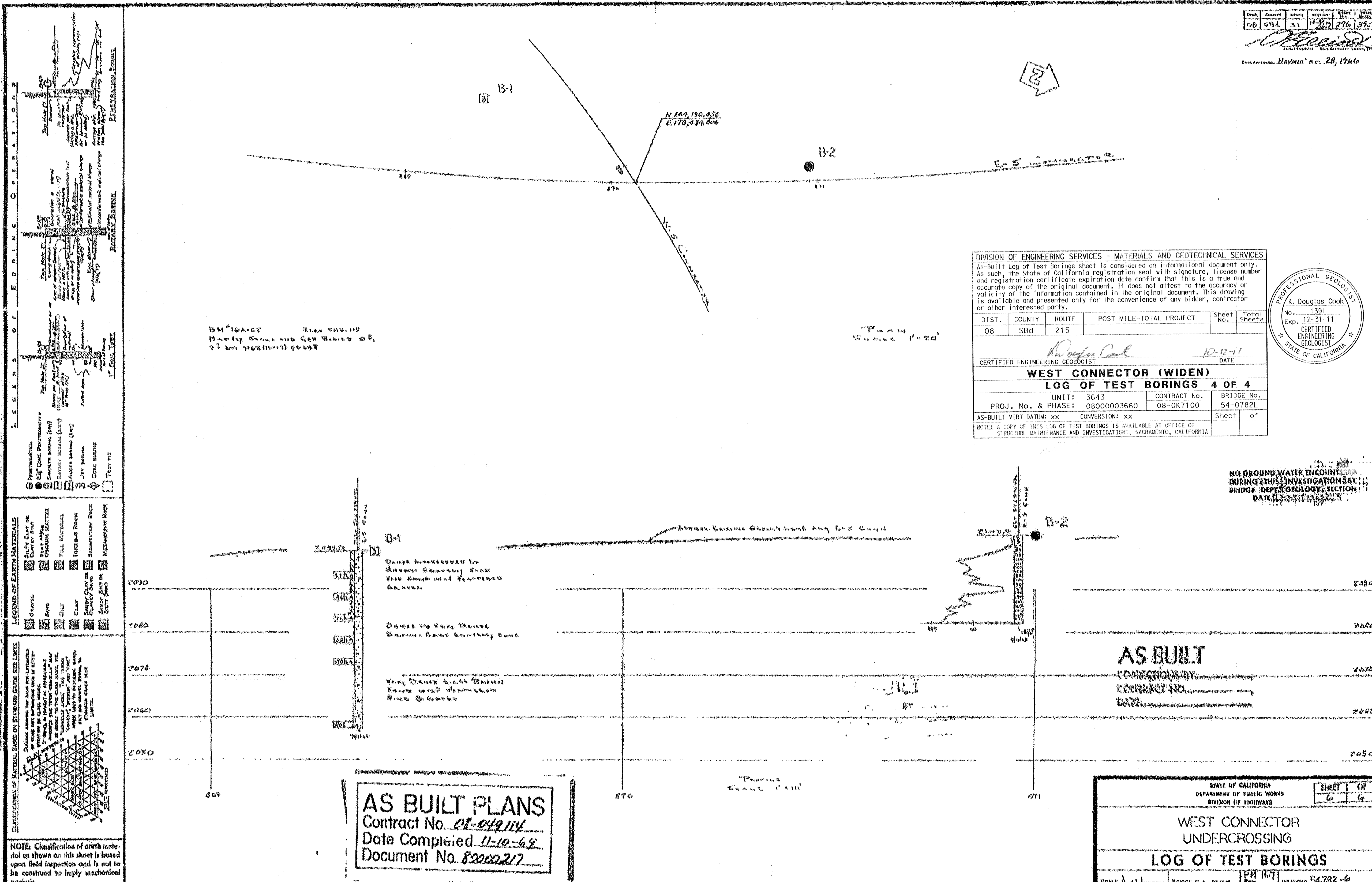
USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 13:26



NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

Date Approved: November 28, 1966

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

As-Built Log of Test Borings sheet is considered an informational document only. As such, the State of California registration seal with signature, license number and registration certificate expiration date confirm that this is a true and accurate copy of the original document. It does not attest to the accuracy or validity of the information contained in the original document. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party.

DIST.	COUNTY	ROUTE	POST MILE-TOTAL PROJECT	Sheet No.	Total Sheets
08	SBd	215			

K. Douglas Cook — CERTIFIED ENGINEERING GEOLOGIST — DATE 10-12-11

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

WEST CONNECTOR (WIDEN)

LOG OF TEST BORINGS 4 OF 4

UNIT: 3643
PROJ. No. & PHASE: 08000003660
CONTRACT No. 08-0K7100
BRIDGE No. 54-0782L

AS-BUILT VERT DATUM: xx CONVERSION: xx — Sheet of

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

AS BUILT

AS BUILT PLANS
Contract No. 08-049114
Date Completed 11-10-69
Document No. 83000217

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

SHEET 6 OF 6

WEST CONNECTOR UNDERCROSSING

LOG OF TEST BORINGS

SCALE As Noted — BRIDGE 54-782 — PM 16.7 — DRAWING 54782-6

296

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	215			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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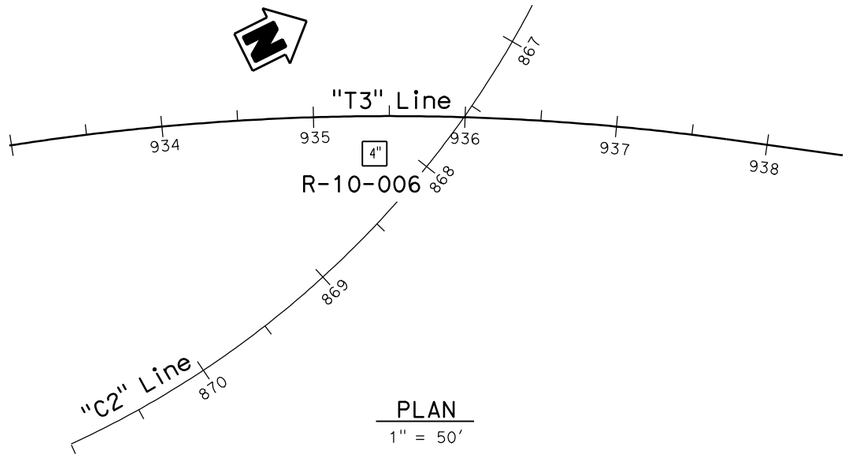
This LOTB sheet was prepared in accordance with the Caltrans Soil & Rock Logging, Classification, & Presentation Manual (2010 Edition).

BENCH MARK

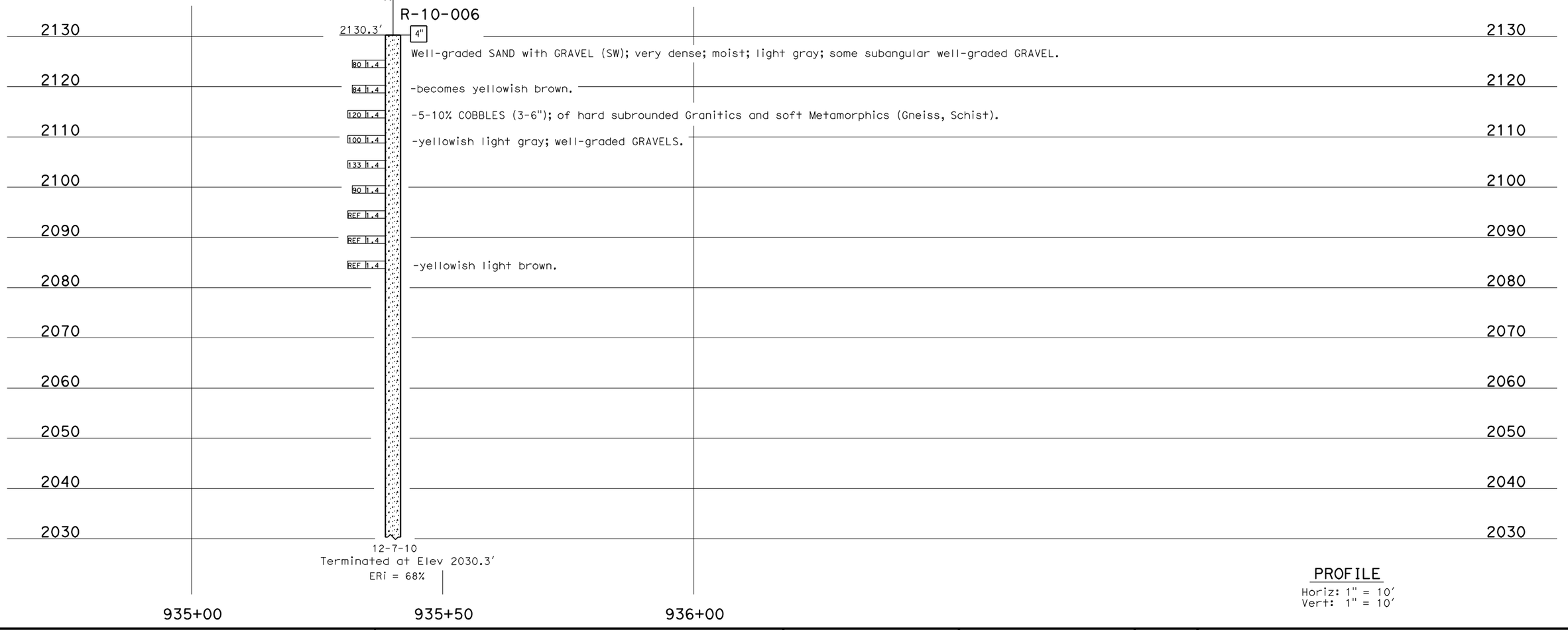
PNO 173 2120.910
FD STD Brass disk in concrete stamped "SBD-215-173 1988" 40′ Ely of EOD Devore Rd Bridge at Nly end bridge; 70′ Nly of EP NB SBD 215 at PM 17.3 at top of slope.

PNO 2010 2179.090
FD STD Brass disk in concrete stamped "D8 SCN SBD-15 PM 16.3 08.04.08" At top of slope SOUTH of Connector Bridge from NB SBD 15 to NB SBD 215.



PLAN
1" = 50′

Note: No ground water encountered during field investigation.



PROFILE
Horiz: 1" = 10′
Vert: 1" = 10′

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	W-S CONNECTOR UC (WIDEN)
FUNCTIONAL SUPERVISOR	DRAWN BY: W. Tang 06/11	FIELD INVESTIGATION BY:	DESIGN BRANCH X	NEW	LOG OF TEST BORINGS 1 OF 5
NAME: A. Perez-Cobo	CHECKED BY: B. Levine/S. Logeswaran	D. Cook		POST MILE 17.18	

OGS CIVIL LOG OF TEST BORINGS SHEET

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 080000003661 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
09-07-11				X	X

FILE => wsconn-uc-widen1of 5.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 14:25

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

PLANS APPROVAL DATE

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CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

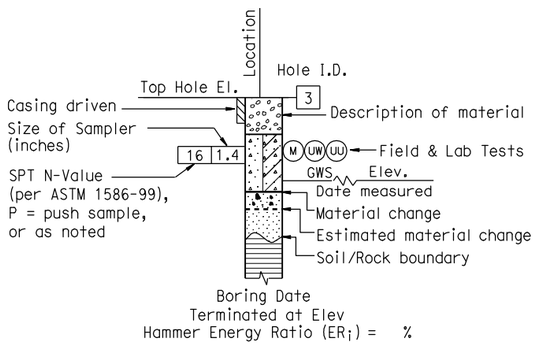
BOREHOLE IDENTIFICATION

Symbol	Hole Type	Description
Size	A	Auger Boring (hollow or solid stem bucket)
Size	R RW RC P	Rotary drilled boring (conventional) Rotary drilled with self-casing wire-line Rotary core with continuously-sampled, self-casing wire-line Rotary percussion boring (air)
Size	R	Rotary drilled diamond core
Size	HD HA	Hand driven (1-inch soil tube) Hand Auger
●	D	Dynamic Cone Penetration Boring
▲	CPT	Cone Penetration Test (ASTM D 5778)
⬚	O	Other (note on LOTB)

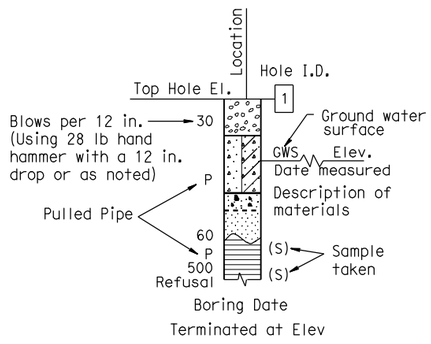
Note: Size in inches.

CONSISTENCY OF COHESIVE SOILS

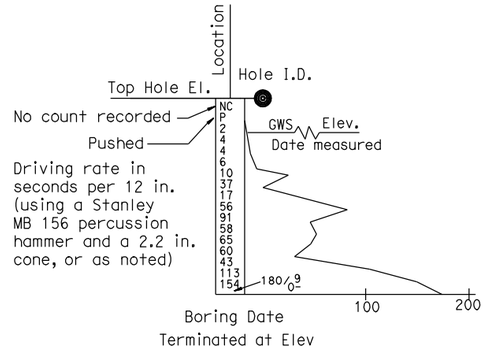
Description	Shear Strength (tsf)	Pocket Penetrometer Measurement, PP, (tsf)	Torvane Measurement, TV, (tsf)	Vane Shear Measurement, VS, (tsf)
Very Soft	Less than 0.12	Less than 0.25	Less than 0.12	Less than 0.12
Soft	0.12 - 0.25	0.25 - 0.5	0.12 - 0.25	0.12 - 0.25
Medium Stiff	0.25 - 0.5	0.5 - 1	0.25 - 0.5	0.25 - 0.5
Stiff	0.5 - 1	1 - 2	0.5 - 1	0.5 - 1
Very Stiff	1 - 2	2 - 4	1 - 2	1 - 2
Hard	Greater than 2	Greater than 4	Greater than 2	Greater than 2



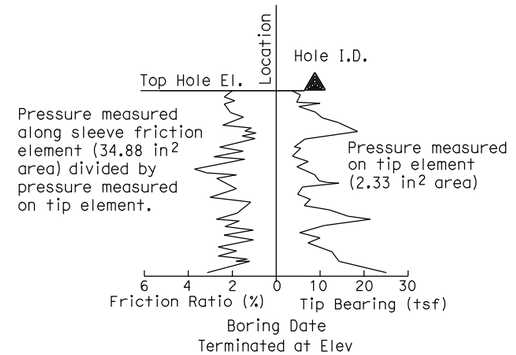
ROTARY BORING



HAND BORING



DYNAMIC CONE PENETRATION BORING



CONE PENETRATION TEST (CPT) BORING

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	W-S CONNECTOR UC (WIDEN)
	PREPARED BY: W. Tang 06/11		DESIGN BRANCH X	NEW POST MILE 17.18	LOG OF TEST BORINGS 2 OF 5

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003661 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
				X	X

FILE => wsconn-uc-widen2of 5.dgn

USERNAME => s128198 DATE PLOTTED => 21-OCT-2011 TIME PLOTTED => 14:25

REFERENCE: CALTRANS SOIL & ROCK LOGGING, CLASSIFICATION, AND PRESENTATION MANUAL (2010)

GROUP SYMBOLS AND NAMES

Graphic/Symbol	Group Names	Graphic/Symbol	Group Names
GW	Well-graded GRAVEL Well-graded GRAVEL with SAND	CL	Lean CLAY Lean CLAY with SAND Lean CLAY with GRAVEL SANDY lean CLAY SANDY lean CLAY with GRAVEL GRAVELLY lean CLAY GRAVELLY lean CLAY with SAND
GP	Poorly-graded GRAVEL Poorly-graded GRAVEL with SAND		
GW-GM	Well-graded GRAVEL with SILT Well-graded GRAVEL with SILT and SAND	CL-ML	SILTY CLAY SILTY CLAY with SAND SILTY CLAY with GRAVEL SANDY SILTY CLAY SANDY SILTY CLAY with GRAVEL GRAVELLY SILTY CLAY GRAVELLY SILTY CLAY with SAND
GW-GC	Well-graded GRAVEL with CLAY (or SILTY CLAY) Well-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GP-GM	Poorly-graded GRAVEL with SILT Poorly-graded GRAVEL with SILT and SAND	ML	SILT SILT with SAND SILT with GRAVEL SANDY SILT SANDY SILT with GRAVEL GRAVELLY SILT GRAVELLY SILT with SAND
GP-GC	Poorly-graded GRAVEL with CLAY (or SILTY CLAY) Poorly-graded GRAVEL with CLAY and SAND (or SILTY CLAY and SAND)		
GM	SILTY GRAVEL SILTY GRAVEL with SAND	OL	ORGANIC lean CLAY ORGANIC lean CLAY with SAND ORGANIC lean CLAY with GRAVEL SANDY ORGANIC lean CLAY SANDY ORGANIC lean CLAY with GRAVEL GRAVELLY ORGANIC lean CLAY GRAVELLY ORGANIC lean CLAY with SAND
GC	CLAYEY GRAVEL CLAYEY GRAVEL with SAND		
GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL with SAND	OL	ORGANIC SILT ORGANIC SILT with SAND ORGANIC SILT with GRAVEL SANDY ORGANIC SILT SANDY ORGANIC SILT with GRAVEL GRAVELLY ORGANIC SILT GRAVELLY ORGANIC SILT with SAND
SW	Well-graded SAND Well-graded SAND with GRAVEL		
SP	Poorly-graded SAND Poorly-graded SAND with GRAVEL	CH	Fat CLAY Fat CLAY with SAND Fat CLAY with GRAVEL SANDY fat CLAY SANDY fat CLAY with GRAVEL GRAVELLY fat CLAY GRAVELLY fat CLAY with SAND
SW-SM	Well-graded SAND with SILT Well-graded SAND with SILT and GRAVEL		
SW-SC	Well-graded SAND with CLAY (or SILTY CLAY) Well-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	MH	Elastic SILT Elastic SILT with SAND Elastic SILT with GRAVEL SANDY elastic SILT SANDY elastic SILT with GRAVEL GRAVELLY elastic SILT GRAVELLY elastic SILT with SAND
SP-SM	Poorly-graded SAND with SILT Poorly-graded SAND with SILT and GRAVEL		
SP-SC	Poorly-graded SAND with CLAY (or SILTY CLAY) Poorly-graded SAND with CLAY and GRAVEL (or SILTY CLAY and GRAVEL)	OH	ORGANIC fat CLAY ORGANIC fat CLAY with SAND ORGANIC fat CLAY with GRAVEL SANDY ORGANIC fat CLAY SANDY ORGANIC fat CLAY with GRAVEL GRAVELLY ORGANIC fat CLAY GRAVELLY ORGANIC fat CLAY with SAND
SM	SILTY SAND SILTY SAND with GRAVEL		
SC	CLAYEY SAND CLAYEY SAND with GRAVEL	OH	ORGANIC elastic SILT ORGANIC elastic SILT with SAND ORGANIC elastic SILT with GRAVEL SANDY ORGANIC elastic SILT SANDY ORGANIC elastic SILT with GRAVEL GRAVELLY ORGANIC elastic SILT GRAVELLY ORGANIC elastic SILT with SAND
SC-SM	SILTY, CLAYEY SAND SILTY, CLAYEY SAND with GRAVEL		
PT	PEAT	OL/OH	ORGANIC SOIL ORGANIC SOIL with SAND ORGANIC SOIL with GRAVEL SANDY ORGANIC SOIL SANDY ORGANIC SOIL with GRAVEL GRAVELLY ORGANIC SOIL GRAVELLY ORGANIC SOIL with SAND
	COBBLES COBBLES and BOULDERS BOULDERS		

FIELD AND LABORATORY TESTING

- (C) Consolidation (ASTM D 2435)
- (CL) Collapse Potential (ASTM D 5333)
- (CP) Compaction Curve (CTM 216)
- (CR) Corrosivity Testing (CTM 643, CTM 422, CTM 417)
- (CU) Consolidated Undrained Triaxial (ASTM D 4767)
- (DS) Direct Shear (ASTM D 3080)
- (EI) Expansion Index (ASTM D 4829)
- (M) Moisture Content (ASTM D 2216)
- (OC) Organic Content-% (ASTM D 2974)
- (P) Permeability (CTM 220)
- (PA) Particle Size Analysis (ASTM D 422)
- (PI) Plasticity Index (AASHTO T 90) Liquid Limit (AASHTO T 89)
- (PL) Point Load Index (ASTM D 5731)
- (PM) Pressure Meter
- (R) R-Value (CTM 301)
- (SE) Sand Equivalent (CTM 217)
- (SG) Specific Gravity (AASHTO T 100)
- (SL) Shrinkage Limit (ASTM D 427)
- (SW) Swell Potential (ASTM D 4546)
- (UC) Unconfined Compression-Soil (ASTM D 2166) Unconfined Compression-Rock (ASTM D 2938)
- (UU) Unconsolidated Undrained Triaxial (ASTM D 2850)
- (UW) Unit Weight (ASTM D 4767)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No	TOTAL SHEETS
08	SBd	15			

K. Douglas Cook 10-12-11
CERTIFIED ENGINEERING GEOLOGIST

PLANS APPROVAL DATE

PROFESSIONAL GEOLOGIST — K. Douglas Cook No. 1391 Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

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APPARENT DENSITY OF COHESIONLESS SOILS

Description	SPT N_{60} (Blows / 12 in.)
Very Loose	0 - 5
Loose	5 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	Greater than 50

MOISTURE

Description	Criteria
Dry	No discernable moisture
Moist	Moisture present, but no free water
Wet	Visible free water

PERCENT OR PROPORTION OF SOILS

Description	Criteria
Trace	Particles are present but estimated to be less than 5%
Few	5% - 10%
Little	15% - 25%
Some	30% - 45%
Mostly	50% - 100%

PARTICLE SIZE

Description		Size (in.)
Boulder		Greater than 12
Cobble		3 - 12
Gravel	Coarse	3/4 - 3
	Fine	1/5 - 3/4
Sand	Coarse	1/16 - 1/5
	Medium	1/64 - 1/16
	Fine	1/300 - 1/64
Silt and Clay		Less than 1/300

ENGINEERING SERVICES	MATERIALS AND GEOTECHNICAL SERVICES	STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION	DIVISION OF ENGINEERING SERVICES STRUCTURE DESIGN	BRIDGE NO.	W-S CONNECTOR UC (WIDEN)
	PREPARED BY: W. Tang 06/11		DESIGN BRANCH X	NEW POST MILE 17.18	LOG OF TEST BORINGS 3 OF 5

GS LOTB SOIL LEGEND

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

UNIT: 3643
PROJECT NUMBER & PHASE: 08000003661 CONTRACT NO.: 08-0K7100

DISREGARD PRINTS BEARING EARLIER REVISION DATES →

REVISION DATES				SHEET	OF
08-26-11				X	X

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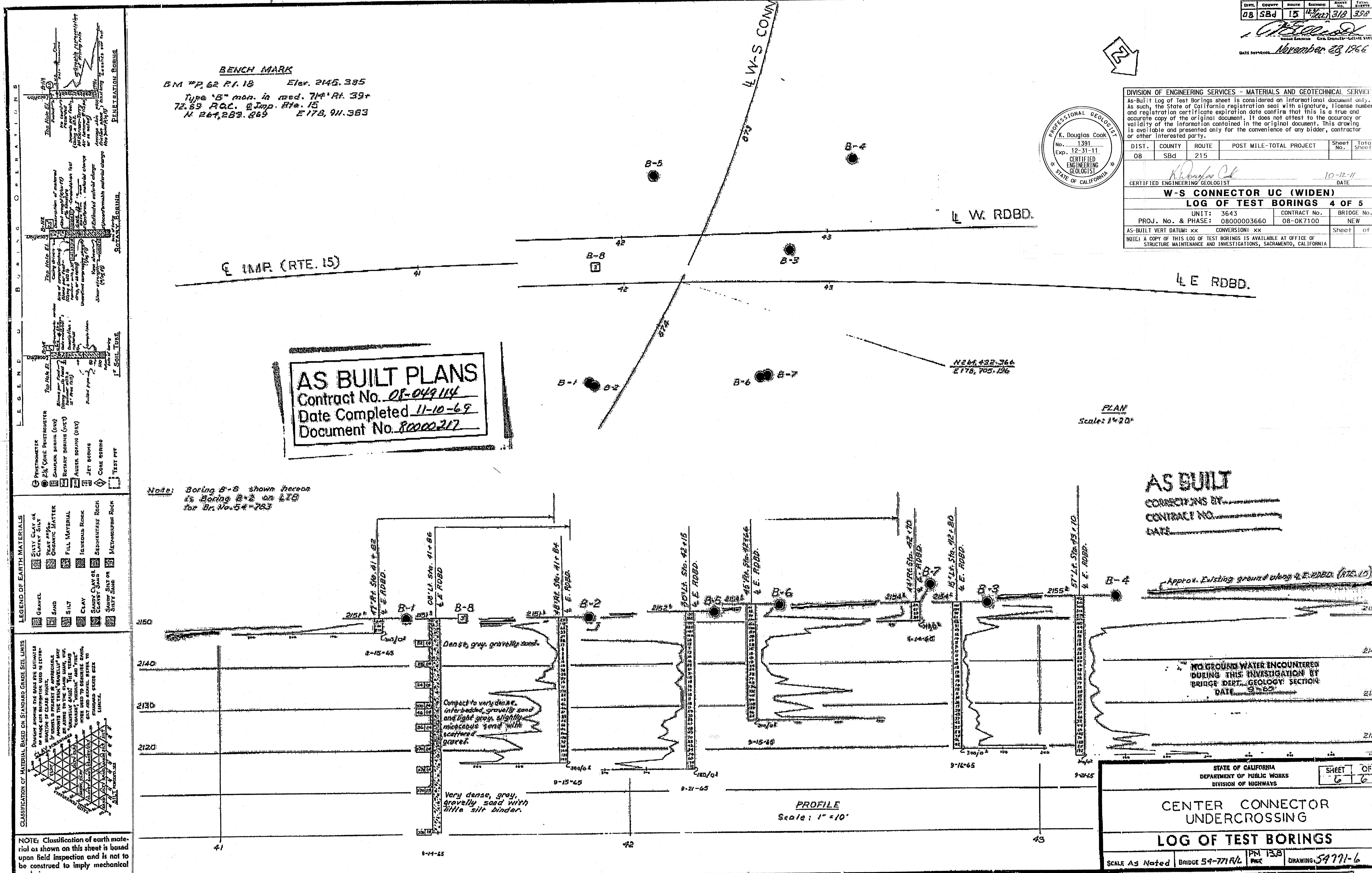

AS BUILT PLANS
Contract No. 08-049114
Date Completed 11-10-69
Document No. 80000217

FED. ROAD DIV. No.	STATE	F.A. PROJECT No.	SHEET No.	TOTAL SHEETS
7	CALIF.			

DIST.	COUNTY	ROUTE	SECTION	SHEET No.	TOTAL SHEETS
08	SBd	15		318	398

DATE APPROVED November 28, 1966

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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PROFESSIONAL GEOLOGIST K. Douglas Cook No. 1391 Exp. 12-31-11 CERTIFIED ENGINEERING GEOLOGIST STATE OF CALIFORNIA

DIST.	COUNTY	ROUTE	POST MILE-TOTAL PROJECT	Sheet No.	Total Sheets
08	SBd	215			

CERTIFIED ENGINEERING GEOLOGIST — DATE 10-12-11

W-S CONNECTOR UC (WIDEN)

LOG OF TEST BORINGS 4 OF 5

UNIT: 3643
PROJ. No. & PHASE: 08000003660
CONTRACT No. 08-0K7100
BRIDGE No. NEW

AS-BUILT VERT DATUM: xx CONVERSION: xx — Sheet of

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

BRIDGE DEPARTMENT
ENGINEERING GEOLOGY SECTION

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

SHEET 6 OF 6

CENTER CONNECTOR UNDERCROSSING

LOG OF TEST BORINGS

SCALE As Noted | BRIDGE 54-771 R/L | PM 13.8 | DRAWING 54771-6

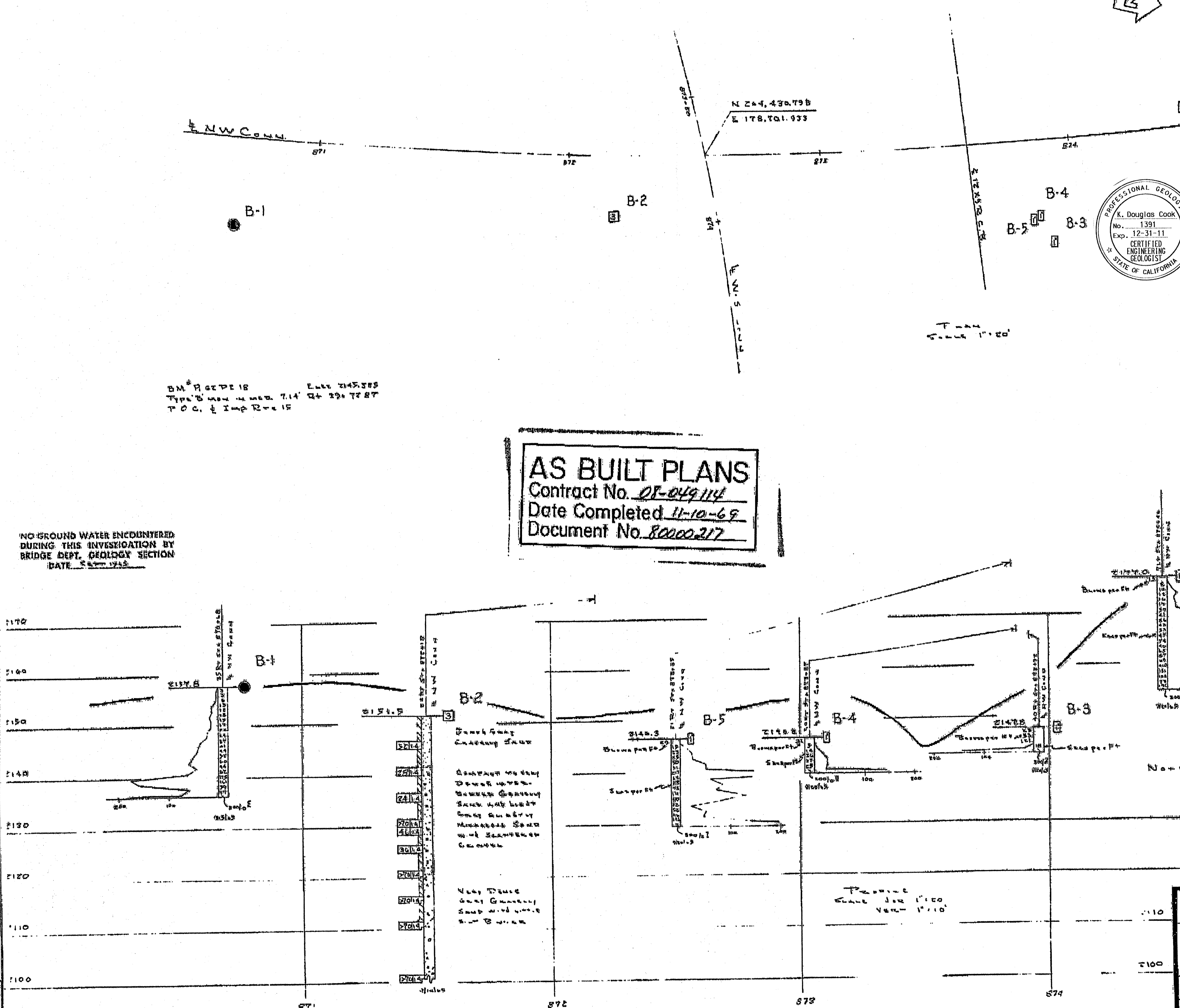
Charge: 08203
WA: 049111

Disregard prints bearing earlier numbers → PREL. DRAWING No. PR-

FED. ROAD DIV. NO.	STATE	F. A. PROJECT NO.	SHEET NO.	TOTAL SHEETS
7	CALIF.			

DIST.	COUNTY	ROUTE	SECTION	SHEET NO.	TOTAL SHEETS
08	SBd	31	15/16.7	303	595

DATE APPROVED November 28, 1966



AS BUILT PLANS
Contract No. 08-049114
Date Completed 11-10-69
Document No. 80000217

AS BUILT
CORRECTIONS BY
CONTRACT NO.
DATE

DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

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DIST.	COUNTY	ROUTE	POST MILE-TOTAL PROJECT	Sheet No.	Total Sheets
08	SBd	215			

PROFESSIONAL GEOLOGIST — K. Douglas Cook — No. 1391 — Exp. 12-31-11 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

CERTIFIED ENGINEERING GEOLOGIST — DATE 10-12-11

W-S CONNECTOR UC (WIDEN)

LOG OF TEST BORINGS 5 OF 5

UNIT: 3643
PROJ. No. & PHASE: 08000003660
CONTRACT No. 08-0K7100
BRIDGE No. NEW

AS-BUILT VERT DATUM: xx CONVERSION: xx

NOTE: A COPY OF THIS LOG OF TEST BORINGS IS AVAILABLE AT OFFICE OF STRUCTURE MAINTENANCE AND INVESTIGATIONS, SACRAMENTO, CALIFORNIA

LEGEND OF BORING OPERATIONS

LEGEND OF EARTH MATERIALS

CLASSIFICATION OF MATERIAL BASED ON STANDARD GRADE SIZE LIMITS

NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

SHEET 7 OF 7

ROUTE 31/15 SEPARATION

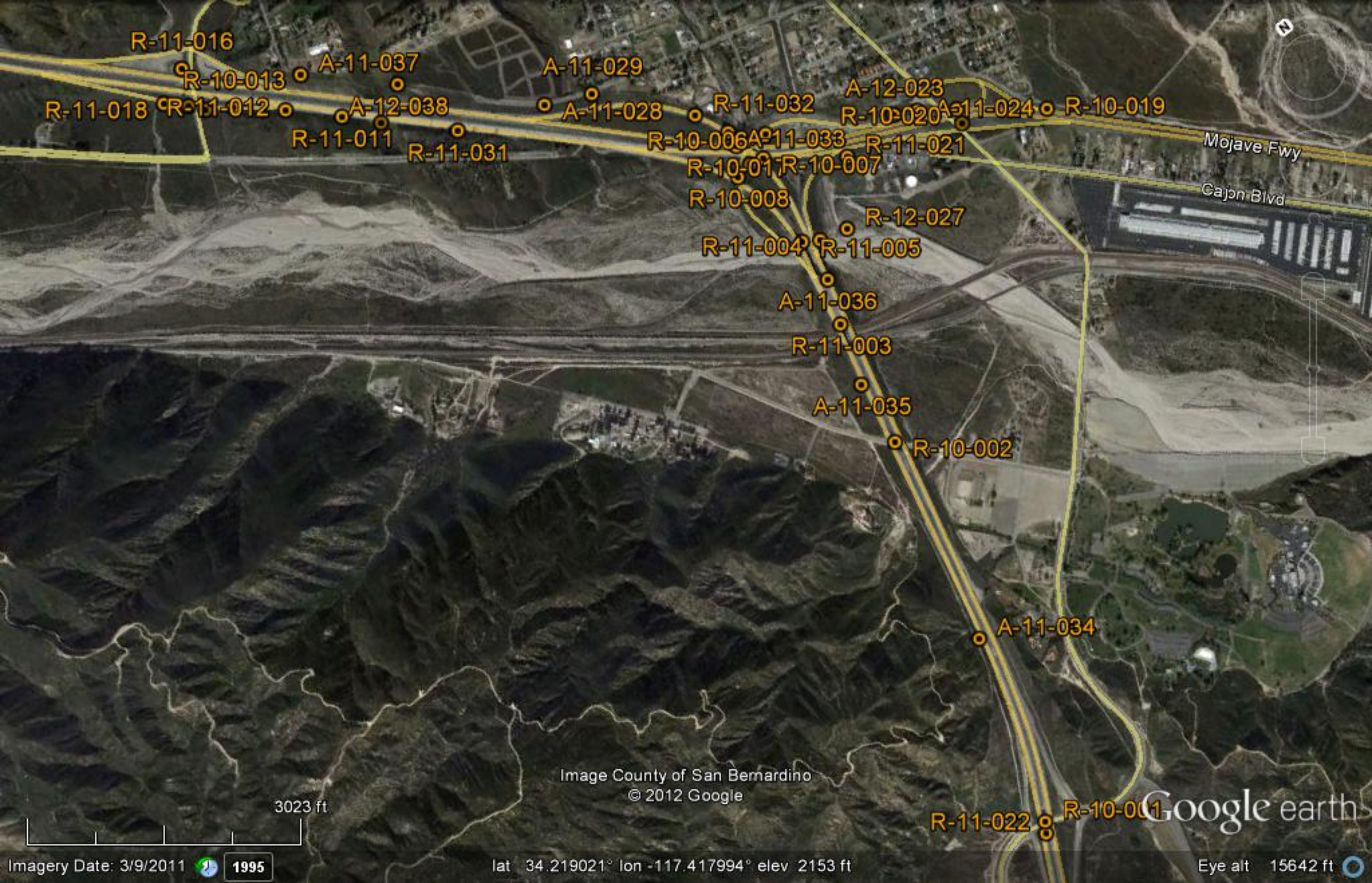
LOG OF TEST BORINGS

SCALE As Noted — BRIDGE 54-793 — PM 16.7 — DRAWING 54783-7

Channel 08203
W.O. 349111

Disregard prints bearing earlier numbers. → PREL. DRAWING No. PR-

BRIDGE DEPARTMENT
ENGINEERING GEOLOGY SECTION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R-10-020
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R-11-021
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R-10-001
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© 2012 Google
3023 ft
Google earth
Imagery Date: 3/9/2011
1995
lat 34.219021° lon -117.417994° elev 2153 ft
Eye alt 15642 ft

EXHIBIT 8-B

Laboratory Test Results

CA Department of Transportation 5900 Folsom Blvd., Sacramento CA 95819 Phone: (916) 227-7204 Fax: (916) 227-7077

4/13/2011

Sample ID No.	Sampled	Received	Approved	Sample of	E.A.	District	TL-101
AG110175	11/30/2010	3/23/2011	EP	SOIL	08-0K7100	08	C709255

Sample From	SMARA#	Location	Depth
GLEN HELEN PKY #54-0779		R-10-001	5.0 to 6.5 ft

Grading Analysis
Test Method CT 202

Aggregate Size	% Passing	Combined	Rubber Size	% Passing
75mm	100		2.36mm	
63mm	100		2.00mm	
50mm	100		1.18mm	
37.5mm	100		600um	
25mm	94		300um	
19mm	91		150um	
12.5mm	87		75um	
9.5mm	85			
4.75mm	79			
2.36mm	86	68		
1.18mm				
600um				
300um				
150um				
75um				
5um				
1um				

Plasticity Index
Test Method CT 204

LL	
PL	
PI	

Sand Equivalent
Test Method CT 217

SE	

Specific Gravity
Test Method CT 206, 207, 208

Retained 4.75mm		Passing 4.75mm	
SSD Sp Gr		SSD Sp Gr	
Apparent		Apparent	
Bulk OD			
% Absorption		% Absorption	

Los Angeles Rattler
Test Method CT 211

Grade		
100 Revs		
500 Revs		

Relative Mortar Strength
Test Method CT 515

Ratio	

Organic Impurities
Test Method CT 213

Quality	
Debris?	

Cleanness Value
Test Method CT 227

63 x 37.5	
37.5 x 19	
25 x 4.75	
12.5 max	
Pit Run	
Combined	

Durability Index
Test Method CT 229

Coarse Durability	
Fine Durability	

Sodium Sulfate Soundness
Test Method CT 214

Type	

Sieve Size	Individual % Loss
63mm x 50mm	
50mm x 37.5mm	
37.5mm x 25mm	
25mm x 19mm	
19mm x 12.5mm	
12.5mm x 9.5mm	
9.5mm x 4.75mm	
Weighted Average Loss of Sample	
Fine Aggregate Loss	

Percent Crushed Particles
Test Method CT 229

Weighted Average	

Note: If corrosion testing was requested, the sample has been processed and sent to Corrosion for CT 417, 422 and 643.

CA Department of Transportation 5900 Folsom Blvd., Sacramento CA 95819 Phone: (916) 227-7204 Fax: (916) 227-7077

4/13/2011

Sample ID No.	Sampled	Received	Approved	Sample of	E.A.	District	TL-101
AG110190	1/11/2011	3/23/2011	EP	SOIL	08-0K7100	08	C709267

Sample From	SMARA#	Location	Depth
NEW DEVORE RD OC		R-11-010	10.0 to 11.5 ft

Grading Analysis
Test Method CT 202

Aggregate Size	% Passing	Combined	Rubber Size	% Passing
75mm	100		2.36mm	
63mm	100		2.00mm	
50mm	100		1.18mm	
37.5mm	100		600um	
25mm	92		300um	
19mm	84		150um	
12.5mm	78		75um	
9.5mm	75			
4.75mm	66			
2.36mm	81	53		
1.18mm				
600um				
300um				
150um				
75um				
5um				
1um				

Plasticity Index
Test Method CT 204

LL	
PL	
PI	

Sand Equivalent
Test Method CT 217

SE	

Specific Gravity
Test Method CT 206, 207, 208

Retained 4.75mm		Passing 4.75mm	
SSD Sp Gr		SSD Sp Gr	
Apparent		Apparent	
Bulk OD			
% Absorption		% Absorption	

Los Angeles Rattler
Test Method CT 211

Grade		
100 Revs		
500 Revs		

Relative Mortar Strength
Test Method CT 515

Ratio	

Organic Impurities
Test Method CT 213

Quality	
Debris?	

Cleanness Value
Test Method CT 227

63 x 37.5	
37.5 x 19	
25 x 4.75	
12.5 max	
Pit Run	
Combined	

Durability Index
Test Method CT 229

Coarse Durability	
Fine Durability	

Sodium Sulfate Soundness
Test Method CT 214

Type

Sieve Size	Individual % Loss
63mm x 50mm	
50mm x 37.5mm	
37.5mm x 25mm	
25mm x 19mm	
19mm x 12.5mm	
12.5mm x 9.5mm	
9.5mm x 4.75mm	
Weighted Average Loss of Sample	
Fine Aggregate Loss	

Percent Crushed Particles
Test Method CT 229

Weighted Average	

Note: If corrosion testing was requested, the sample has been processed and sent to Corrosion for CT 417, 422 and 643.

CA Department of Transportation 5900 Folsom Blvd., Sacramento CA 95819 Phone: (916) 227-7204 Fax: (916) 227-7077

4/13/2011

Sample ID No.	Sampled	Received	Approved	Sample of	E.A.	District	TL-101
AG110191	1/25/2011	3/23/2011	EP	SOIL	08-0K7100	08	C709268

Sample From	SMARA#	Location	Depth
NEW SB215 Connector		R-11-011	5.0 to 6.5 ft

Grading Analysis
Test Method CT 202

Aggregate Size	% Passing	Combined	Rubber Size	% Passing
75mm	100		2.36mm	
63mm	100		2.00mm	
50mm	100		1.18mm	
37.5mm	100		600um	
25mm	100		300um	
19mm	100		150um	
12.5mm	99		75um	
9.5mm	96			
4.75mm	88			
2.36mm	87	77		
1.18mm				
600um				
300um				
150um				
75um				
5um				
1um				

Plasticity Index
Test Method CT 204

LL
PL
PI

Sand Equivalent
Test Method CT 217

SE

Specific Gravity
Test Method CT 206, 207, 208

Retained 4.75mm		Passing 4.75mm	
SSD Sp Gr		SSD Sp Gr	
Apparent		Apparent	
Bulk OD			
% Absorption		% Absorption	

Los Angeles Rattler
Test Method CT 211

Grade
100 Revs
500 Revs

Relative Mortar Strength
Test Method CT 515

Ratio

Organic Impurities
Test Method CT 213

Quality
Debris?

Cleanness Value
Test Method CT 227

63 x 37.5	
37.5 x 19	
25 x 4.75	
12.5 max	
Pit Run	
Combined	

Durability Index
Test Method CT 229

Coarse Durability
Fine Durability

Sodium Sulfate Soundness
Test Method CT 214

Type

Sieve Size	Individual % Loss
63mm x 50mm	
50mm x 37.5mm	
37.5mm x 25mm	
25mm x 19mm	
19mm x 12.5mm	
12.5mm x 9.5mm	
9.5mm x 4.75mm	
Weighted Average Loss of Sample	
Fine Aggregate Loss	

Percent Crushed Particles
Test Method CT 229

Weighted Average

Note: If corrosion testing was requested, the sample has been processed and sent to Corrosion for CT 417, 422 and 643.

CA Department of Transportation 5900 Folsom Blvd., Sacramento CA 95819 Phone: (916) 227-7204 Fax: (916) 227-7077

4/13/2011

Sample ID No.	Sampled	Received	Approved	Sample of	E.A.	District	TL-101
AG110192	1/4/2011	3/23/2011	EP	SOIL	08-0K7100	08	C709269

Sample From	SMARA#	Location	Depth
NEW SB215 Mainline		R-11-012	5. to 6.5

Grading Analysis
Test Method CT 202

Aggregate Size	% Passing	Combined	Rubber Size	% Passing
75mm	100		2.36mm	
63mm	100		2.00mm	
50mm	100		1.18mm	
37.5mm	100		600um	
25mm	95		300um	
19mm	89		150um	
12.5mm	85		75um	
9.5mm	81			
4.75mm	73			
2.36mm	88	64		
1.18mm				
600um				
300um				
150um				
75um				
5um				
1um				

Plasticity Index
Test Method CT 204

LL	
PL	
PI	

Sand Equivalent
Test Method CT 217

SE	

Specific Gravity
Test Method CT 206, 207, 208

Retained 4.75mm		Passing 4.75mm	
SSD Sp Gr		SSD Sp Gr	
Apparent		Apparent	
Bulk OD			
% Absorption		% Absorption	

Los Angeles Rattler
Test Method CT 211

Grade		
100 Revs		
500 Revs		

Relative Mortar Strength
Test Method CT 515

Ratio	

Organic Impurities
Test Method CT 213

Quality	
Debris?	

Cleanness Value
Test Method CT 227

63 x 37.5	
37.5 x 19	
25 x 4.75	
12.5 max	
Pit Run	
Combined	

Durability Index
Test Method CT 229

Coarse Durability	
Fine Durability	

Sodium Sulfate Soundness
Test Method CT 214

Type	

Sieve Size	Individual % Loss
63mm x 50mm	
50mm x 37.5mm	
37.5mm x 25mm	
25mm x 19mm	
19mm x 12.5mm	
12.5mm x 9.5mm	
9.5mm x 4.75mm	
Weighted Average Loss of Sample	
Fine Aggregate Loss	

Percent Crushed Particles
Test Method CT 229

Weighted Average	

Note: If corrosion testing was requested, the sample has been processed and sent to Corrosion for CT 417, 422 and 643.

CA Department of Transportation 5900 Folsom Blvd., Sacramento CA 95819 Phone: (916) 227-7204 Fax: (916) 227-7077

4/13/2011

Sample ID No.	Sampled	Received	Approved	Sample of	E.A.	District	TL-101
AG110193	12/15/2010	3/23/2011	EP	SOIL	08-0K7100	08	C709270

Sample From	SMARA#	Location	Depth
NEW SB215 Mainline		R-10-013, SB15 PM R 14.96	15.0 to 16.5 ft

Grading Analysis
Test Method CT 202

Aggregate Size	% Passing	Combined	Rubber Size	% Passing
75mm	100		2.36mm	
63mm	100		2.00mm	
50mm	100		1.18mm	
37.5mm	100		600um	
25mm	100		300um	
19mm	100		150um	
12.5mm	99		75um	
9.5mm	99			
4.75mm	94			
2.36mm	90	85		
1.18mm				
600um				
300um				
150um				
75um				
5um				
1um				

Plasticity Index
Test Method CT 204

LL	
PL	
PI	

Sand Equivalent
Test Method CT 217

SE	

Specific Gravity
Test Method CT 206, 207, 208

Retained 4.75mm		Passing 4.75mm	
SSD Sp Gr		SSD Sp Gr	
Apparent		Apparent	
Bulk OD			
% Absorption		% Absorption	

Los Angeles Rattler
Test Method CT 211

Grade		
100 Revs		
500 Revs		

Relative Mortar Strength
Test Method CT 515

Ratio	

Organic Impurities
Test Method CT 213

Quality	
Debris?	

Cleanness Value
Test Method CT 227

63 x 37.5	
37.5 x 19	
25 x 4.75	
12.5 max	
Pit Run	
Combined	

Durability Index
Test Method CT 229

Coarse Durability	
Fine Durability	

Sodium Sulfate Soundness
Test Method CT 214

Type

Sieve Size	Individual % Loss
63mm x 50mm	
50mm x 37.5mm	
37.5mm x 25mm	
25mm x 19mm	
19mm x 12.5mm	
12.5mm x 9.5mm	
9.5mm x 4.75mm	
Weighted Average Loss of Sample	
Fine Aggregate Loss	

Percent Crushed Particles
Test Method CT 229

Weighted Average	

Note: If corrosion testing was requested, the sample has been processed and sent to Corrosion for CT 417, 422 and 643.

CA Department of Transportation 5900 Folsom Blvd., Sacramento CA 95819 Phone: (916) 227-7204 Fax: (916) 227-7077

4/13/2011

Sample ID No.	Sampled	Received	Approved	Sample of	E.A.	District	TL-101
AG110194	2/1/2011	3/23/2011	EP	SOIL	08-0K7100	08	C709271

Sample From	SMARA#	Location	Depth
NEW SB215 Mainlin		R-11-014, SB15 PM15.00	10.0 to 11.5 ft

Grading Analysis
Test Method CT 202

Aggregate Size	% Passing	Combined	Rubber Size	% Passing
75mm	100		2.36mm	
63mm	100		2.00mm	
50mm	100		1.18mm	
37.5mm	100		600um	
25mm	92		300um	
19mm	83		150um	
12.5mm	75		75um	
9.5mm	72			
4.75mm	65			
2.36mm	88	57		
1.18mm				
600um				
300um				
150um				
75um				
5um				
1um				

Plasticity Index
Test Method CT 204

LL	
PL	
PI	

Sand Equivalent
Test Method CT 217

SE	

Specific Gravity
Test Method CT 206, 207, 208

Retained 4.75mm		Passing 4.75mm	
SSD Sp Gr		SSD Sp Gr	
Apparent		Apparent	
Bulk OD			
% Absorption		% Absorption	

Los Angeles Rattler
Test Method CT 211

Grade		
100 Revs		
500 Revs		

Relative Mortar Strength
Test Method CT 515

Ratio	

Organic Impurities
Test Method CT 213

Quality	
Debris?	

Cleanness Value
Test Method CT 227

63 x 37.5	
37.5 x 19	
25 x 4.75	
12.5 max	
Pit Run	
Combined	

Durability Index
Test Method CT 229

Coarse Durability	
Fine Durability	

Sodium Sulfate Soundness
Test Method CT 214

Type	

Sieve Size	Individual % Loss
63mm x 50mm	
50mm x 37.5mm	
37.5mm x 25mm	
25mm x 19mm	
19mm x 12.5mm	
12.5mm x 9.5mm	
9.5mm x 4.75mm	
Weighted Average Loss of Sample	
Fine Aggregate Loss	

Percent Crushed Particles
Test Method CT 229

Weighted Average	

Note: If corrosion testing was requested, the sample has been processed and sent to Corrosion for CT 417, 422 and 643.

CA Department of Transportation 5900 Folsom Blvd., Sacramento CA 95819 Phone: (916) 227-7204 Fax: (916) 227-7077

4/13/2011

Sample ID No.	Sampled	Received	Approved	Sample of	E.A.	District	TL-101
AG110195	12/15/2010	3/23/2011	EP	SOIL	08-0K7100	08	C709272

Sample From	SMARA#	Location	Depth
NEW SB15 Truck By-Pass		R-10-015, SB15 PM R14.96	15.0 to 16.5

Grading Analysis
Test Method CT 202

Aggregate Size	% Passing	Combined	Rubber Size	% Passing
75mm	100		2.36mm	
63mm	100		2.00mm	
50mm	100		1.18mm	
37.5mm	100		600um	
25mm	100		300um	
19mm	96		150um	
12.5mm	87		75um	
9.5mm	84			
4.75mm	74			
2.36mm	85	63		
1.18mm				
600um				
300um				
150um				
75um				
5um				
1um				

Plasticity Index
Test Method CT 204

LL
PL
PI

Sand Equivalent
Test Method CT 217

SE

Specific Gravity
Test Method CT 206, 207, 208

Retained 4.75mm		Passing 4.75mm	
SSD Sp Gr		SSD Sp Gr	
Apparent		Apparent	
Bulk OD			
% Absorption		% Absorption	

Los Angeles Rattler
Test Method CT 211

Grade
100 Revs
500 Revs

Relative Mortar Strength
Test Method CT 515

Ratio

Organic Impurities
Test Method CT 213

Quality
Debris?

Cleanness Value
Test Method CT 227

63 x 37.5	
37.5 x 19	
25 x 4.75	
12.5 max	
Pit Run	
Combined	

Durability Index
Test Method CT 229

Coarse Durability
Fine Durability

Sodium Sulfate Soundness
Test Method CT 214

Type

Sieve Size	Individual % Loss
63mm x 50mm	
50mm x 37.5mm	
37.5mm x 25mm	
25mm x 19mm	
19mm x 12.5mm	
12.5mm x 9.5mm	
9.5mm x 4.75mm	
Weighted Average Loss of Sample	
Fine Aggregate Loss	

Percent Crushed Particles
Test Method CT 229

Weighted Average

Note: If corrosion testing was requested, the sample has been processed and sent to Corrosion for CT 417, 422 and 643.

CA Department of Transportation 5900 Folsom Blvd., Sacramento CA 95819 Phone: (916) 227-7204 Fax: (916) 227-7077

4/13/2011

Sample ID No.	Sampled	Received	Approved	Sample of	E.A.	District	TL-101
AG110197	2/9/2011	3/23/2011	EP	SOIL	08-0K7100	08	C709274

Sample From	SMARA#	Location	Depth
NEW NB15 Truck By-Pass		R-11-016 NB15 PM15.00	25.0 to 26.5 ft

Grading Analysis
Test Method CT 202

Aggregate Size	% Passing	Combined	Rubber Size	% Passing
75mm	100		2.36mm	
63mm	100		2.00mm	
50mm	100		1.18mm	
37.5mm	100		600um	
25mm	100		300um	
19mm	95		150um	
12.5mm	86		75um	
9.5mm	82			
4.75mm	71			
2.36mm	86	61		
1.18mm				
600um				
300um				
150um				
75um				
5um				
1um				

Plasticity Index
Test Method CT 204

LL	
PL	
PI	

Sand Equivalent
Test Method CT 217

SE	

Specific Gravity
Test Method CT 206, 207, 208

Retained 4.75mm		Passing 4.75mm	
SSD Sp Gr		SSD Sp Gr	
Apparent		Apparent	
Bulk OD			
% Absorption		% Absorption	

Los Angeles Rattler
Test Method CT 211

Grade		
100 Revs		
500 Revs		

Relative Mortar Strength
Test Method CT 515

Ratio	

Organic Impurities
Test Method CT 213

Quality	
Debris?	

Cleanness Value
Test Method CT 227

63 x 37.5	
37.5 x 19	
25 x 4.75	
12.5 max	
Pit Run	
Combined	

Durability Index
Test Method CT 229

Coarse Durability	
Fine Durability	

Sodium Sulfate Soundness
Test Method CT 214

Type

Sieve Size	Individual % Loss
63mm x 50mm	
50mm x 37.5mm	
37.5mm x 25mm	
25mm x 19mm	
19mm x 12.5mm	
12.5mm x 9.5mm	
9.5mm x 4.75mm	
Weighted Average Loss of Sample	
Fine Aggregate Loss	

Percent Crushed Particles
Test Method CT 229

Weighted Average	

Note: If corrosion testing was requested, the sample has been processed and sent to Corrosion for CT 417, 422 and 643.

CA Department of Transportation 5900 Folsom Blvd., Sacramento CA 95819 Phone: (916) 227-7204 Fax: (916) 227-7077

4/13/2011

Sample ID No.	Sampled	Received	Approved	Sample of	E.A.	District	TL-101
AG110196	2/8/2011	3/23/2011	EP	SOIL	08-0K7100	08	C709273

Sample From	SMARA#	Location	Depth
NEW NB15 Truck By-Pass		R-11-016 NB 15 PM 15.00	5.0 to 6.5 ft

Grading Analysis
Test Method CT 202

Aggregate Size	% Passing	Combined	Rubber Size	% Passing
75mm	100		2.36mm	
63mm	100		2.00mm	
50mm	100		1.18mm	
37.5mm	100		600um	
25mm	100		300um	
19mm	94		150um	
12.5mm	91		75um	
9.5mm	89			
4.75mm	83			
2.36mm	91	76		
1.18mm				
600um				
300um				
150um				
75um				
5um				
1um				

Plasticity Index
Test Method CT 204

LL	
PL	
PI	

Sand Equivalent
Test Method CT 217

SE	

Specific Gravity
Test Method CT 206, 207, 208

Retained 4.75mm		Passing 4.75mm	
SSD Sp Gr		SSD Sp Gr	
Apparent		Apparent	
Bulk OD			
% Absorption		% Absorption	

Los Angeles Rattler
Test Method CT 211

Grade		
100 Revs		
500 Revs		

Relative Mortar Strength
Test Method CT 515

Ratio	

Organic Impurities
Test Method CT 213

Quality	
Debris?	

Cleanness Value
Test Method CT 227

63 x 37.5	
37.5 x 19	
25 x 4.75	
12.5 max	
Pit Run	
Combined	

Durability Index
Test Method CT 229

Coarse Durability	
Fine Durability	

Sodium Sulfate Soundness
Test Method CT 214

Type

Sieve Size	Individual % Loss
63mm x 50mm	
50mm x 37.5mm	
37.5mm x 25mm	
25mm x 19mm	
19mm x 12.5mm	
12.5mm x 9.5mm	
9.5mm x 4.75mm	
Weighted Average Loss of Sample	
Fine Aggregate Loss	

Percent Crushed Particles
Test Method CT 229

Weighted Average	

Note: If corrosion testing was requested, the sample has been processed and sent to Corrosion for CT 417, 422 and 643.

CA Department of Transportation 5900 Folsom Blvd., Sacramento CA 95819 Phone: (916) 227-7204 Fax: (916) 227-7077

4/13/2011

Sample ID No.	Sampled	Received	Approved	Sample of	E.A.	District	TL-101
AG110188	12/8/2010	3/23/2011	EP	SOIL	08-0K7100	08	C709265

Sample From	SMARA#	Location	Depth
15/215 SEP #54-0783R		R-10-017	10.0 to 11.5 ft

Grading Analysis
Test Method CT 202

Aggregate Size	% Passing	Combined	Rubber Size	% Passing
75mm	100		2.36mm	
63mm	100		2.00mm	
50mm	100		1.18mm	
37.5mm	100		600um	
25mm	100		300um	
19mm	95		150um	
12.5mm	95		75um	
9.5mm	95			
4.75mm	89			
2.36mm	89	79		
1.18mm				
600um				
300um				
150um				
75um				
5um				
1um				

Plasticity Index
Test Method CT 204

LL	
PL	
PI	

Sand Equivalent
Test Method CT 217

SE	

Specific Gravity
Test Method CT 206, 207, 208

Retained 4.75mm		Passing 4.75mm	
SSD Sp Gr		SSD Sp Gr	
Apparent		Apparent	
Bulk OD			
% Absorption		% Absorption	

Los Angeles Rattler
Test Method CT 211

Grade		
100 Revs		
500 Revs		

Relative Mortar Strength
Test Method CT 515

Ratio	

Organic Impurities
Test Method CT 213

Quality	
Debris?	

Cleanness Value
Test Method CT 227

63 x 37.5	
37.5 x 19	
25 x 4.75	
12.5 max	
Pit Run	
Combined	

Durability Index
Test Method CT 229

Coarse Durability	
Fine Durability	

Sodium Sulfate Soundness
Test Method CT 214

Type

Sieve Size	Individual % Loss
63mm x 50mm	
50mm x 37.5mm	
37.5mm x 25mm	
25mm x 19mm	
19mm x 12.5mm	
12.5mm x 9.5mm	
9.5mm x 4.75mm	
Weighted Average Loss of Sample	
Fine Aggregate Loss	

Percent Crushed Particles
Test Method CT 229

Weighted Average	

Note: If corrosion testing was requested, the sample has been processed and sent to Corrosion for CT 417, 422 and 643.

CA Department of Transportation 5900 Folsom Blvd., Sacramento CA 95819 Phone: (916) 227-7204 Fax: (916) 227-7077

4/13/2011

Sample ID No.	Sampled	Received	Approved	Sample of	E.A.	District	TL-101
AG110198	12/14/2010	3/23/2011	EP	SOIL	08-0K7100	08	C709275

Sample From	SMARA#	Location	Depth
New SIGN		R-10-019 NB215 PM17.1	5.0 - 6.5 Ft

Grading Analysis
Test Method CT 202

Aggregate Size	% Passing	Combined	Rubber Size	% Passing
75mm	100		2.36mm	
63mm	100		2.00mm	
50mm	100		1.18mm	
37.5mm	100		600um	
25mm	74		300um	
19mm	67		150um	
12.5mm	61		75um	
9.5mm	59			
4.75mm	51			
2.36mm	88	45		
1.18mm				
600um				
300um				
150um				
75um				
5um				
1um				

Plasticity Index
Test Method CT 204

LL	
PL	
PI	

Sand Equivalent
Test Method CT 217

SE	

Specific Gravity
Test Method CT 206, 207, 208

Retained 4.75mm		Passing 4.75mm	
SSD Sp Gr		SSD Sp Gr	
Apparent		Apparent	
Bulk OD			
% Absorption		% Absorption	

Los Angeles Rattler
Test Method CT 211

Grade		
100 Revs		
500 Revs		

Relative Mortar Strength
Test Method CT 515

Ratio	

Organic Impurities
Test Method CT 213

Quality	
Debris?	

Cleanness Value
Test Method CT 227

63 x 37.5	
37.5 x 19	
25 x 4.75	
12.5 max	
Pit Run	
Combined	

Durability Index
Test Method CT 229

Coarse Durability	
Fine Durability	

Sodium Sulfate Soundness
Test Method CT 214

Type

Sieve Size	Individual % Loss
63mm x 50mm	
50mm x 37.5mm	
37.5mm x 25mm	
25mm x 19mm	
19mm x 12.5mm	
12.5mm x 9.5mm	
9.5mm x 4.75mm	
Weighted Average Loss of Sample	
Fine Aggregate Loss	

Percent Crushed Particles
Test Method CT 229

Weighted Average	

Note: If corrosion testing was requested, the sample has been processed and sent to Corrosion for CT 417, 422 and 643.

CA Department of Transportation 5900 Folsom Blvd., Sacramento CA 95819 Phone: (916) 227-7204 Fax: (916) 227-7077

4/13/2011

Sample ID No.	Sampled	Received	Approved	Sample of	E.A.	District	TL-101
AG110176	1/11/2011	3/23/2011	EP	SOIL	08-0K7100	08	C709257

Sample From	SMARA#	Location	Depth
DEVORE OH 54-0818		R-11-003	10.0 to 11.5 ft

Grading Analysis
Test Method CT 202

Aggregate Size	% Passing	Combined	Rubber Size	% Passing
75mm	100		2.36mm	
63mm	100		2.00mm	
50mm	100		1.18mm	
37.5mm	100		600um	
25mm	100		300um	
19mm	100		150um	
12.5mm	100		75um	
9.5mm	99			
4.75mm	90			
2.36mm	79	71		
1.18mm				
600um				
300um				
150um				
75um				
5um				
1um				

Plasticity Index
Test Method CT 204

LL	
PL	
PI	

Sand Equivalent
Test Method CT 217

SE	

Specific Gravity
Test Method CT 206, 207, 208

Retained 4.75mm		Passing 4.75mm	
SSD Sp Gr		SSD Sp Gr	
Apparent		Apparent	
Bulk OD			
% Absorption		% Absorption	

Los Angeles Rattler
Test Method CT 211

Grade		
100 Revs		
500 Revs		

Relative Mortar Strength
Test Method CT 515

Ratio	

Organic Impurities
Test Method CT 213

Quality	
Debris?	

Cleanness Value
Test Method CT 227

63 x 37.5	
37.5 x 19	
25 x 4.75	
12.5 max	
Pit Run	
Combined	

Durability Index
Test Method CT 229

Coarse Durability	
Fine Durability	

Sodium Sulfate Soundness
Test Method CT 214

Type

Sieve Size	Individual % Loss
63mm x 50mm	
50mm x 37.5mm	
37.5mm x 25mm	
25mm x 19mm	
19mm x 12.5mm	
12.5mm x 9.5mm	
9.5mm x 4.75mm	
Weighted Average Loss of Sample	
Fine Aggregate Loss	

Percent Crushed Particles
Test Method CT 229

Weighted Average	

Note: If corrosion testing was requested, the sample has been processed and sent to Corrosion for CT 417, 422 and 643.

CA Department of Transportation 5900 Folsom Blvd., Sacramento CA 95819 Phone: (916) 227-7204 Fax: (916) 227-7077

4/13/2011

Sample ID No.	Sampled	Received	Approved	Sample of	E.A.	District	TL-101
AG110177	1/11/2011	3/23/2011	EP	SOIL	08-0K7100	08	C709258

Sample From	SMARA#	Location	Depth
DEVORE OH #54-0818		R-11-003	65.0 to 66.5 ft

Grading Analysis
Test Method CT 202

Size	Aggregate % Passing	Aggregate Combined	Rubber Size	Rubber % Passing
75mm	100		2.36mm	
63mm	100		2.00mm	
50mm	100		1.18mm	
37.5mm	100		600um	
25mm	100		300um	
19mm	100		150um	
12.5mm	99		75um	
9.5mm	95			
4.75mm	85			
2.36mm	81	69		
1.18mm				
600um				
300um				
150um				
75um				
5um				
1um				

Plasticity Index
Test Method CT 204

LL	
PL	
PI	

Sand Equivalent
Test Method CT 217

SE	

Specific Gravity
Test Method CT 206, 207, 208

Retained 4.75mm		Passing 4.75mm	
SSD Sp Gr		SSD Sp Gr	
Apparent		Apparent	
Bulk OD			
% Absorption		% Absorption	

Los Angeles Rattler
Test Method CT 211

Grade		
100 Revs		
500 Revs		

Relative Mortar Strength
Test Method CT 515

Ratio	

Organic Impurities
Test Method CT 213

Quality	
Debris?	

Cleanness Value
Test Method CT 227

63 x 37.5		
37.5 x 19		
25 x 4.75		
12.5 max		
Pit Run		
Combined		

Durability Index
Test Method CT 229

Coarse Durability	
Fine Durability	

Sodium Sulfate Soundness
Test Method CT 214

Type	

Sieve Size	Individual % Loss
63mm x 50mm	
50mm x 37.5mm	
37.5mm x 25mm	
25mm x 19mm	
19mm x 12.5mm	
12.5mm x 9.5mm	
9.5mm x 4.75mm	
Weighted Average Loss of Sample	
Fine Aggregate Loss	

Percent Crushed Particles
Test Method CT 229

Weighted Average	

Note: If corrosion testing was requested, the sample has been processed and sent to Corrosion for CT 417, 422 and 643.

CA Department of Transportation 5900 Folsom Blvd., Sacramento CA 95819 Phone: (916) 227-7204 Fax: (916) 227-7077

4/13/2011

Sample ID No.	Sampled	Received	Approved	Sample of	E.A.	District	TL-101
AG110178	1/19/2011	3/23/2011	EP	SOIL	08-0K7100	08	C709260

Sample From	SMARA#	Location	Depth
CAJON CK #54-0781R		R-11-004	80.0 to 81.5 ft

Grading Analysis
Test Method CT 202

Aggregate Size	% Passing	Combined	Rubber Size	% Passing
75mm	100		2.36mm	
63mm	100		2.00mm	
50mm	100		1.18mm	
37.5mm	100		600um	
25mm	100		300um	
19mm	95		150um	
12.5mm	81		75um	
9.5mm	77			
4.75mm	68			
2.36mm	89	61		
1.18mm				
600um				
300um				
150um				
75um				
5um				
1um				

Plasticity Index
Test Method CT 204

LL	
PL	
PI	

Sand Equivalent
Test Method CT 217

SE	

Specific Gravity
Test Method CT 206, 207, 208

Retained 4.75mm		Passing 4.75mm	
SSD Sp Gr		SSD Sp Gr	
Apparent		Apparent	
Bulk OD			
% Absorption		% Absorption	

Los Angeles Rattler
Test Method CT 211

Grade		
100 Revs		
500 Revs		

Relative Mortar Strength
Test Method CT 515

Ratio	

Organic Impurities
Test Method CT 213

Quality	
Debris?	

Cleanness Value
Test Method CT 227

63 x 37.5		
37.5 x 19		
25 x 4.75		
12.5 max		
Pit Run		
Combined		

Durability Index
Test Method CT 229

Coarse Durability	
Fine Durability	

Sodium Sulfate Soundness
Test Method CT 214

Type	

Sieve Size	Individual % Loss
63mm x 50mm	
50mm x 37.5mm	
37.5mm x 25mm	
25mm x 19mm	
19mm x 12.5mm	
12.5mm x 9.5mm	
9.5mm x 4.75mm	
Weighted Average Loss of Sample	
Fine Aggregate Loss	

Percent Crushed Particles
Test Method CT 229

Weighted Average	

Note: If corrosion testing was requested, the sample has been processed and sent to Corrosion for CT 417, 422 and 643.

CA Department of Transportation 5900 Folsom Blvd., Sacramento CA 95819 Phone: (916) 227-7204 Fax: (916) 227-7077

4/13/2011

Sample ID No.	Sampled	Received	Approved	Sample of	E.A.	District	TL-101
AG110179	1/19/2011	3/23/2011	EP	SOIL	08-0K7100	08	C709261

Sample From	SMARA#	Location	Depth
CAJON CK #54-0781L		R-11-005	20.0 to 21.5 ft

Grading Analysis
Test Method CT 202

Aggregate Size	% Passing	Combined	Rubber Size	% Passing
75mm	100		2.36mm	
63mm	100		2.00mm	
50mm	100		1.18mm	
37.5mm	100		600um	
25mm	96		300um	
19mm	92		150um	
12.5mm	84		75um	
9.5mm	79			
4.75mm	71			
2.36mm	85	60		
1.18mm				
600um				
300um				
150um				
75um				
5um				
1um				

Plasticity Index
Test Method CT 204

LL	
PL	
PI	

Sand Equivalent
Test Method CT 217

SE	

Specific Gravity
Test Method CT 206, 207, 208

Retained 4.75mm		Passing 4.75mm	
SSD Sp Gr		SSD Sp Gr	
Apparent		Apparent	
Bulk OD			
% Absorption		% Absorption	

Los Angeles Rattler
Test Method CT 211

Grade		
100 Revs		
500 Revs		

Relative Mortar Strength
Test Method CT 515

Ratio	

Organic Impurities
Test Method CT 213

Quality	
Debris?	

Cleanness Value
Test Method CT 227

63 x 37.5	
37.5 x 19	
25 x 4.75	
12.5 max	
Pit Run	
Combined	

Durability Index
Test Method CT 229

Coarse Durability	
Fine Durability	

Sodium Sulfate Soundness
Test Method CT 214

Type	

Sieve Size	Individual % Loss
63mm x 50mm	
50mm x 37.5mm	
37.5mm x 25mm	
25mm x 19mm	
19mm x 12.5mm	
12.5mm x 9.5mm	
9.5mm x 4.75mm	
Weighted Average Loss of Sample	
Fine Aggregate Loss	

Percent Crushed Particles
Test Method CT 229

Weighted Average	

Note: If corrosion testing was requested, the sample has been processed and sent to Corrosion for CT 417, 422 and 643.

CA Department of Transportation 5900 Folsom Blvd., Sacramento CA 95819 Phone: (916) 227-7204 Fax: (916) 227-7077

4/13/2011

Sample ID No.	Sampled	Received	Approved	Sample of	E.A.	District	TL-101
AG110180	1/19/2011	3/23/2011	EP	SOIL	08-0K7100	08	C709262

Sample From	SMARA#	Location	Depth
CAJON CK #54-0781L		R-11-005	75.0 to 80.5 ft

Grading Analysis
Test Method CT 202

Aggregate Size	% Passing	Combined	Rubber Size	% Passing
75mm	100		2.36mm	
63mm	100		2.00mm	
50mm	100		1.18mm	
37.5mm	100		600um	
25mm	78		300um	
19mm	62		150um	
12.5mm	57		75um	
9.5mm	55			
4.75mm	46			
2.36mm	86	40		
1.18mm				
600um				
300um				
150um				
75um				
5um				
1um				

Plasticity Index
Test Method CT 204

LL	
PL	
PI	

Sand Equivalent
Test Method CT 217

SE	

Specific Gravity
Test Method CT 206, 207, 208

Retained 4.75mm		Passing 4.75mm	
SSD Sp Gr		SSD Sp Gr	
Apparent		Apparent	
Bulk OD			
% Absorption		% Absorption	

Los Angeles Rattler
Test Method CT 211

Grade		
100 Revs		
500 Revs		

Relative Mortar Strength
Test Method CT 515

Ratio	

Organic Impurities
Test Method CT 213

Quality	
Debris?	

Cleanness Value
Test Method CT 227

63 x 37.5	
37.5 x 19	
25 x 4.75	
12.5 max	
Pit Run	
Combined	

Durability Index
Test Method CT 229

Coarse Durability	
Fine Durability	

Sodium Sulfate Soundness
Test Method CT 214

Type

Sieve Size	Individual % Loss
63mm x 50mm	
50mm x 37.5mm	
37.5mm x 25mm	
25mm x 19mm	
19mm x 12.5mm	
12.5mm x 9.5mm	
9.5mm x 4.75mm	
Weighted Average Loss of Sample	
Fine Aggregate Loss	

Percent Crushed Particles
Test Method CT 229

Weighted Average	

Note: If corrosion testing was requested, the sample has been processed and sent to Corrosion for CT 417, 422 and 643.

CA Department of Transportation 5900 Folsom Blvd., Sacramento CA 95819 Phone: (916) 227-7204 Fax: (916) 227-7077

4/13/2011

Sample ID No.	Sampled	Received	Approved	Sample of	E.A.	District	TL-101
AG110186	12/7/2010	3/23/2011	EP	SOIL	08-0K7100	08	C709263

Sample From	SMARA#	Location	Depth
W.S. CONNECTOR		R-10-006	10.0 to 11.5 ft

Grading Analysis
Test Method CT 202

Aggregate Size	% Passing	Combined	Rubber Size	% Passing
75mm	100		2.36mm	
63mm	100		2.00mm	
50mm	100		1.18mm	
37.5mm	100		600um	
25mm	91		300um	
19mm	89		150um	
12.5mm	78		75um	
9.5mm	73			
4.75mm	60			
2.36mm	82	49		
1.18mm				
600um				
300um				
150um				
75um				
5um				
1um				

Plasticity Index
Test Method CT 204

LL	
PL	
PI	

Sand Equivalent
Test Method CT 217

SE	

Specific Gravity
Test Method CT 206, 207, 208

Retained 4.75mm		Passing 4.75mm	
SSD Sp Gr		SSD Sp Gr	
Apparent		Apparent	
Bulk OD			
% Absorption		% Absorption	

Los Angeles Rattler
Test Method CT 211

Grade		
100 Revs		
500 Revs		

Relative Mortar Strength
Test Method CT 515

Ratio	

Organic Impurities
Test Method CT 213

Quality	
Debris?	

Cleanness Value
Test Method CT 227

63 x 37.5	
37.5 x 19	
25 x 4.75	
12.5 max	
Pit Run	
Combined	

Durability Index
Test Method CT 229

Coarse Durability	
Fine Durability	

Sodium Sulfate Soundness
Test Method CT 214

Type	

Sieve Size	Individual % Loss
63mm x 50mm	
50mm x 37.5mm	
37.5mm x 25mm	
25mm x 19mm	
19mm x 12.5mm	
12.5mm x 9.5mm	
9.5mm x 4.75mm	
Weighted Average Loss of Sample	
Fine Aggregate Loss	

Percent Crushed Particles
Test Method CT 229

Weighted Average	

Note: If corrosion testing was requested, the sample has been processed and sent to Corrosion for CT 417, 422 and 643.

CA Department of Transportation 5900 Folsom Blvd., Sacramento CA 95819 Phone: (916) 227-7204 Fax: (916) 227-7077

4/13/2011

Sample ID No.	Sampled	Received	Approved	Sample of	E.A.	District	TL-101
AG110187	12/8/2010	3/23/2011	EP	SOIL	08-0K7100	08	C709264

Sample From	SMARA#	Location	Depth
15/215 SEP #54-0783R		R-10-007	5.0 to 6.5 ft

Grading Analysis
Test Method CT 202

Aggregate Size	% Passing	Combined	Rubber Size	% Passing
75mm	100		2.36mm	
63mm	100		2.00mm	
50mm	100		1.18mm	
37.5mm	100		600um	
25mm	100		300um	
19mm	90		150um	
12.5mm	85		75um	
9.5mm	81			
4.75mm	71			
2.36mm	84	60		
1.18mm				
600um				
300um				
150um				
75um				
5um				
1um				

Plasticity Index
Test Method CT 204

LL	
PL	
PI	

Sand Equivalent
Test Method CT 217

SE	

Specific Gravity
Test Method CT 206, 207, 208

Retained 4.75mm		Passing 4.75mm	
SSD Sp Gr		SSD Sp Gr	
Apparent		Apparent	
Bulk OD			
% Absorption		% Absorption	

Los Angeles Rattler
Test Method CT 211

Grade		
100 Revs		
500 Revs		

Relative Mortar Strength
Test Method CT 515

Ratio	

Organic Impurities
Test Method CT 213

Quality	
Debris?	

Cleanness Value
Test Method CT 227

63 x 37.5	
37.5 x 19	
25 x 4.75	
12.5 max	
Pit Run	
Combined	

Durability Index
Test Method CT 229

Coarse Durability	
Fine Durability	

Sodium Sulfate Soundness
Test Method CT 214

Type

Sieve Size	Individual % Loss
63mm x 50mm	
50mm x 37.5mm	
37.5mm x 25mm	
25mm x 19mm	
19mm x 12.5mm	
12.5mm x 9.5mm	
9.5mm x 4.75mm	
Weighted Average Loss of Sample	
Fine Aggregate Loss	

Percent Crushed Particles
Test Method CT 229

Weighted Average	

Note: If corrosion testing was requested, the sample has been processed and sent to Corrosion for CT 417, 422 and 643.

CA Department of Transportation 5900 Folsom Blvd., Sacramento CA 95819 Phone: (916) 227-7204 Fax: (916) 227-7077

4/13/2011

Sample ID No.	Sampled	Received	Approved	Sample of	E.A.	District	TL-101
AG110189	12/7/2010	3/23/2011	EP	SOIL	08-0K7100	08	C709266

Sample From	SMARA#	Location	Depth
WEST CONN. #54-0782		R-10-008	5.0 to 6.5 ft

Grading Analysis
Test Method CT 202

Aggregate Size	% Passing	Combined	Rubber Size	% Passing
75mm	100		2.36mm	
63mm	100		2.00mm	
50mm	100		1.18mm	
37.5mm	100		600um	
25mm	92		300um	
19mm	90		150um	
12.5mm	90		75um	
9.5mm	90			
4.75mm	86			
2.36mm	71	61		
1.18mm				
600um				
300um				
150um				
75um				
5um				
1um				

Plasticity Index
Test Method CT 204

LL	
PL	
PI	

Sand Equivalent
Test Method CT 217

SE	

Specific Gravity
Test Method CT 206, 207, 208

Retained 4.75mm		Passing 4.75mm	
SSD Sp Gr		SSD Sp Gr	
Apparent		Apparent	
Bulk OD			
% Absorption		% Absorption	

Los Angeles Rattler
Test Method CT 211

Grade		
100 Revs		
500 Revs		

Relative Mortar Strength
Test Method CT 515

Ratio	

Organic Impurities
Test Method CT 213

Quality	
Debris?	

Cleanness Value
Test Method CT 227

63 x 37.5	
37.5 x 19	
25 x 4.75	
12.5 max	
Pit Run	
Combined	

Durability Index
Test Method CT 229

Coarse Durability	
Fine Durability	

Sodium Sulfate Soundness
Test Method CT 214

Type	

Sieve Size	Individual % Loss
63mm x 50mm	
50mm x 37.5mm	
37.5mm x 25mm	
25mm x 19mm	
19mm x 12.5mm	
12.5mm x 9.5mm	
9.5mm x 4.75mm	
Weighted Average Loss of Sample	
Fine Aggregate Loss	

Percent Crushed Particles
Test Method CT 229

Weighted Average	

Note: If corrosion testing was requested, the sample has been processed and sent to Corrosion for CT 417, 422 and 643.

<Rudy_C_Lopez@dot.ca.gov>

05/04/2011 10:11 AM

To <douglas_cook@dot.ca.gov>
cc
bcc
Subject Corrosion Test Summary Report - EA: 08-0K710K, EFIS 0800000366 (Corr. # CR110180)

Division of Engineering Services
Materials Engineering and Testing Services
Corrosion And Structural Concrete Field Investigation Branch
Report Date: 5/4/2011
Reported By: Lopez, Rudy

TEST SUMMARY REPORT - Soil/Water

Bridge Name: **GLEN HELEN PARKWAY**
Bridge Number: **54-0779**
EA No.: **08-0K710K**
EFIS No.: **0800000366**
Dist/Co/Rte/PM or KP: **08 / SBD / 15 / 14.77**

SIC Number (TL101)	Sample Location	Sample Type	Sample Depth	Minimum Resistivity[1] (ohm-cm)	pH[2]	Chloride Content[3] (ppm)	Sulfate Content[4] (ppm)
C709255		SOIL	5.0 FT TO 6.5 FT/R-10-001	14885	8.61		

This site is not corrosive to foundation elements (see note below for MSE wall backfill).

Note: For MSE wall structure backfill material, minimum resisitivity must be 2000 ohm-cm or greater,
pH must be between 5.5 and 10.0, chloride content must not be greater than 250 ppm, and sulfate content must not be greater than 500 ppm.

[1,2]CTM 643, [3]CTM 422, [4]CTM 417

<Rudy_C_Lopez@dot.ca.gov>

05/04/2011 10:20 AM

To <douglas_cook@dot.ca.gov>
cc
bcc
Subject Corrosion Test Summary Report - EA: 08-0K710K, EFIS 0800000366 (Corr. #s CR110181 & CR110182)

Division of Engineering Services
Materials Engineering and Testing Services
Corrosion And Structural Concrete Field Investigation Branch
Report Date: 5/4/2011
Reported By: Lopez, Rudy

TEST SUMMARY REPORT - Soil/Water

Bridge Name: **DEVORE OH**
Bridge Number: **54-0818**
EA No.: **08-0K710K**
EFIS No.: **0800000366**
Dist/Co/Rte/PM or KP: **08 / SBD / 15 / 15.90**

SIC Number (TL101)	Sample Location	Sample Type	Sample Depth	Minimum Resistivity[1] (ohm-cm)	pH[2]	Chloride Content[3] (ppm)	Sulfate Content[4] (ppm)
C709257		SOIL	10.0 FT TO 11.5 FT/R-11-003	9903	7.87		
C709258		SOIL	65.0 FT TO 66.5 FT/R-11-003	14563	8.42		

This site is not corrosive to foundation elements (see note below for MSE wall backfill).

Note: For MSE wall structure backfill material, minimum resisitivity must be 2000 ohm-cm or greater,
pH must be between 5.5 and 10.0, chloride content must not be greater than 250 ppm, and sulfate content must not be greater than 500 ppm.

[1,2]CTM 643, [3]CTM 422, [4]CTM 417

<Rudy_C_Lopez@dot.ca.gov>
05/04/2011 12:10 PM

To <douglas_cook@dot.ca.gov>
cc
bcc
Subject Corrosion Test Summary Report - EA: 08-0K710K, EFIS 0800000366 (Corr. # CR110183)

Division of Engineering Services
Materials Engineering and Testing Services
Corrosion And Structural Concrete Field Investigation Branch
Report Date: 5/4/2011
Reported By: Lopez, Rudy

TEST SUMMARY REPORT - Soil/Water

Bridge Name: **CAJON CREEK**
Bridge Number: **54-0781R**
EA No.: **08-0K710K**
EFIS No.: **0800000366**
Dist/Co/Rte/PM or KP: **08 / SBD / 15 / 16.07**

SIC Number (TL101)	Sample Location	Sample Type	Sample Depth	Minimum Resistivity[1] (ohm-cm)	pH[2]	Chloride Content[3] (ppm)	Sulfate Content[4] (ppm)
C709260		SOIL	80.0 FT TO 81.5 FT/R-11-004	11948	8.44		

This site is not corrosive to foundation elements (see note below for MSE wall backfill).

Note: For MSE wall structure backfill material, minimum resisitivity must be 2000 ohm-cm or greater,
pH must be between 5.5 and 10.0, chloride content must not be greater than 250 ppm, and sulfate content must not be greater than 500 ppm.

[1,2]CTM 643, [3]CTM 422, [4]CTM 417

<Rudy_C_Lopez@dot.ca.gov>
05/04/2011 12:29 PM

To <douglas_cook@dot.ca.gov>
cc
bcc
Subject Corrosion Test Summary Report - EA: 08-0K710K, EFIS 0800000366 (Corr. # CR110186)

Division of Engineering Services
Materials Engineering and Testing Services
Corrosion And Structural Concrete Field Investigation Branch
Report Date: 5/4/2011
Reported By: Lopez, Rudy

TEST SUMMARY REPORT - Soil/Water

Bridge Name:
Bridge Number:
EA No.: **08-0K710K**
EFIS No.: **0800000366**
Dist/Co/Rte/PM or KP: **08 / SBD / 215 / 17.65**

SIC Number (TL101)	Sample Location	Sample Type	Sample Depth	Minimum Resistivity[1] (ohm-cm)	pH[2]	Chloride Content[3] (ppm)	Sulfate Content[4] (ppm)
C709263	W-S CONNECTOR	SOIL	10-11.5 FEET / BORE#R-10-006	13770	8.26		

This site is not corrosive to foundation elements (see note below for MSE wall backfill).

Note: For MSE wall structure backfill material, minimum resisitivity must be 2000 ohm-cm or greater,
pH must be between 5.5 and 10.0, chloride content must not be greater than 250 ppm, and sulfate content must not be greater than 500 ppm.

[1,2]CTM 643, [3]CTM 422, [4]CTM 417

<Rudy_C_Lopez@dot.ca.gov>
05/04/2011 12:58 PM

To <douglas_cook@dot.ca.gov>
cc
bcc
Subject Corrosion Test Summary Report - EA: 08-0K710K, EFIS 0800000366 (Corr. # CR110189)

Division of Engineering Services
Materials Engineering and Testing Services
Corrosion And Structural Concrete Field Investigation Branch
Report Date: 5/4/2011
Reported By: Lopez, Rudy

TEST SUMMARY REPORT - Soil/Water

Bridge Name: **N215-S15 CONNECTOR UC**
Bridge Number: **54-0782**
EA No.: **08-0K710K**
EFIS No.: **0800000366**
Dist/Co/Rte/PM or KP: **08 / SBD / 215 / 16.32**

SIC Number (TL101)	Sample Location	Sample Type	Sample Depth	Minimum Resistivity[1] (ohm-cm)	pH[2]	Chloride Content[3] (ppm)	Sulfate Content[4] (ppm)
C709266		SOIL	5.0 FT TO6.5 FT/R-10-008	11228	7.63		

This site is not corrosive to foundation elements (see note below for MSE wall backfill).

Note: For MSE wall structure backfill material, minimum resisitivity must be 2000 ohm-cm or greater,
pH must be between 5.5 and 10.0, chloride content must not be greater than 250 ppm, and sulfate content must not be greater than 500 ppm.

[1,2]CTM 643, [3]CTM 422, [4]CTM 417

<Rudy_C_Lopez@dot.ca.gov>

05/04/2011 02:46 PM

To <douglas_cook@dot.ca.gov>
cc
bcc
Subject Corrosion Test Summary Report - EA: 08-0K710K, EFIS 0800000366 (Corr. # CR110198)

Division of Engineering Services
Materials Engineering and Testing Services
Corrosion And Structural Concrete Field Investigation Branch
Report Date: 5/4/2011
Reported By: Lopez, Rudy

TEST SUMMARY REPORT - Soil/Water

Bridge Name:
Bridge Number:
EA No.: **08-0K710K**
EFIS No.: **0800000366**
Dist/Co/Rte/PM or KP: **08 / SBD / 215 / 17.1**

SIC Number (TL101)	Sample Location	Sample Type	Sample Depth	Minimum Resistivity[1] (ohm-cm)	pH[2]	Chloride Content[3] (ppm)	Sulfate Content[4] (ppm)
C709275		SOIL	5.0 FT TO 6.5 FT/R-10-019	14625	7.15		

This site is not corrosive to foundation elements (see note below for MSE wall backfill).

Note: For MSE wall structure backfill material, minimum resisitivity must be 2000 ohm-cm or greater,
pH must be between 5.5 and 10.0, chloride content must not be greater than 250 ppm, and sulfate content must not be greater than 500 ppm.

[1,2]CTM 643, [3]CTM 422, [4]CTM 417

<Rudy_C_Lopez@dot.ca.gov>

05/04/2011 02:40 PM

To <douglas_cook@dot.ca.gov>
cc
bcc
Subject Corrosion Test Summary Report - EA: 08-0K710K, EFIS 0800000366 (Corr. # CR110191-CR110197)

Division of Engineering Services
Materials Engineering and Testing Services
Corrosion And Structural Concrete Field Investigation Branch
Report Date: 5/4/2011
Reported By: Lopez, Rudy

TEST SUMMARY REPORT - Soil/Water

Bridge Name:
Bridge Number:
EA No.: **08-0K710K**
EFIS No.: **0800000366**
Dist/Co/Rte/PM or KP: **08 / SBD / 15 / Var**

SIC Number (TL101)	Sample Location	Sample Type	Sample Depth	Minimum Resistivity[1] (ohm-cm)	pH[2]	Chloride Content[3] (ppm)	Sulfate Content[4] (ppm)
C709268		SOIL	5.0 FT TO 6.5 FT/R-1-011	17362	8.39		
C709269		SOIL	5.0 FT TO 6.5 FT/R-11-012	9628	7.39		
C709270		SOIL	15.0 FT TO 16.5 FT/R-10-013	10869	7.40		
C709271		SOIL	10.0 FT TO 11.5 FT/R-11-014	1678	5.47		
C709272		SOIL	15.0 FT TO 16.5 FT/R-10-015	4485	7.13		
C709273		SOIL	5.0 FT TO 6.5 FT/R-11-016	16380	7.39		
C709274		SOIL	25.0 FT TO 26.5 FT/R-11-016	12285	6.87		

This site is corrosive (see note below for MSE wall backfill).

Controlling corrosion parameters are as follows:

- 5.47 pH
- 0 ppm Chloride
- 0 ppm Sulfate

Note: For MSE wall structure backfill material, minimum resisitivity must be 2000 ohm-cm or greater,
pH must be between 5.5 and 10.0, chloride content must not be greater than 250 ppm, and sulfate content must not be greater than 500 ppm.

[1,2]CTM 643, [3]CTM 422, [4]CTM 417

<Rudy_C_Lopez@dot.ca.gov>
05/04/2011 12:18 PM

To <douglas_cook@dot.ca.gov>
cc
bcc
Subject Corrosion Test Summary Report - EA: 08-0K710K, EFIS 0800000366 (Corr. # CR110184 & CR110185)

Division of Engineering Services
Materials Engineering and Testing Services
Corrosion And Structural Concrete Field Investigation Branch
Report Date: 5/4/2011
Reported By: Lopez, Rudy

TEST SUMMARY REPORT - Soil/Water

Bridge Name: **CAJON CREEK**
Bridge Number: **54-0781L**
EA No.: **08-0K710K**
EFIS No.: **0800000366**
Dist/Co/Rte/PM or KP: **08 / SBD / 15 / 16.07**

SIC Number (TL101)	Sample Location	Sample Type	Sample Depth	Minimum Resistivity[1] (ohm-cm)	pH[2]	Chloride Content[3] (ppm)	Sulfate Content[4] (ppm)
C709261	CAJON CREEK LEFT	SOIL	20-21.5 FEET / BORE#R-11-005	10530	7.37		
C709262	CAJON CREEK LEFT	SOIL	75-80 FEET / BORE#R-11-005	13740	8.14		

This site is not corrosive to foundation elements (see note below for MSE wall backfill).

Note: For MSE wall structure backfill material, minimum resisitivity must be 2000 ohm-cm or greater,
pH must be between 5.5 and 10.0, chloride content must not be greater than 250 ppm, and sulfate content must not be greater than 500 ppm.

[1,2]CTM 643, [3]CTM 422, [4]CTM 417

<Rudy_C_Lopez@dot.ca.gov>
05/04/2011 12:43 PM

To <douglas_cook@dot.ca.gov>
cc
bcc
Subject Corrosion Test Summary Report - EA: 08-0K710K, EFIS 0800000366 (Corr. # CR110187 & CR110188)

Division of Engineering Services
Materials Engineering and Testing Services
Corrosion And Structural Concrete Field Investigation Branch
Report Date: 5/4/2011
Reported By: Lopez, Rudy

TEST SUMMARY REPORT - Soil/Water

Bridge Name: **ROUTE 15/215 SEPARATION**
Bridge Number: **54-0783R**
EA No.: **08-0K710K**
EFIS No.: **0800000366**
Dist/Co/Rte/PM or KP: **08 / SBD / 215 / 17.74**

SIC Number (TL101)	Sample Location	Sample Type	Sample Depth	Minimum Resistivity[1] (ohm-cm)	pH[2]	Chloride Content[3] (ppm)	Sulfate Content[4] (ppm)
C709264	15/215 SEPERATION	SOIL	5-6.5 FEET / BORE# R-10-007	15995	8.43		
C709265		SOIL	10.0 FT TO11.5 FT/R-10-017	20745	7.58		

This site is not corrosive to foundation elements (see note below for MSE wall backfill).

Note: For MSE wall structure backfill material, minimum resisitivity must be 2000 ohm-cm or greater,
pH must be between 5.5 and 10.0, chloride content must not be greater than 250 ppm, and sulfate content must not be greater than 500 ppm.

[1,2]CTM 643, [3]CTM 422, [4]CTM 417

<Rudy_C_Lopez@dot.ca.gov>
05/04/2011 02:19 PM

To <douglas_cook@dot.ca.gov>
cc
bcc
Subject Corrosion Test Summary Report - EA: 08-0K710K, EFIS 0800000366 (Corr. # CR110190)

Division of Engineering Services
Materials Engineering and Testing Services
Corrosion And Structural Concrete Field Investigation Branch
Report Date: 5/4/2011
Reported By: Lopez, Rudy

TEST SUMMARY REPORT - Soil/Water

Bridge Name: **NEW DEVORE OC**
Bridge Number:
EA No.: **08-0K710K**
EFIS No.: **0800000366**
Dist/Co/Rte/PM or KP: **08 / SBD / 215 / 17.32**

SIC Number (TL101)	Sample Location	Sample Type	Sample Depth	Minimum Resistivity[1] (ohm-cm)	pH[2]	Chloride Content[3] (ppm)	Sulfate Content[4] (ppm)
C709267		SOIL	10.0 FT TO 11.5 FT/R-10-010	14820	8.48		

This site is not corrosive to foundation elements (see note below for MSE wall backfill).

Note: For MSE wall structure backfill material, minimum resisitivity must be 2000 ohm-cm or greater,
pH must be between 5.5 and 10.0, chloride content must not be greater than 250 ppm, and sulfate content must not be greater than 500 ppm.

[1,2]CTM 643, [3]CTM 422, [4]CTM 417

EXHIBIT 8-C

Fault Rapture Design Memo

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

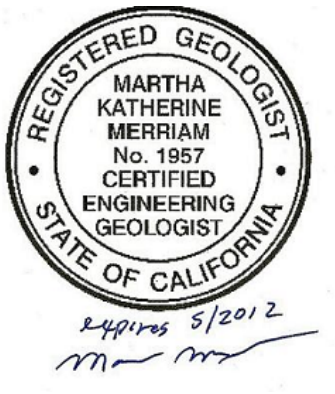
M e m o r a n d u m

Flex your power!
Be energy efficient!

To: Feiruz Aberra
Senior Bridge Engineer
Technical Liaison to District 8 and 11
Office of Bridge Design South 2

Date: October 18, 2011
Project: 0800000366
File: Devore IC
New/Widen
08-SBd-15 pm 14.7- 16
08-SBd-215 pm 17.3-17.8

From: Martha Merriam
Engineering Geologist – Geotechnical Design Services
Geotechnical Support



Subject: **Potential for fault rupture at new Devore Interchange Project**

I have summarized the potential for active faulting at the existing and proposed structures listed below included in the Devore Interchange Project.

Name	**Design for rupture?**	**Reference**
Existing Structures		
Devore Road OC (Replace) 54-0525	yes	(3,8)
Center Connector UC 54-0771	no	(3,5,8)
Kenwood Ave UC 54-0772L	no	(1,2,4)
Glen Helen Parkway UC (Widen) 54-0779L/R	no	(3,8
Glen Helen Road UC (Medan Widen) 54-0780L/R	no	(3,8)
Cajon Creek Bridge (Widen) 54-0781L/R	no	(3,8)
West Connector UC (Widen) 54-0782L	no	(3,5,8)

Route 15/215 Sep (Widen) 54-0783R	no	(3,5,8)
Devore OH (Widen) 54-0818L/R	no	(3,8)
Mathews Ranch Road UC (lengthen) 54-0915	no	(this memo)
New Structures		
Bridge Location 1: I215 Devore Offramp OC	no	(this memo)
Bridge Location 2: W-S Connector UC	no	(3,5,8)
Bridge Location 3: SB I215 Connector	no	(3,5,8)
Bridge Location 4: NB I-15 Truck By-Pass	yes	(1,2,4)
Bridge Location 5: SB (I-15 Truck By-Pass	no	(1,2,4)
Bridge Location 6: SB I215 Mainline over Kenwood Ave	no	(1,2,4)
Bridge Location 7: Kimbark Canyon Bridge	no	(this memo)

Devore Road OC (Figures 1, 3 and 4) needs to be designed for 1.3 ft lateral and .2 ft vertical movement. The movement would occur along a vertical fault plane ("unnamed lineament" in Figure 3) oriented approximately parallel to the bridge axis (Figure 3) (EMI, September 10, 2010). The entire structure needs to be designed for this hazard.

Bridge Location 4 (Figure 1; identified as NB I15 Truck Bypass in Figure 2) needs to be designed for 1.5 ft of vertical movement (south side up). This movement would occur along a vertical fault plane oriented in plan view roughly east-west as shown in Figure 2. The entire structure needs to be designed for this hazard.

None of 21 bridges listed above except these two requires design for fault rupture.

Fault Rupture Potential at Bridges Not Previously Studied

Bridge Locations 1, 4, 5, and 7 and Mathews Ranch Road UC were not included in the initial air photo lineament review performed by EMI in 2008 and accepted by Caltrans (Caltrans, Dec 10, 2008).

Bridge Locations 4 and 5 (Figures 1 and 2) were recently reviewed by Caltrans (Caltrans, Oct 5, 2011) after trenching results were available (EMI, July 15, 2011; Caltrans, August

30, 2011). Please refer to discussion of Bridge Location 4 above; Bridge 5 does not need to be designed for surface rupture based on trenching results.

Bridge Locations 1 and 7 (I15/215 IC) (Figures 1 and 4) are not underlain by known active faults, and there are no photo lineaments underlying or projecting toward these locations. Potential for surface rupture at these two locations is very low and no design for rupture is required.

Mathews Ranch Road UC (Figures 1, 5, and 6) is located approximately ½ mile from both the San Andreas Fault and the San Jacinto fault (Glen Helen fault) (figures 5 and 6). Potential for surface rupture at this location is very low and no design for rupture is required for this structure.

Please do not hesitate to contact me at 916-316-3925 if you have questions or comments.

References:

1. Caltrans, October 5, 2011, Potential faulting at proposed Kenwood Avenue structures, memo to Raghuram Radhakrishana from K. Douglas Cook and Martha Merriam.

2. Caltrans, August 30, 2011, Review of geologic investigations of the Peters fault at Kenwood Ave UC and photo lineaments indicative of a potential unnamed fault near the 15/215 Interchange, memo to Raghuram Radhakrishana from K. Douglas Cook and Martha Merriam.

3. Caltrans, December 10, 2008, Proposal to investigate surface rupture potential in the Project Area, memo to Mahmoud Khojasteh from Martha Merriam.

4. Caltrans, May 4, 2005, Evaluation of surface fault rupture potential at Kenwood Avenue Undercrossing, memo to Angel Perez-Cobo from Martha Merriam.

5. Drumond, Wendy, September 30, 2011, Summary of fault rupture hazard at Karodos Site, I-15/I-215 Interchange Reconfiguration Project, Devore Area, San Bernardino County, California.

6. EMI, July 15, 2011, Fault rupture investigation, I-15/215 Interchange Reconfiguration Project, Devore area, San Bernardino County, California (preliminary unsigned report).

7. EMI, September 10, 2010, Structure Preliminary Geotechnical Report for Project Report, Devore Road OC (Replace), Bridge No. 3A-12 I-15/I-215 Interchange Improvements Project, Alignment Alternative 3A, Devore, California.

8. EMI, November 5, 2008, Surface fault rupture evaluation, I-15/215 Interchange Improvement Project, Devore, San Bernardino County, California.

9. Morton, D., and Miller, F., 2006, Geologic map of the San Bernardino and Santa Ana 30' x 60' quadrangles, California: USGS OFR 2006-1217, scale 1:100,000: http://pubs.usgs.gov/of/2006/1217/

10. USGS, 2010, Google Earth fault files: http://earthquake.usgs.gov/hazards/qfaults/google.php

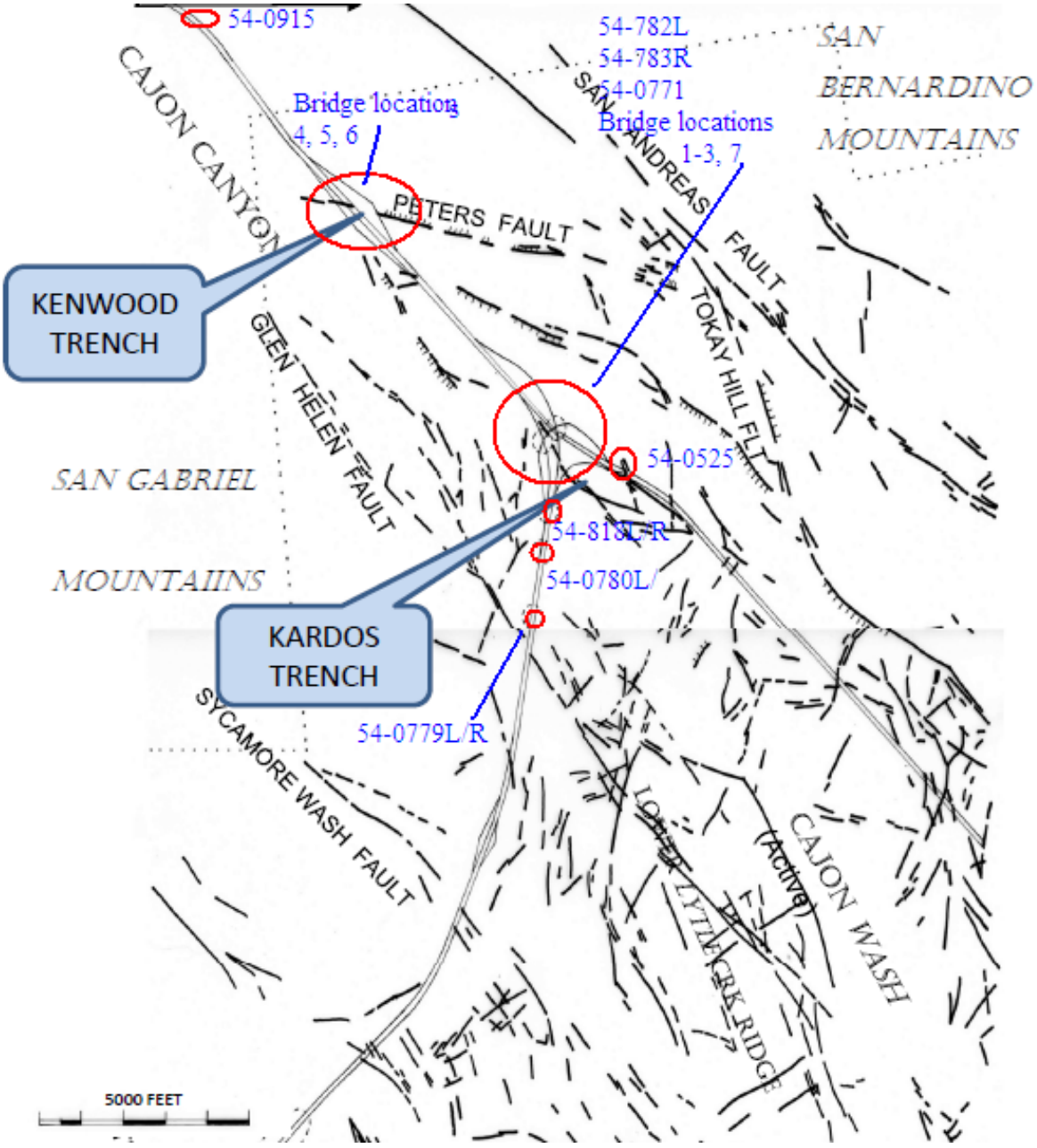


Figure 1. Lineament map developed by EMI in 2008 and used to guide trench locations. (from Figure 4 in EMI, July 15, 2011)

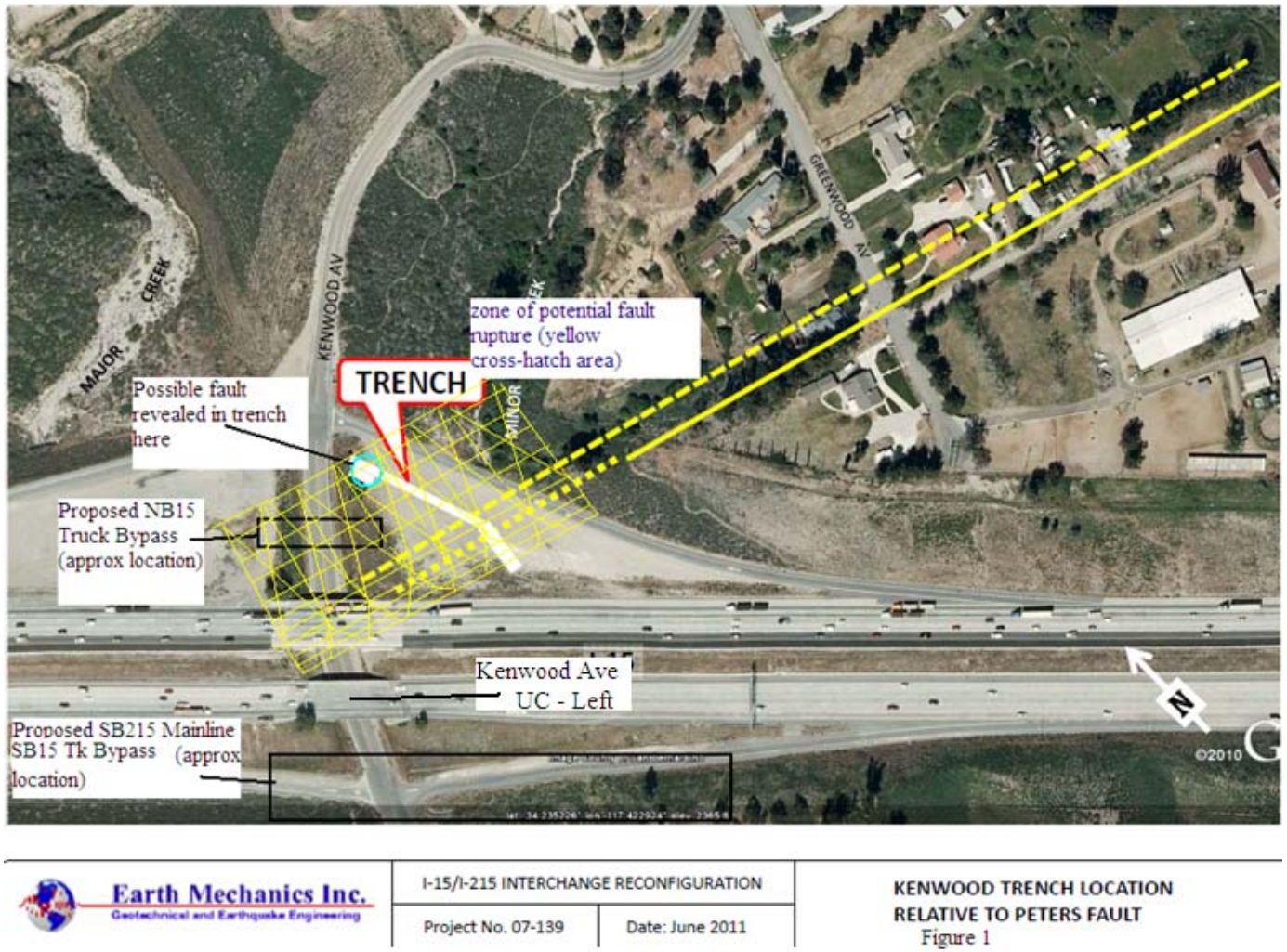


Figure 2. Kenwood trench. Yellow cross-hatching denotes area near the structures likely underlain by the Peters fault.

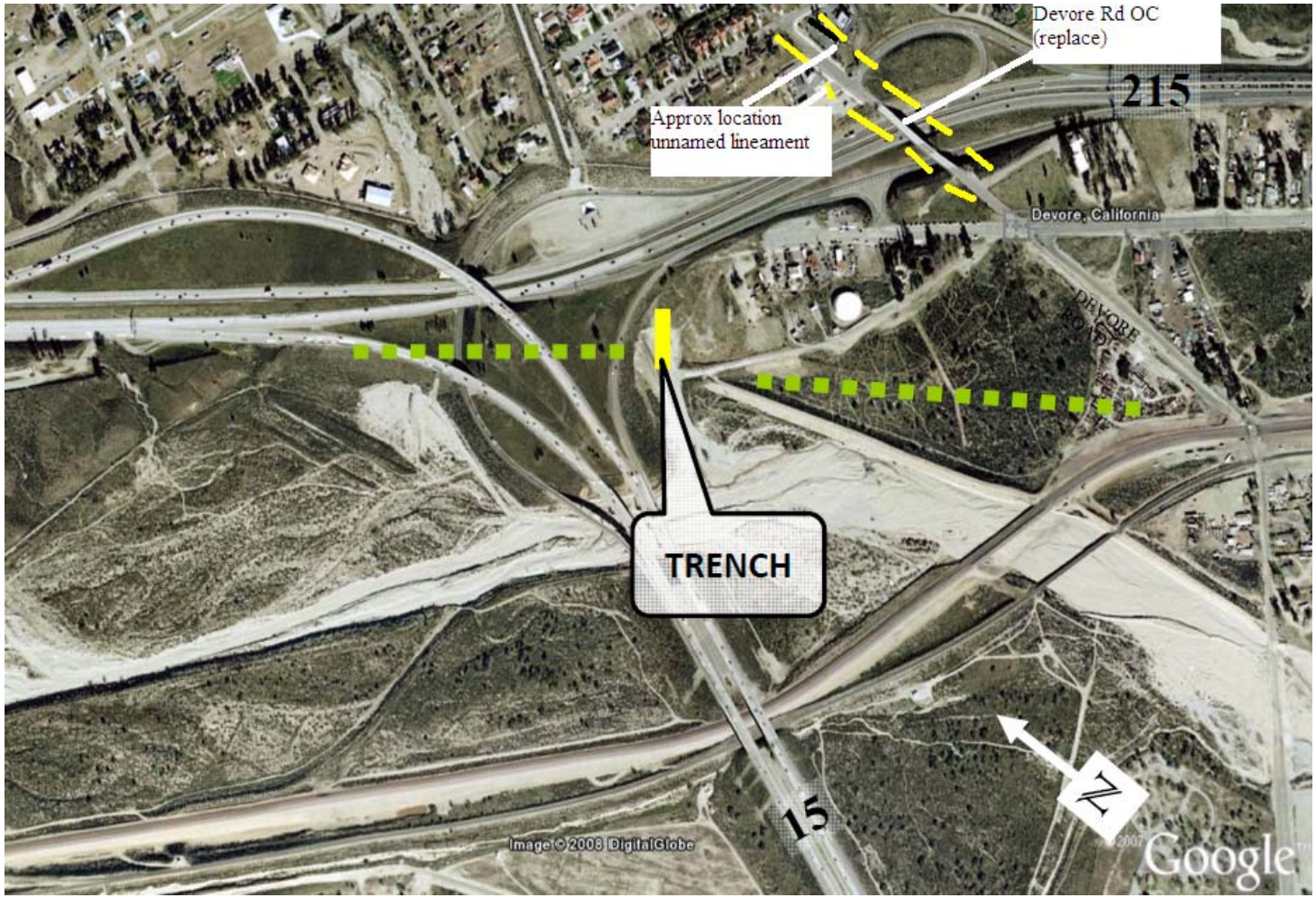


Figure 3. Kardos trench excavated SE of I15/215 IC. Lineament shown in Figure 1 is approximately located on this figure. The trench revealed no evidence of faulting . From Drumond, 2011. See Figure 4 for bridge locations.

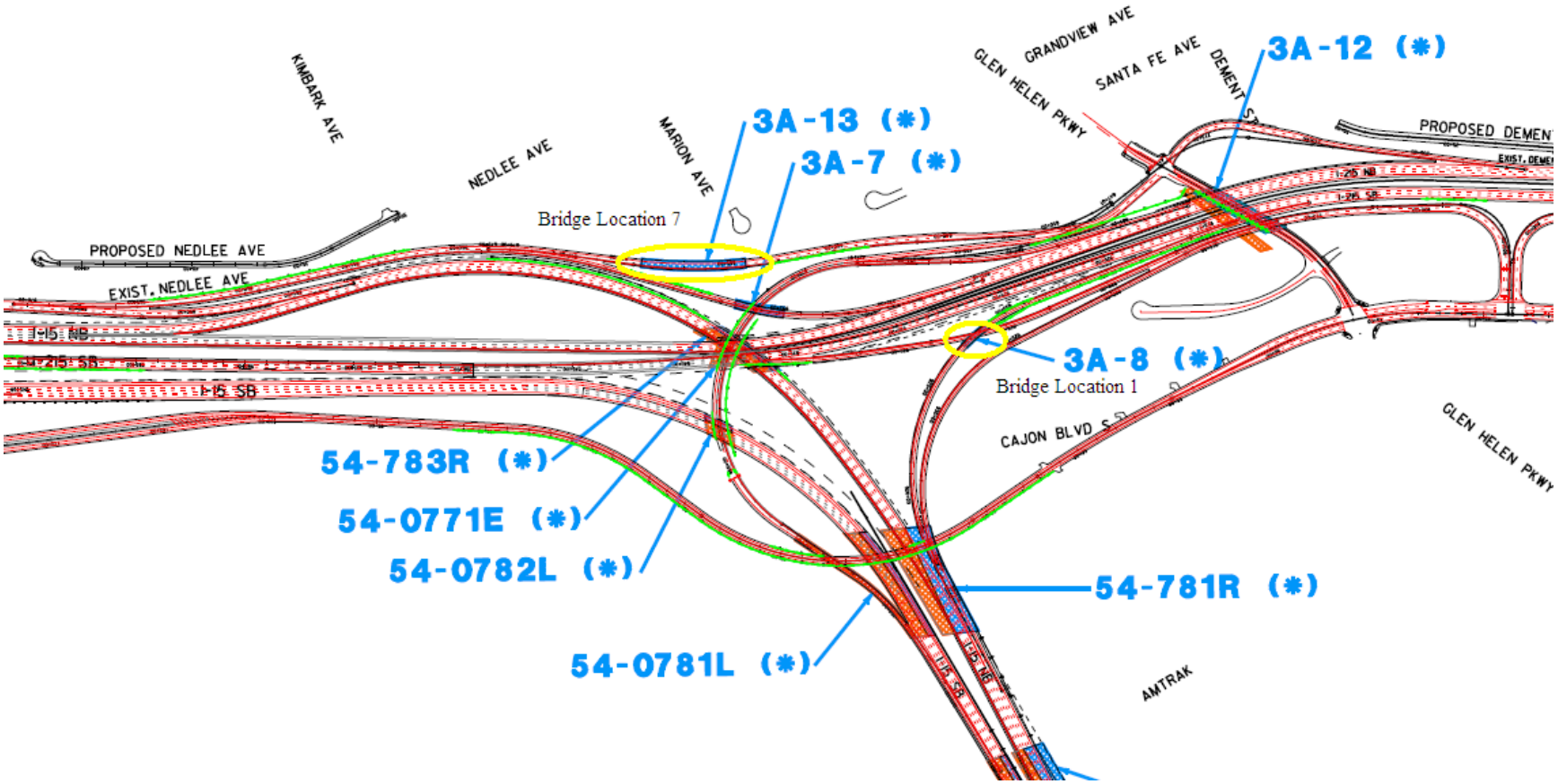


Figure 4. Bridge layout aerial (9/29/2011) showing Devore Interchange structures.

Figure 5. Location of Mathews Ranch Road UC. Structure is approximately ½ mile from the San Andreas and the San Jacinto faults. (Google Earth; USGS November 2010 faults)

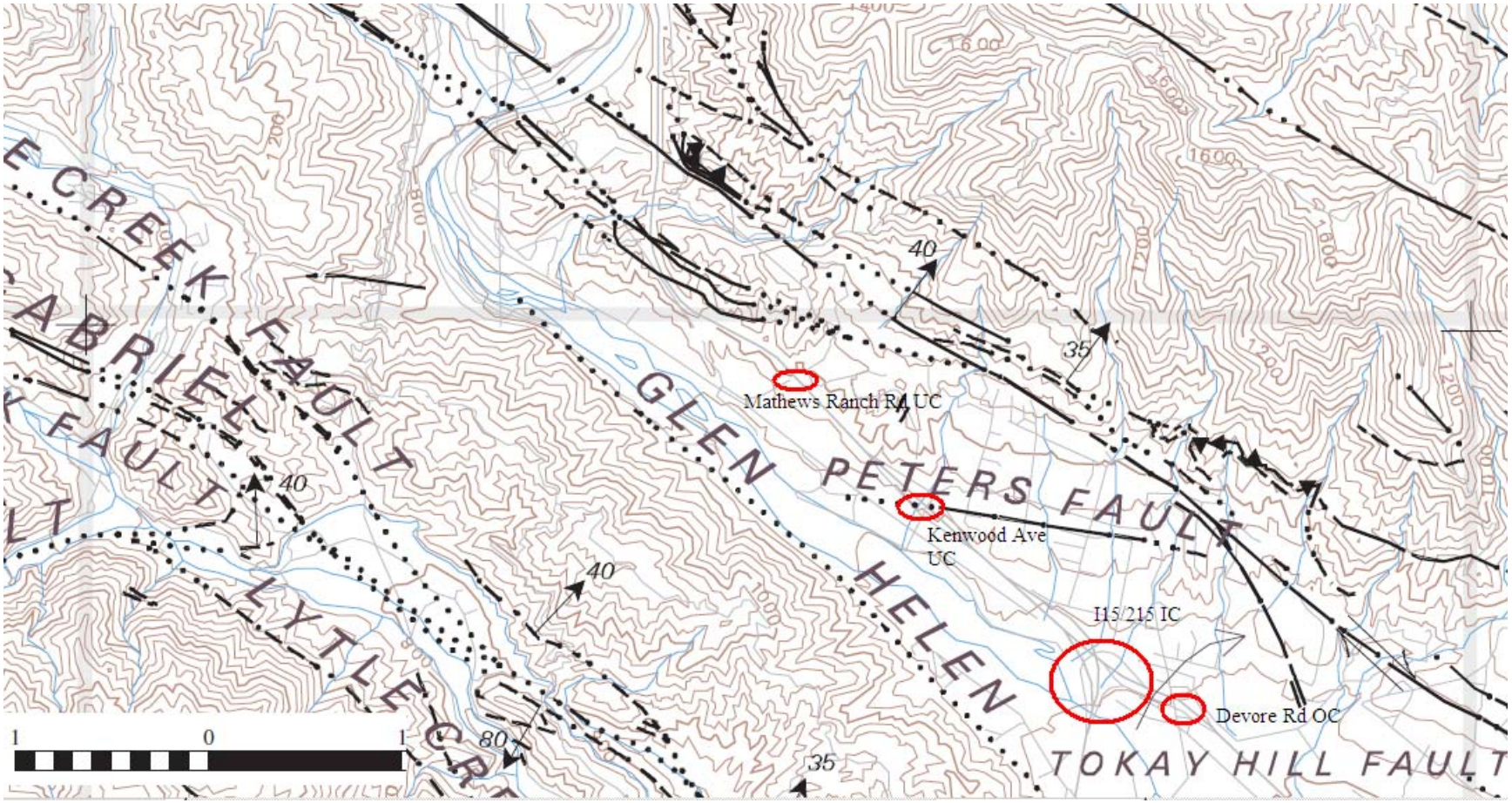


Figure 6. Location of Mathews Ranch Rd UC with respect to nearby faults. (Morton and Miller, 2006)

EXHIBIT 9-A

Survey Control Map

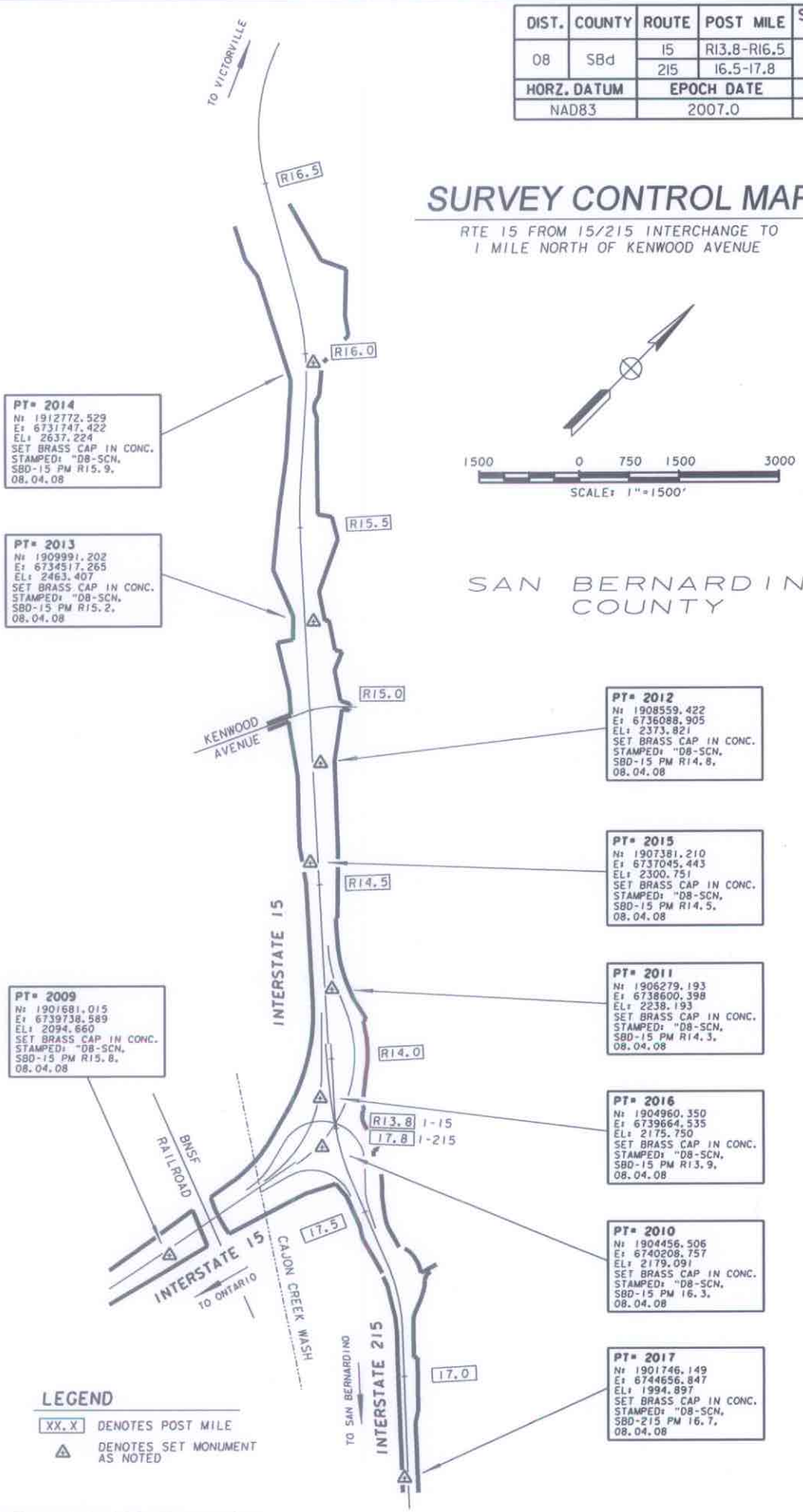
(Additional Information on the website ZIP File)

DIST.	COUNTY	ROUTE	POST MILE	SHEET NO.	TOTAL SHEETS
08	SBd	15	R13.8-R16.5	1	1
		215	16.5-17.8		
HORZ. DATUM		EPOCH DATE		VERT. DATUM	
NAD83		2007.0		NAVD88	

SURVEY CONTROL MAP

RTE 15 FROM 15/215 INTERCHANGE TO
1 MILE NORTH OF KENWOOD AVENUE

SAN BERNARDINO COUNTY



LEGEND

XX.X DENOTES POST MILE

△ DENOTES SET MONUMENT AS NOTED

Associated Engineers, Inc.
331 EAST SHELBY STREET ONTARIO, CA . 91764
TEL. (909) 980-1982 FAX: (909) 941-0891

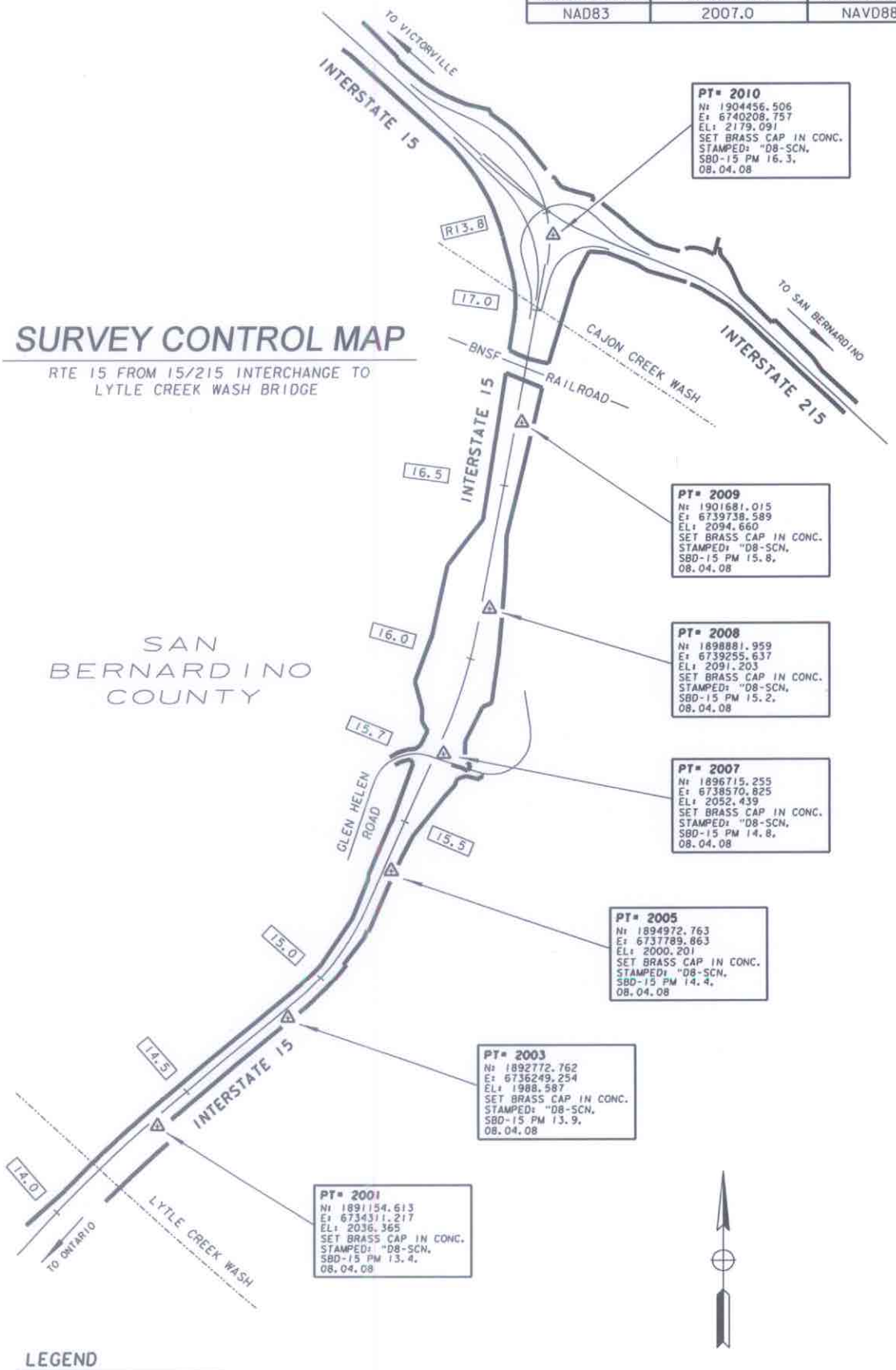
PREPARED BY	DATE	REVIEWED BY	DATE
JLE/GG	12/11/08	JLE/MW	12/11/08

...\scmdevore 15n.dan Dec. 12. 2008 08:23:07

DIST.	COUNTY	ROUTE	POST MILE	SHEET NO.	TOTAL SHEETS
08	SBd	15	14.0-R13.8	1	1
HORZ. DATUM		EPOCH DATE		VERT. DATUM	
NAD83		2007.0		NAVD88	

SURVEY CONTROL MAP

RTE 15 FROM 15/215 INTERCHANGE TO LYTLE CREEK WASH BRIDGE



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E: 6740208.757
EL: 2179.091
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PT= 2009
N: 1901681.015
E: 6739738.589
EL: 2094.660
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STAMPED: "D8-SCN, SBD-15 PM 15.8, 08.04.08

PT= 2008
N: 1898881.959
E: 6739255.637
EL: 2091.203
SET BRASS CAP IN CONC.
STAMPED: "D8-SCN, SBD-15 PM 15.2, 08.04.08

PT= 2007
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EL: 2052.439
SET BRASS CAP IN CONC.
STAMPED: "D8-SCN, SBD-15 PM 14.8, 08.04.08

PT= 2005
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E: 6737789.863
EL: 2000.201
SET BRASS CAP IN CONC.
STAMPED: "D8-SCN, SBD-15 PM 14.4, 08.04.08

PT= 2003
N: 1892772.762
E: 6736249.254
EL: 1988.587
SET BRASS CAP IN CONC.
STAMPED: "D8-SCN, SBD-15 PM 13.9, 08.04.08

PT= 2001
N: 1891154.613
E: 6734311.217
EL: 2036.365
SET BRASS CAP IN CONC.
STAMPED: "D8-SCN, SBD-15 PM 13.4, 08.04.08

LEGEND

[XX.X] DENOTES POST MILE

△ DENOTES SET MONUMENT AS NOTED

1500 0 750 1500 3000

SCALE: 1"=1500'

Associated Engineers, Inc.
331 EAST SHELBY STREET ONTARIO, CA . 91764
TEL. (909) 980-1982 FAX: (909) 941-0891

PREPARED BY	DATE	REVIEWED BY	DATE
JLE/GG	12/11/08	JLE/MW	12/11/08

...\scmdevore 15s.dan Dec. 12. 2008 08:26:30

State of California Department of Transportation Office of Land Surveying
District 8

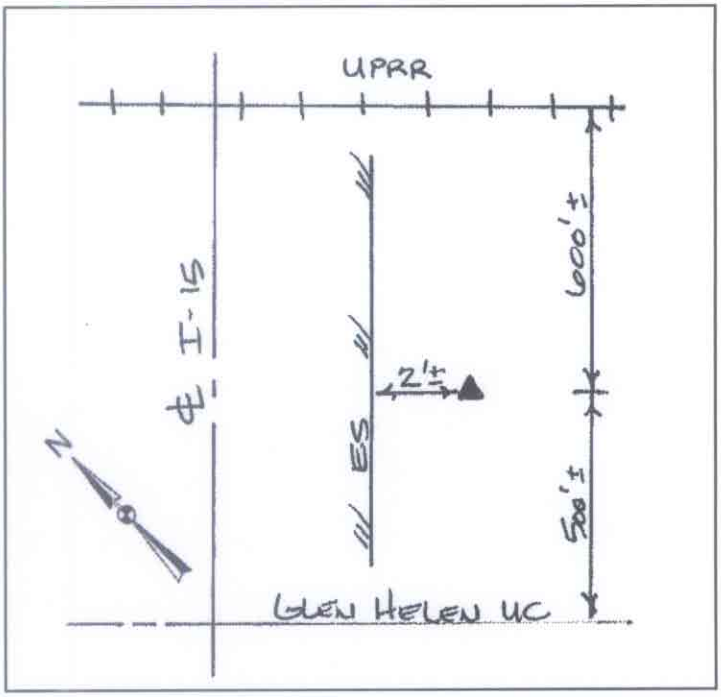
SURVEY CONTROL NETWORK DATA SHEET

Designation: 2009

Stamping: D8-SCN SBD-15 PM 15.8

Date: 08/04/08

Monument Description:
2 ½" Brass Disk in Concrete



CURRENT HORIZONTAL

DATUM: NAD 83 **EPOCH** : NSRS2007 **METHOD**: Fast Static GPS **CCS83 Zone** : 5

Geodetic Coordinates		**Degrees**	**Minutes**	**Seconds**	
Latitude	:	034 °	12'	59.28805"	N
Longitude	:	117 °	24'	39.50626"	W

N/E

Northing	:	1901681.015
Easting	:	6739738.589

Ellipsoidal Height : 1989.077 (ft) **Combined Factor (CGF)**: 0.99987020

VERTICAL (orthometric height)

	US Survey Feet	Method	Accuracy	Survey By	Reference
NAVD88:	2094.660	Differential Level	Second Order	AE	N/A

NGVD29:

PREVIOUS HORIZONTAL

EPOCH	METHOD	SURVEY BY	REFERENCE

New monument, no previous reference

Survey Provided By:

Associated Engineers, Inc.
A SUBSIDIARY OF PARSONS BRINCKERHOFF
3311 E. SHELBY ST. · ONTARIO, CA 91764-4872
TEL: (909) 980-1982 · FAX: (909) 941-0891

Co: SB Rte: 15 PM: 15.8

State of California Department of Transportation Office of Land Surveying
District 8

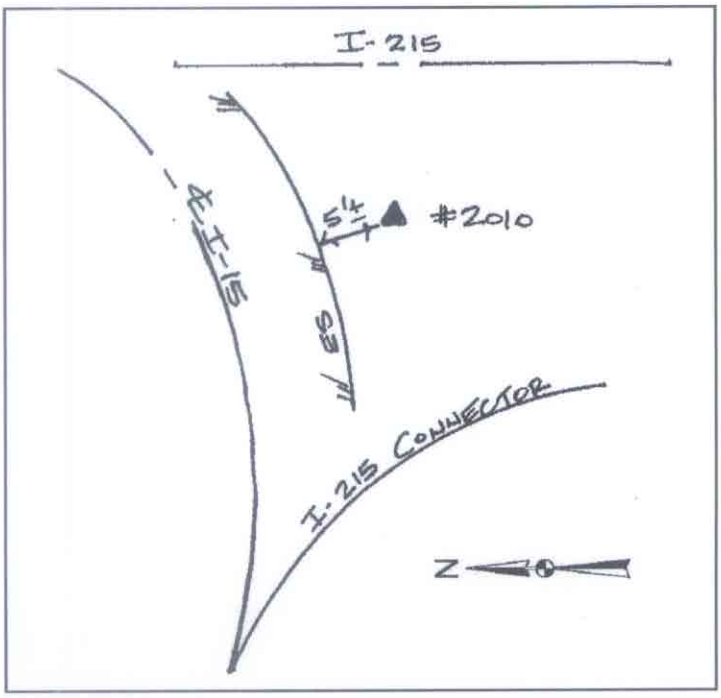
SURVEY CONTROL NETWORK DATA SHEET

Designation: 2010

Stamping: D8-SCN SBD-15 PM 16.3

Date: 08/04/08

Monument Description:
2 ½" Brass Disk in Concrete



CURRENT HORIZONTAL

DATUM: NAD 83 **EPOCH** : NSRS2007 **METHOD**: Fast Static GPS **CCS83 Zone** : 5

Geodetic Coordinates		Degrees	Minutes	Seconds
Latitude	:	034 °	13 '	26.71637 " N
Longitude	:	117 °	24 '	33.71339 " W

N/E

Northing	:	1904456.506
Easting	:	6740208.757

Ellipsoidal Height : 2073.623 (ft) **Combined Factor (CGF)**: 0.99986493

VERTICAL (orthometric height)

	US Survey Feet	Method	Accuracy	Survey By	Reference
NAVD88:	2179.092	Differential Level	Second Order	AE	N/A

NGVD29:

PREVIOUS HORIZONTAL

EPOCH	METHOD	SURVEY BY	REFERENCE

New monument, no previous reference

Survey Provided By:

Associated Engineers, Inc.
A SUBSIDIARY OF PARSONS BRINCKERHOFF
3311 E. SHELBY ST. · ONTARIO, CA 91764-4872
TEL: (909) 980-1982 · FAX: (909) 941-0891

Co: SB Rte: 15 PM: 16.3

State of California Department of Transportation Office of Land Surveying
District 8

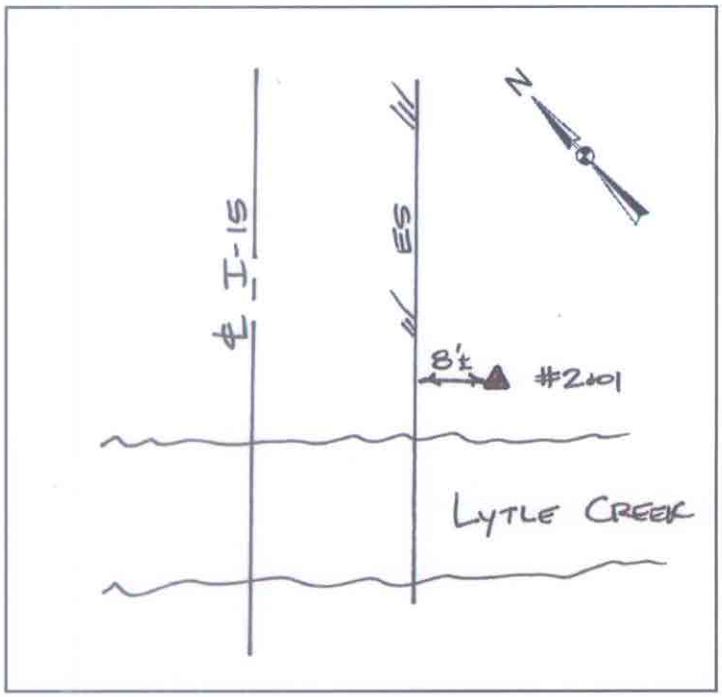
SURVEY CONTROL NETWORK DATA SHEET

Designation: 2001

Stamping: D8-SCN SBD-15 PM 13.4

Date: 08/04/08

Monument Description:
2 ½" Brass Disk in Concrete



CURRENT HORIZONTAL

DATUM: NAD 83 **EPOCH** : NSRS2007 **METHOD**: Fast Static GPS **CCS83 Zone** : 5

Geodetic Coordinates		Degrees	Minutes	Seconds
Latitude	:	034 °	11 '	15.46886 " N
Longitude	:	117 °	25 '	44.84630 " W

N/E

Northing	:	1891154.613
Easting	:	6734311.217

Ellipsoidal Height : 1930.245 (ft) **Combined Factor (CGF)**: 0.99987780

VERTICAL (orthometric height)

	US Survey Feet	Method	Accuracy	Survey By	Reference
NAVD88:	2036.365	Differential Level	Second Order	AE	N/A

NGVD29:

PREVIOUS HORIZONTAL

EPOCH	METHOD	SURVEY BY	REFERENCE

New monument, no previous reference

Survey Provided By:

Associated Engineers, Inc.
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State of California Department of Transportation Office of Land Surveying
District 8

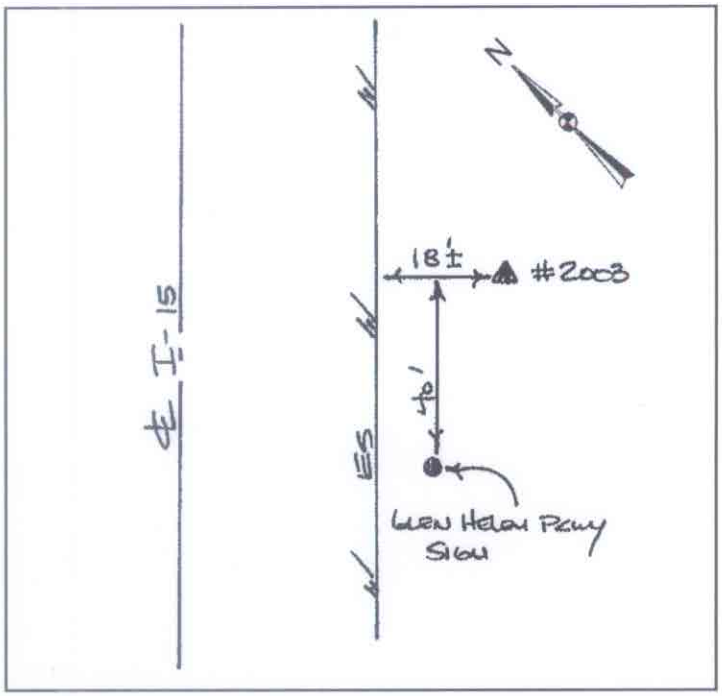
SURVEY CONTROL NETWORK DATA SHEET

Designation: 2003

Stamping: D8-SCN SBD-15 PM 13.9

Date: 08/04/08

Monument Description:
2 ½" Brass Disk in Concrete



CURRENT HORIZONTAL

DATUM: NAD 83 **EPOCH** : NSRS2007 **METHOD**: Fast Static GPS **CCS83 Zone** : 5

Geodetic Coordinates		Degrees	Minutes	Seconds	
Latitude	:	034 °	11'	31.36637"	N
Longitude	:	117 °	25'	21.66586"	W

N/E

Northing	:	1892772.762
Easting	:	6736249.254

Ellipsoidal Height : 1882.517 (ft) **Combined Factor (CGF)**: 0.99987933

VERTICAL (orthometric height)

	US Survey Feet	Method	Accuracy	Survey By	Reference
NAVD88:	1988.587	Differential Level	Second Order	AE	N/A

NGVD29:

PREVIOUS HORIZONTAL

EPOCH	METHOD	SURVEY BY	REFERENCE

New monument, no previous reference

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Co: SB Rte: 15 PM: 13.9

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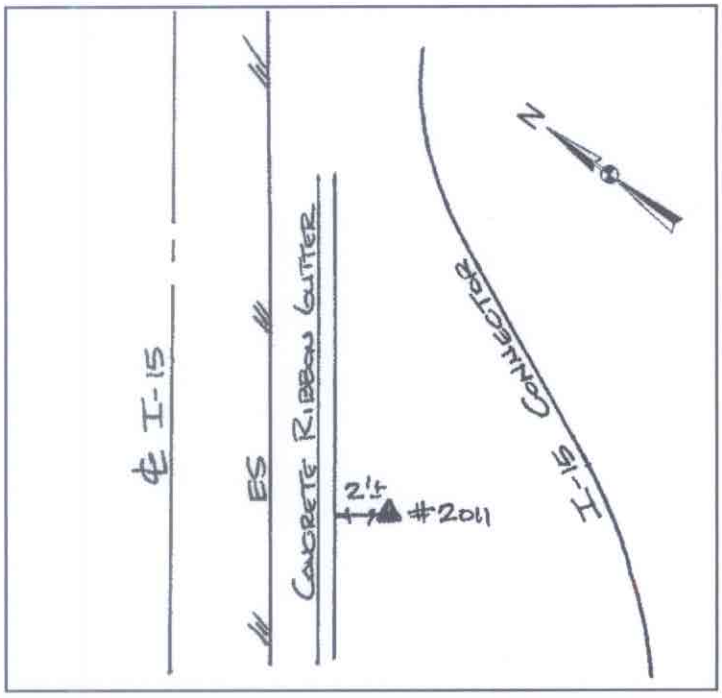
SURVEY CONTROL NETWORK DATA SHEET

Designation: 2011

Stamping: D8-SCN SBD-15 PM R14.3

Date: 08/04/08

Monument Description:
2 ½" Brass Disk in Concrete



CURRENT HORIZONTAL

DATUM: NAD 83 **EPOCH** : NSRS2007 **METHOD**: Fast Static GPS **CCS83 Zone** : 5

Geodetic Coordinates		Degrees	Minutes	Seconds	
Latitude	:	034 º	13 '	44.83977"	N
Longitude	:	117 º	24 '	52.74076"	W

N/E

Northing	:	1906279.193
Easting	:	6738600.398

Ellipsoidal Height : 2132.897 (ft) **Combined Factor (CGF)**: 0.99986130

VERTICAL (orthometric height)

	US Survey Feet	Method	Accuracy	Survey By	Reference
NAVD88:	2238.193	Differential Level	Second Order	AE	N/A

NGVD29:

PREVIOUS HORIZONTAL

EPOCH	METHOD	SURVEY BY	REFERENCE

New monument, no previous reference

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Co: SB Rte: 15 PM: 14.3

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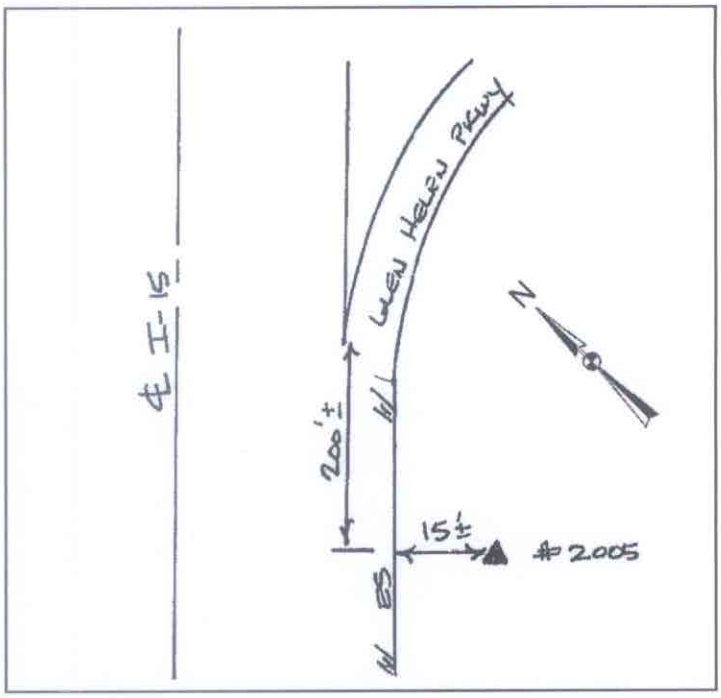
SURVEY CONTROL NETWORK DATA SHEET

Designation: 2005

Stamping: D8-SCN SBD-15 PM 14.4

Date: 08/04/08

Monument Description:
2 ½" Brass Disk in Concrete



CURRENT HORIZONTAL

DATUM: NAD 83 **EPOCH** : NSRS2007 **METHOD**: Fast Static GPS **CCS83 Zone** : 5

Geodetic Coordinates		Degrees	Minutes	Seconds	
Latitude	:	034°	11 '	53.04123"	N
Longitude	:	117°	25 '	03.17419"	W

N/E

Northing	:	1894972.763
Easting	:	6737789.863

Ellipsoidal Height : 1894.252 (ft) **Combined Factor (CGF)**: 0.99987776

VERTICAL (orthometric height)

	US Survey Feet	Method	Accuracy	Survey By	Reference
NAVD88:	2000.201	Differential Level	Second Order	AE	N/A

NGVD29:

PREVIOUS HORIZONTAL

EPOCH	METHOD	SURVEY BY	REFERENCE

New monument, no previous reference

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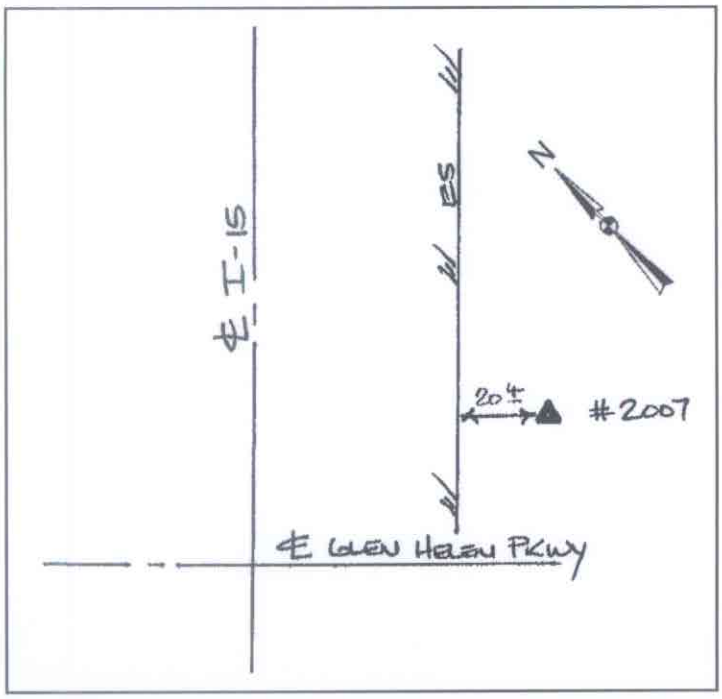
SURVEY CONTROL NETWORK DATA SHEET

Designation: 2007

Stamping: D8-SCN SBD-15 PM 14.8

Date: 08/04/08

Monument Description:
2 ½" Brass Disk in Concrete



CURRENT HORIZONTAL

DATUM: NAD 83 **EPOCH** : NSRS2007 **METHOD**: Fast Static GPS **CCS83 Zone** : 5

Geodetic Coordinates		**Degrees**	**Minutes**	**Seconds**	
Latitude	:	034 º	12 '	10.23339 "	N
Longitude	:	117 º	24 '	53.75595 "	W

N/E

Northing	:	1896715.255
Easting	:	6738570.825

Ellipsoidal Height : 1946.569 (ft) **Combined Factor (CGF)**: 0.99987446

VERTICAL (orthometric height)

	US Survey Feet	**Method**	**Accuracy**	**Survey By**	**Reference**
NAVD88:	2052.439	Differential Level	Second Order	AE	N/A

NGVD29:

PREVIOUS HORIZONTAL

EPOCH	**METHOD**	**SURVEY BY**	**REFERENCE**

New monument, no previous reference

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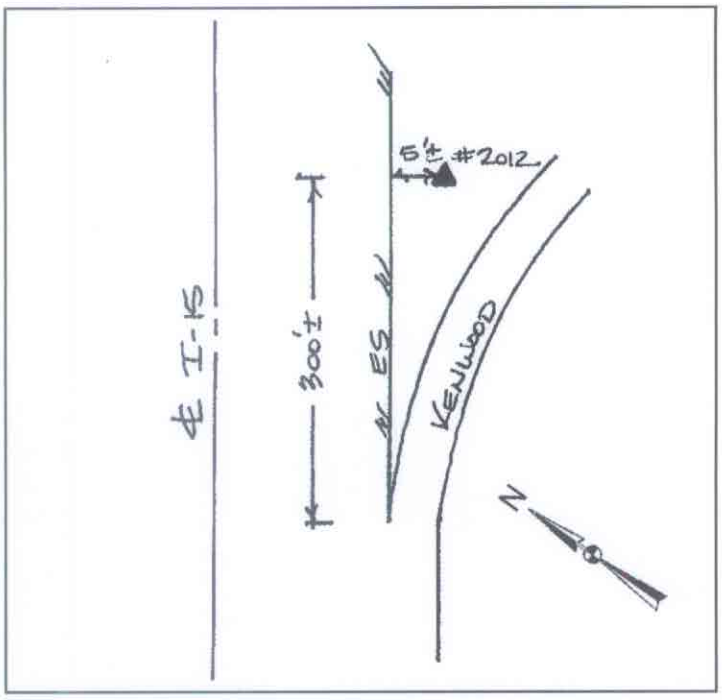
SURVEY CONTROL NETWORK DATA SHEET

Designation: 2012

Stamping: D8-SCN SBD-15 PM R14.8

Date: 08/04/08

Monument Description:
2 ½" Brass Disk in Concrete



CURRENT HORIZONTAL

DATUM: NAD 83 **EPOCH** : NSRS2007 **METHOD**: Fast Static GPS **CCS83 Zone** : 5

Geodetic Coordinates		Degrees	Minutes	Seconds	
Latitude	:	034 °	14 '	07.53983"	N
Longitude	:	117 °	25 '	22.49576"	W

N/E

Northing	:	1908559.422
Easting	:	6736088.905

Ellipsoidal Height : 2268.688 (ft) **Combined Factor (CGF)**: 0.99985382

VERTICAL (orthometric height)

	US Survey Feet	Method	Accuracy	Survey By	Reference
NAVD88:	2373.821	Differential Level	Second Order	AE	N/A

NGVD29:

PREVIOUS HORIZONTAL

EPOCH	METHOD	SURVEY BY	REFERENCE

New monument, no previous reference

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Co: SB Rte: 15 PM: 14.8

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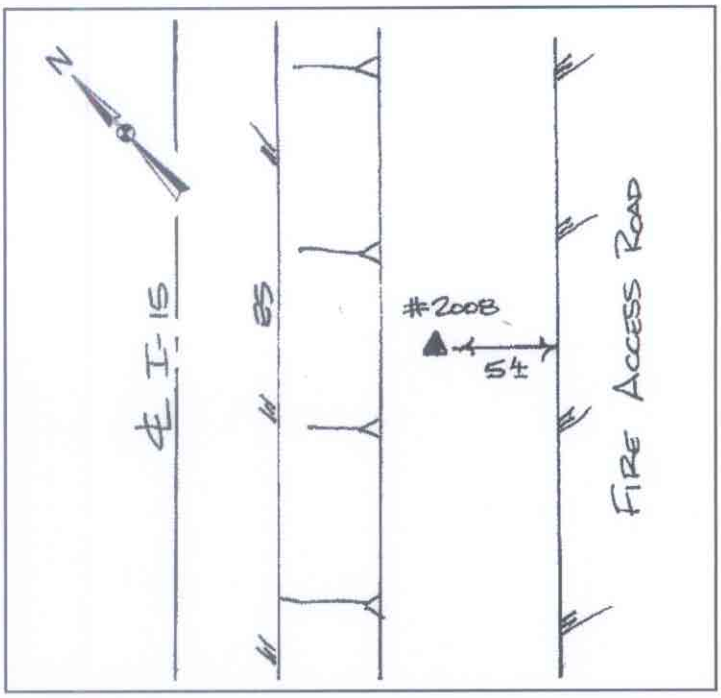
SURVEY CONTROL NETWORK DATA SHEET

Designation: 2008

Stamping: D8-SCN SBD-15 PM 15.2
CDOT

Date: 08/04/08

Monument Description:
2 ½" Brass Disk in Concrete



CURRENT HORIZONTAL

DATUM: NAD 83 **EPOCH** : NSRS2007 **METHOD**: Fast Static GPS **CCS83 Zone** : 5

Geodetic Coordinates		**Degrees**	**Minutes**	**Seconds**	
Latitude	:	034 °	12 '	31.62728"	N
Longitude	:	117 °	24 '	45.45193"	W

N/E

Northing	:	1898881.959
Easting	:	6739255.637

Ellipsoidal Height : 1985.421 (ft) **Combined Factor (CGF)**: 0.99987163

VERTICAL (orthometric height)

	US Survey Feet	**Method**	**Accuracy**	**Survey By**	**Reference**
NAVD88:	2091.203	Differential Level	Second Order	AE	N/A

NGVD29:

PREVIOUS HORIZONTAL

EPOCH	**METHOD**	**SURVEY BY**	**REFERENCE**

New monument, no previous reference

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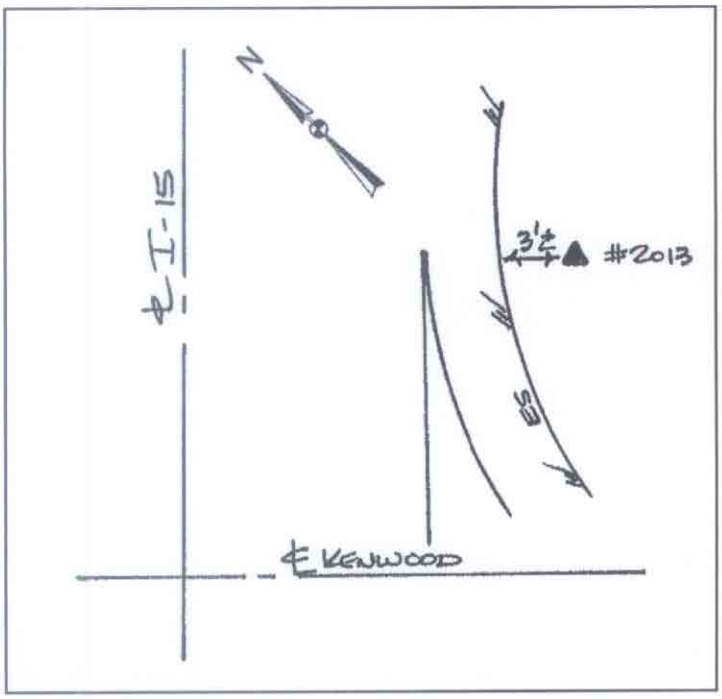
SURVEY CONTROL NETWORK DATA SHEET

Designation: 2013

Stamping: D8-SCN SBD-15 PM R15.2

Date: 08/04/08

Monument Description:
2 ½" Brass Disk in Concrete



CURRENT HORIZONTAL

DATUM: NAD 83 **EPOCH** : NSRS2007 **METHOD**: Fast Static GPS **CCS83 Zone** : 5

Geodetic Coordinates		Degrees	Minutes	Seconds	
Latitude	:	034 °	14 '	21.79211"	N
Longitude	:	117 °	25 '	41.11777"	W

N/E

Northing	:	1909991.202
Easting	:	6734517.265

Ellipsoidal Height : 2358.424 (ft) **Combined Factor (CGF)**: 0.99984891

VERTICAL (orthometric height)

	US Survey Feet	Method	Accuracy	Survey By	Reference
NAVD88:	2463.407	Differential Level	Second Order	AE	N/A

NGVD29:

PREVIOUS HORIZONTAL

EPOCH	METHOD	SURVEY BY	REFERENCE

New monument, no previous reference

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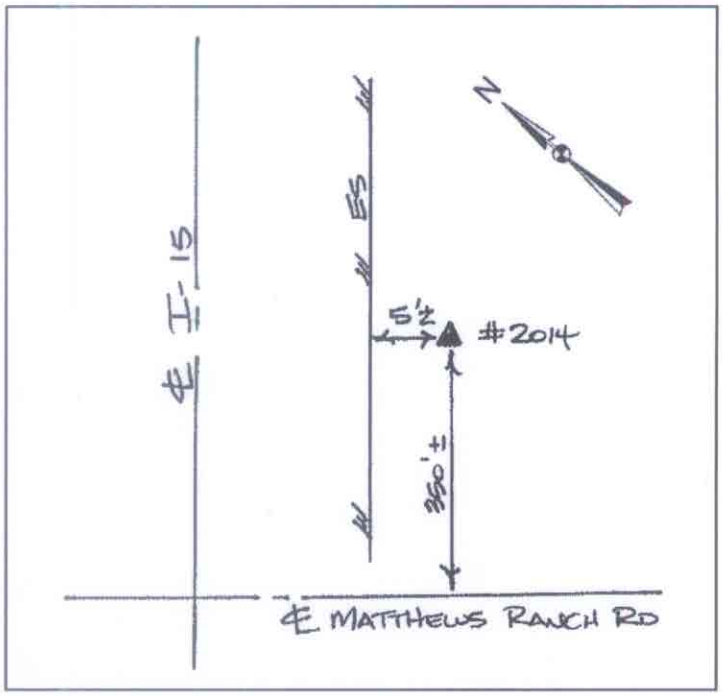
SURVEY CONTROL NETWORK DATA SHEET

Designation: 2014

Stamping: D8-SCN SBD-15 PM R15.9

Date: 08/04/08

Monument Description:
2 ½" Brass Disk in Concrete



CURRENT HORIZONTAL

DATUM: NAD 83 **EPOCH** : NSRS2007 **METHOD**: Fast Static GPS **CCS83 Zone** : 5

Geodetic Coordinates		Degrees	Minutes	Seconds	
Latitude	:	034 °	14 '	49.46014 "	N
Longitude	:	117 °	26 '	13.92413 "	W

N/E

Northing	:	1912772.529
Easting	:	6731747.422

Ellipsoidal Height : 2532.346 (ft) **Combined Factor (CGF)**: 0.99983941

VERTICAL (orthometric height)

	US Survey Feet	Method	Accuracy	Survey By	Reference
NAVD88:	2637.224	Differential Level	Second Order	AE	N/A

NGVD29:

PREVIOUS HORIZONTAL

EPOCH	METHOD	SURVEY BY	REFERENCE

New monument, no previous reference

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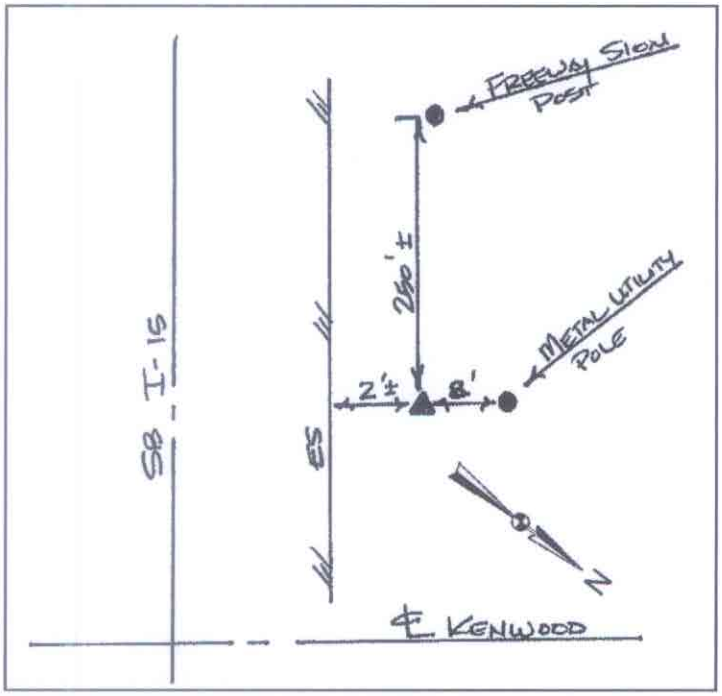
SURVEY CONTROL NETWORK DATA SHEET

Designation: 2015

Stamping: D8-SCN SBD-15 PM R14.5

Date: 08/04/08

Monument Description:
2 ½" Brass Disk in Concrete



CURRENT HORIZONTAL

DATUM: NAD 83 **EPOCH** : NSRS2007 **METHOD**: Fast Static GPS **CCS83 Zone** : 5

Geodetic Coordinates		Degrees	Minutes	Seconds	
Latitude	:	034 °	13 '	55.83029"	N
Longitude	:	117 °	25 '	11.18390"	W

N/E

Northing	:	1907381.210
Easting	:	6737045.443

Ellipsoidal Height : 2195.520 (ft) **Combined Factor (CGF)**: 0.99983941

VERTICAL (orthometric height)

	US Survey Feet	Method	Accuracy	Survey By	Reference
NAVD88:	2300.751	Differential Level	Second Order	AE	N/A

NGVD29:

PREVIOUS HORIZONTAL

EPOCH	METHOD	SURVEY BY	REFERENCE

New monument, no previous reference

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Co: SB Rte: 15 PM: 14.5

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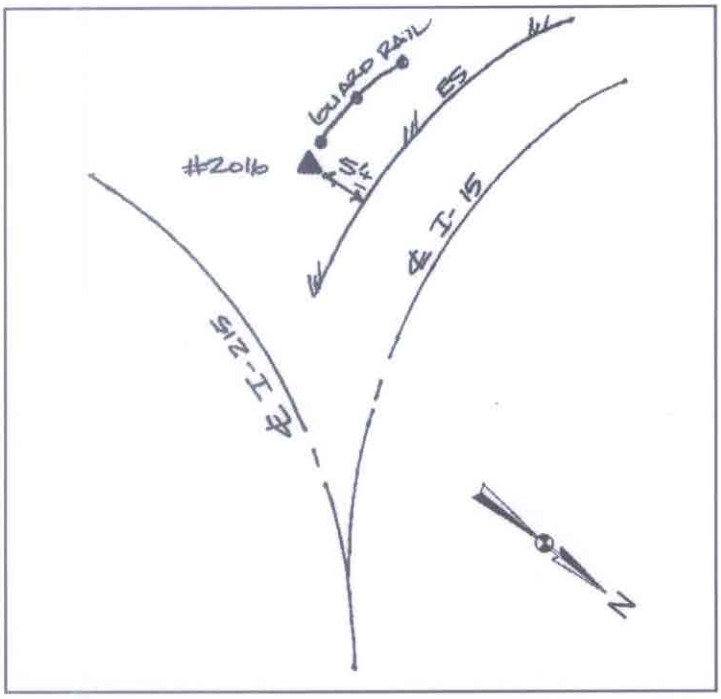
SURVEY CONTROL NETWORK DATA SHEET

Designation: 2016

Stamping: D8-SCN SBD-15 PM R13.9

Date: 08/04/08

Monument Description:
2 ½" Brass Disk in Concrete



CURRENT HORIZONTAL

DATUM: NAD 83 **EPOCH** : NSRS2007 **METHOD**: Fast Static GPS **CCS83 Zone** : 5

Geodetic Coordinates		Degrees	Minutes	Seconds	
Latitude	:	034 °	13 '	31.73207"	N
Longitude	:	117 °	24 '	40.15931"	W

N/E

Northing	:	1904960.350
Easting	:	6739664.535

Ellipsoidal Height : 2070.427 (ft) **Combined Factor (CGF)**: 0.99986487

VERTICAL (orthometric height)

	US Survey Feet	Method	Accuracy	Survey By	Reference
NAVD88:	2175.750	Differential Level	Second Order	AE	N/A

NGVD29:

PREVIOUS HORIZONTAL

EPOCH	METHOD	SURVEY BY	REFERENCE

New monument, no previous reference

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Co: SB Rte: 15 PM: 13.9

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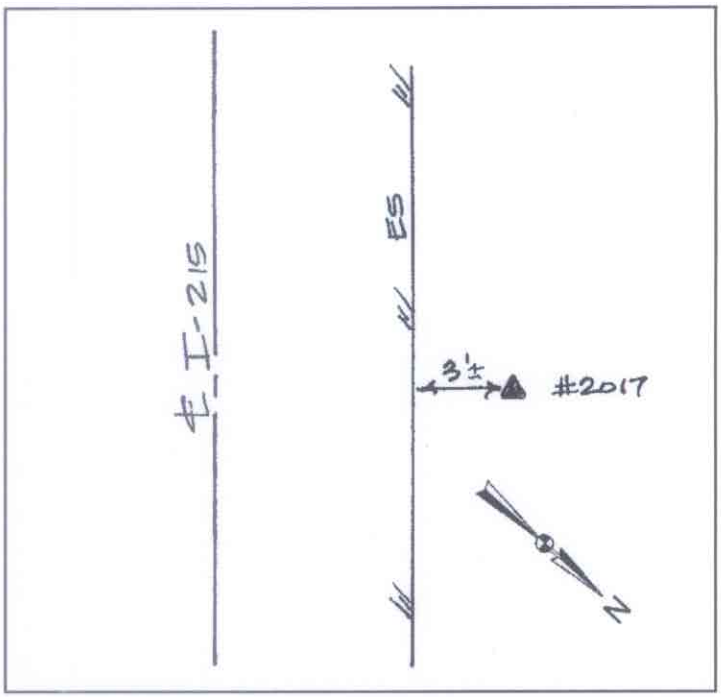
SURVEY CONTROL NETWORK DATA SHEET

Designation: 2017

Stamping: D8-SCN SBD-15 PM 16.7

Date: 08/04/08

Monument Description:
2 ½" Brass Disk in Concrete



CURRENT HORIZONTAL

DATUM: NAD 83 **EPOCH** : NSRS2007 **METHOD**: Fast Static GPS **CCS83 Zone** : 5

Geodetic Coordinates		Degrees	Minutes	Seconds	
Latitude	:	034 °	12 '	59.64333"	N
Longitude	:	117 °	23 '	40.93601"	W

N/E

Northing	:	1901746.149
Easting	:	6744656.847

Ellipsoidal Height : 1889.358 (ft) **Combined Factor (CGF)**: 0.99987495

VERTICAL (orthometric height)

	US Survey Feet	Method	Accuracy	Survey By	Reference
NAVD88:	1994.897	Differential Level	Second Order	AE	N/A

NGVD29:

PREVIOUS HORIZONTAL

EPOCH	METHOD	SURVEY BY	REFERENCE

New monument, no previous reference

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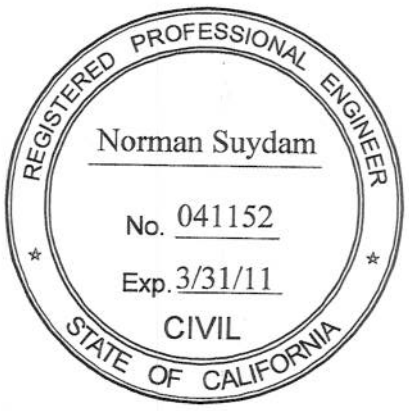
Co: SB Rte: 15 PM: 16.7

EXHIBIT 11-A

Fact Sheet Exceptions to Mandatory Design Standards

08-SBd-15, 215, PM 14.0/R16.4, 16.0/17.8
EA 08-0K7100
I-15/I-215 Interchange
February 2010

Fact Sheet Exceptions to Mandatory Design Standards



Prepared by:

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06/29/10
Date

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6/29/10
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Approved by:
Luis Betancourt
Design Coordinator
HQ Division of Design

7/1/10
Date

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1. PROPOSED PROJECT

1.1. Proposed Project Description

San Bernardino Associated Governments (SANBAG), in cooperation with California Department of Transportation (Caltrans) proposes to reconfigure Interstate 15/Interstate 215 (I-15/I-215) Interchange near Devore (unincorporated area), County of San Bernardino, CA. These sections of highway are access controlled Interstate Freeways adopted by the California Transportation Commission (CTC) in 1969. The purpose of the proposed project is to eliminate congestion, reduce accidents, restore route continuity for I-15, construct truck By-Pass, and improve non-standard weaving between interchanges. Three alternatives were considered ranging from $350 million to $437 million. Project funding is anticipated to be a combination of State, Federal, Local and Measure I funds. The support cost of the PA & ED is estimated to be $3.5 million.

1.2. Existing Highway

Interstate 15 crosses between the San Gabriel and San Bernardino Mountains in an area known as the Cajon Pass. The Cajon Pass area encompasses approximately twelve miles of freeway from Sierra Avenue in Fontana to Oak Hills Road just past the Cajon summit in the Hesperia area.

I-15 is a major south/north route through Riverside and San Bernardino Counties. I-215 branches from I-15 in Temecula in Riverside County just north of San Diego County line. The I-15 proceeds north through the cities of Norco and Corona before entering San Bernardino County through the cities of Ontario, Rancho Cucamonga, Fontana and Rialto. I-215 ultimately reconnects with I-15 in Devore area in San Bernardino County. Separation between I-15 and I-215 corridors is generally about fifteen to twenty miles. I-15 provides one of two south/north links with the National Interstate Network in the Riverside and San Bernardino areas.

Within the project limits, I-15 consists of four mixed flow lanes in each direction from Route 66 to Glen Helen Parkway , three mixed flow lanes in each direction from Glen Helen Parkway to I-215, four mixed flow lanes northerly of the junction with I-215, and one truck climbing lane in the northbound direction only.

Interstate 215 is a major route between Temecula and Devore in Riverside and San Bernardino Counties.. I-215 begins in Temecula following an old alignment of U.S. Route 395 through Riverside County, passing through Riverside and San Bernardino, and ending at the junction with I-15 in Devore. Within the project limits, I-215 consists of two through mixed flow lanes in each direction.

NORTH JUNCTION OF I-15/I-215

This junction is basically a "Y" type of system interchange that was constructed in the late 1960s with the alignment towards San Bernardino being the primary move and the southwesterly leg being the diverging route. Because of this, the design standards for the diverging route are less than mainline standards for an Interstate. Currently, the design speeds for the I-15 southwest leg to the Northwest leg in the NB direction is greater than 80 mph based on the vertical alignment, but is about 69 mph based on the horizontal alignment, while SB direction is 67 mph (vertical) and 69 (horizontal). Therefore, the existing minimum design speeds are less than the desired design standard for an Interstate mainline. The construction of this interchange retained a connection to Devore Road (Glen Helen Parkway) on the I-215 leg which was less than the current standard of a two mile spacing between a system interchange and a service interchange. Along the I-15 alignment, interchanges were made at Kenwood which is slightly less than two miles from the system interchange and a local interchange with Glen Helen Parkway to the south, which also is slightly less than the two mile spacing.

1.3. Safety Improvements

Many of the design elements in the project improve current non standard features, provide additional capacity or make operational improvements that will have an impact to improve safety for the freeway.

The following improvements provided by this project will enhance safety:

- Add truck bypass lanes through the interchange to eliminate difficult auto/truck weaving conflicts.
- Rebuild the I-215/Devore Road Interchange to eliminate non-standard geometric features.
- Reconfigure the existing I-15/Kenwood Avenue interchange to eliminate non-standard geometric features.
- Eliminating the freeway mainline weaving areas: NB I-215 at Devore Road, NB and SB I-15 between I-215 and Kenwood Avenue.

Northbound I-15

- Adding a northbound mainline line between the Glen Helen Parkway off-ramp and the I-215 junction to reduce congestion.
- Adding a northbound auxiliary lane between the Glen Helen Parkway on-ramp and the I-215 junction to improve operation.
- Construct auxiliary lanes to provide for weaving traffic.
- Widen existing Northbound I-15 to Northbound I-15 Connector to add one lane and allow for passing of slower traffic.

Southbound I-15

- Adding a southbound mainline lane between the I-215 junction and the Glen Helen Parkway on-ramp to provide additional capacity.
- Adding a southbound auxiliary lane between the I-215 junction and the southbound Glen Helen Parkway off-ramp to improve operation of the freeway.
- Add auxiliary lanes to provide for merging and diverging traffic.
- Southbound I-15 and I-215 will braid with each other in order to provide route continuity and eliminate a left hand exit ramp.

Northbound I-215

- Construct one additional northbound lane to provide needed capacity.
- Reconfigure the northbound on-ramps at Devore Road to eliminate a loop on-ramp with high accident rate.
- Realign northbound off ramp at Devore Road to make alignment standard.
- Construct Northbound I-215 truck bypass to eliminate auto/truck weaving conflicts.

Southbound I-215

- Reconfigure and add one additional lane to the southbound connector to provide needed capacity.
- Braid the Northbound I-15 to Southbound I-215 connector and the Southbound Devore Road off ramp to eliminate a short weaving area along a CD road.

- Reconstruct southbound off ramp and on ramp approximately 500 feet southerly of the proposed intersection of Glen Helen Parkway with Devore Road to improve geometry.

1.4. Total Project Costs

The total estimated project cost within the project limits consists of (1) construction cost, (2) right-of-way acquisition cost and (3) Support Cost as follows:

(1) Construction Cost:	Alt 3A
Roadway	$187,391,000
Structure	$54,500,000
(2) Right-of-Way Acquisition Cost: (including utility relocation)	$47,937,240
(3) Support Cost: (Permits and Mitigation Expenses)	$24,688,280
Total Project Capital Cost:	**$314,517,000**

2. FEATURES REQUIRING AN EXCEPTION

There are twenty-two locations that require mandatory design exceptions (Refer to Attachment 2, Key Map of sheet locations for Mandatory Design Exceptions).

2.1. Design Exception Feature #1 – Stopping Sight Distance (Vertical Curve)

Nonstandard Features (refer to Attachments 4, & 17):
A short vertical curve is used at Location 1 with Stopping Sight Distance (SSD) less then the required.

Location	Attachment #	Line	From Station	To Station	Provided			Required		
					SSD (ft)	Speed mph	VC Length (ft)	SSD (ft)	Speed mph	VC Length (ft)
1	4 & 17	A3	850+00.00	856+00.00	671	67	600	930	80	1152

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 201.1 - Sight Distance - General
"Table 201.1 shows the standards for stopping sight distance related to design speed, and these shall be the minimum values used in design."

Reasons for Requesting Exception:
Location 1 - The existing southbound I-15 mainline where it crosses over Cajon Creek (4 & 17)
This section of I-15 mainline, where it crosses over Cajon Creek, has been an existing condition for approximate about 40 years with accident rates that are below average (see Table 4 for the southbound mainline accident data, PM 12.500 to 16.373). To make Location 1 standard would involve rebuilding of the existing bridge and rebuilding the roadway on either side of two bridges between Station 850+00.00 and 870.+20.96. A complete

redesign of the vertical realignment would be required. A longer crest vertical curve of 1152 feet will be required for 80 mph design speed which will cause the 600 feet sag vertical curve northerly of the non standard crest vertical curve to be moved about 288 feet northerly causing a new profile grade to be approximately 5 feet higher than the existing roadway and bridge over the C2 line which will have to be replaced To accomplish these changes either a new bridge over Cajon creek would be needed on a lower profile with the longer vertical curve requiring a complete replacement of the structure. Or another option is for the northerly portion of the bridge to have an overlay on the bridge deck holding the BVC at station 850+00 and sliding the VC to the north. It is unsure if the bridge is structurally capable of carrying this concrete overlay considering it will be over 24" thick at the north end of the bridge. This roadway is the 3 SB mainline lanes of I-15. It is not possible to close or reduce the number of these lanes so any new vertical alignments will have to be constructed first on a new horizontal alignment greatly increasing the cost of construction, right of way and environmental impacts. Therefore a longer VC will not work at this location without these replacements in order to increase the provided speed by 13 mph. The provided speed of 67 mph is higher than the posted speed of 70 mph for this facility. It is not reasonable to rebuild the bridge and portion of the roadway where the actual accident rates (see Table 4) are lower than the average for a similar roadway facilities.

Added Cost to Make Standard:
Location 1 - The cost to make standard is estimated at $11.25 million which includes the cost of the roadway which is $1.5 million and the cost of the structures is $9.75 million. These additional costs represent 4.7 % of the total project construction cost.

2.2. Design Exception Feature #2 – Horizontal Alignment (Minimum Radius)

Nonstandard Features (refer to Attachments 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14 &15):

Location #	Attachment #	Line	Location Description	BC Station	EC Station	Radius (ft)	Standard Radius (ft)
1	3, 13	CD	Off-Ramp	925+26.89	934+42.28	757	850
2	4, 6, 7	A3	SB I-15	850+12.23	871+04.70	2012	3900
3	5, 8, 9	A2	NB I-15	857+09.70	882+40.57	2000	3900
4	5, 6, 14, 15	C2	Connector	856+42.14	872+73.31	650	850
5	9	A2	NB I-15	886+01.19	890+83.74	2000	3900
6	9	A2	NB I-15	890+83.74	892+50.82	3000	3900
7	11, 12	B1	I-215 Mainline	904+29.17	915+20.43	2999	3900

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 203.2 - Standards for Curvature
" Table 203.2 shall be the minimum radius of curve for specific design speeds."

Reasons for Requesting Exception:
Many of the locations where an exception has been requested, has a curve radius less than 3900 feet or 850 feet for mainlines and connector ramps respectively. The request for these design exceptions is primarily to reduce impact to the surrounding community, right of way acquisition and environmental habitat; and cost. A number of the existing alignments have a history of accident rates that are lower than the statewide average for a similar section of highway. Some of the new alignments, which are non-standard, are the result of other geometric constraints in this area that result in these exceptions.

Location 1 – CD line, Northbound I-15 off ramp to Devore Road (3 &13)
The C1 line has an 850 foot radius. The CD line off-ramp has an 850 foot radius, compounds to a 757 foot radius immediately after the exit nose which is 93 feet less than the required 850 foot radius. This is required to permit the merge with the D3 line. The design speed of this particular radius is 47 mph which slightly less than 50 mph but is consistent with the crest vertical curve design speed noted in Design Feature Number 1. To achieve standard design, a considerable amount of additional bridge and roadway construction and right of way acquisition impacts on environmental habitat would be required. Making Line CD standard would require that the diverge from the I-15, at both Line CD and Line C1, be relocated further south. Since the Line CD diverge requires a distance of 600 feet between successive exits, increasing the horizontal curve radius for Line CD requires that Line C1 be moved further south. This would require a widening of about 35 feet of the Cajon Creek Bridge and a widening of about 12 feet of the railroad bridge located further south. Additionally, this would extend out the right of way acquisition approximately 40 to 50 feet impacting Cajon Creek, Glen Helen Park, San Bernardino Kangaroo Rat habitat and private properties.

Location 2 – A3 line, Southbound I-15 mainline (4, 6 & 7)
This is an existing alignment that was the south to west connector and was converted to be the SB I-15 mainline. About 25% of this alignment is on the bridge and possess common reasons for requesting exceptions. The actual accident rates in this area (PM 14.048) are lower than the statewide average for similar sections of highway. There will be a substantial cost savings by keeping the existing roadway opposed to a completely new alignment on a larger radius. This particular roadway would present the largest impact to the Cajon Creek right of way and habitat areas. Currently the radius is 2012 feet, however, if the full standard 3900 ft radius were constructed, the centroid of the curve would move approximately 300 feet further into the streambed, requiring additional embankment, bridge, right of way acquisition and environmental impacts. To make Line A3 (Location 2) standard, the pavement along SB I-15 would need to be realigned in addition to replacing Cajon Creek Bridge Left. The W-S Connector merge must be moved further south with a new separate bridge and Devore Overhead Left widen outside for the lane merge of the W-S Connector. It would be impractical to spend $47 million to improve this curve and impact the Creek where there is no accident issues.

Location 3 – A2 line, Northbound I-15 roadway (5, 8 & 9)
This is an existing alignment that was the east to north connector and was converted to be the NB I-15 mainline. This particular alignment is being widened in order to utilize the existing pavement and more importantly the bridge structure that spans over the B2, B3 and C2 alignments. The accident data for this particular roadway (PM 14.273) is substantially below the average accident rate for this type of facility. For this location, realigning Line A2 involves new pavement along I-15 NB, replacing Cajon Creek Bridge Right and Route 215/15 Separation Bridge. Additionally, I-15 SB will have to be realigned also involving new pavement, and replacing Cajon Creek Bridge Left. Small portions of the W-S Connector will also be realigned with a new bridge. The Devore Overhead Left will need an additional lane to accommodate the W-S Connector merge. It would be impractical to spend $97 million to improve this area by replacing bridges and impact other areas where there is no accident issues.

Location 4 – C2 Line, North I-215 to south I-15 Connector (5, 6, 14 & 15)
This particular roadway is the lowest of the three levels of this interchange. Reconstruction of this connector to facilitate a larger radius would result in a complete reconstruction of all the bridges and roadways in this interchange. The actual accident (F+I) rate of 0.29 for this connector (PM 17.489) is slightly higher than the statewide average of 0.26. However, the total actual accident rate is much lower (0.49 versus 0.80) for similar sections of highway. Keeping this particular connector in its current location would result in substantial reduction of right of way and environmental impacts. In order to make Line C2 (Location 4) standard it requires realignment under existing roads, new pavement and new multiple structures. The structures requiring

replacement include Cajon Creek Left Bridge, Center Connector Bridge, West Connector Bridge, and widening on Devore Overhead Left.

Locations 5 and 6 – Line A2, Northbound I-15 roadway (9)
This is a continuation of the existing alignment identified as location 3. This is the existing concrete pavement for the northbound I-15 mainline and we are proposing to keep the existing automobile traffic on this roadway and move truck traffic to a bypass. The first curve has a 2000 foot radius which equivalent to 69 mph and the second curve has a 3000 foot radius which equivalent to 75 mph where the posted maximum speed limit is 70 mph and the standard design speed is 80 mph for a standard radius of 3900 feet. The actual accident rates in this area (PM 14.273) are lower than the statewide average for similar sections of highway. For Locations 5 & 6, to make the curves standard would shift the T1, T3, A2 lines and Nedlee Street northerly. Also, there would be a northerly shift of the merge point of the A2 & B2 Lines to make the 3900 foot curve acceptable. This would shorten the merge distance to the Kenwood undercrossing which can only accommodate 5 lanes. To accommodate the new realignments, additional right of way acquisition increase of the retaining wall size, and a new roadway section would be required for the A2 line through the revised radius and it's superelevation transitions.

Location 7 – B1 line, I-215 freeway mainline (11 & 12)
This is an existing roadway where the centerline radius is less than 3900 feet. The radius of 3000 feet has existed since the freeway was constructed in the late 1950's. The existing design and comfort speed is 75 mph this condition is 5 mph over the posted speed and 5 mph less than the proposed design speed of 80 mph. We propose to widen the freeway about the existing centerline to minimize impacts to motorists, adjacent properties and environmental areas. Symmetrical widening about the existing roadway will also facilitate easier construction staging. The accident rate along this section of I-215 in the northbound direction is below the average; however, the southbound accident rate is slightly above. The actual total southbound accident rate is 0.99 when compared against 0.90 for the statewide average. We do not believe that the radius of this curve contributes to the accident rate of this facility. The southbound direction could drive its accident rate from the lack of route continuity as well as the downhill speed of vehicles traveling from Cajon Pass. This alternative will provide route continuity for the SB I-15 traffic which should lower the accidents associated with the current 3 lane changes needed to stay on I-15. To make Line B1 (Location 7) standard, the affects would be considerable for an increase of 5 mph. The Centerline radius could be revised two ways. First, if the incoming and outgoing tangents remain at their current position, the 3900 foot radius would shift the roadway to the southwest. The centroid of the curve would move about 15 feet southwest. Both northbound and southbound mainline would have to be reconstructed. This would impact the adjacent proposed connector and ramp horizontally by extending them further south, thus requiring additional right of way acquisition as well as lengthening the span of the proposed Devore Overcrossing. This could increase the depth of structure and therefore causing the Devore OC vertical alignment to be non-standard. The connector and ramps vertical alignment would also be affected. The C1 connector would need to be lowered in order to be in the same superelevation plane of the widened freeway, thus making it's vertical alignment non-standard. Second, the 3900 foot radius could be shifted where the centerline crosses the existing centerline at the center bent of the proposed bridge. This would lessen the effects of the widening to the southwest. However, there will be some widening to the southwest and some to the northeast, northerly of the bridge, therefore, resulting in more right of way acquisition/ takes. Also, new roadway sections would be required due to the change in supertransitions and alignment shifts.

Added Cost to Make Standard:
Location 1 – The cost to make standard is estimated at $1.7 million which includes a bridge modification. These additional costs represent 0.7 % of the total project construction cost.

Location 2 – The cost to make standard is estimated at $47 million which includes the cost for new pavement along southbound I-15 and the replacement of the existing Cajon Creek overhead right bridge. These additional costs represent 19.4 % of the total project construction cost.

Location 3 – The cost to make standard is estimated at $97 million which includes the cost for new pavement along I-15 northbound, replacing Cajon Creek Right Bridge and Route 215/15 Separation Bridge. This will also include additional costs to realign I-15 southbound, replace the Cajon Creek Left Bridge, W-S Connector and the Devore Overhead Left Bridge. These additional costs represent 40.1 % of the total project construction cost.

Location 4 – The cost to make standard is estimated at $29.4 million which includes the cost of realignment under existing roads, new pavement, new Cajon Creek Left Bridge, Center Connector Bridge, West Connector Bridge, and widening on Devore Overhead Left Bridge. These additional costs represent 12.2 % of the total project construction cost.

Location 5 and 6 – The cost to make standard is estimated at $1.7 million which includes the cost of right of way acquisition for both location 5 and 6. These additional costs represent 0.7 % of the total project construction cost.

Location 7 – The cost to make standard is estimated at $1.2 million which includes the cost of realignment and the addition of 1 lane in both the northbound and southbound directions of I-215 at this location. These additional costs represent 0.5 % of the total project construction cost.

2.3. Design Exception Feature #3 – Stopping Sight Distance (Horizontal Curve and Obstructions)

Nonstandard Features (refer to Attachments 3, 4, 5, 6, 12, 13 & 14):

Location	Attachment #	Line	Location Station	Provided		Required	
				Speed (mph)	SSD (ft)	Speed (mph	SSD (ft)
1	5	C2	865+30	40	301	50	430
2	13	C1	925+00	42	327	50	430
3	3	CD	933+71 to 936+78	40.2	302	50	430
4	4	A3	851+77 to 856+91	55	501	80	930
5	6	A3	858+07 to 863+15	55	501	80	930
6	5	A2	860+29 to 865+34	55.4	506	80	930
7	5, 14	B3	928+52 to 935+74	68.8	723	80	930
8	12	B1	904+29 to 915+20	77	883	80	930
9	4	C2	848+82 to 852+17	43	331	50	430

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 203.1 - General
"Horizontal alignment shall provide at least the minimum stopping sight distance for the chosen design speed at all points on the highway, as given in Table 201.1 and explained in Index 201.3."

Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 309.1(1)
" Horizontal clearances greater than those cited below under subsection (3) – 'Minimum Clearances' shall be provided where necessary to meet horizontal stopping sight distance requirements."

Reasons for Requesting Exception:
This particular feature deals with restrictions to stopping sight distance that would result in a design speed that would be less than presented for that particular facility. There are two different roadways involved in this feature: The C2 line which is also an existing freeway to freeway connector with a 50 mph design speed and the C1 line which is a freeway to freeway connector with a 50 mph design speed.

Location 1 – C2 Line, North I-215 to south I-15 connector (5)
The existing C2 connector is the lowest level of this three level interchange. The roadway is in a depressed section with cut slopes on both the left and right sides. The sight obstructions come from a partial obstruction due to a bridge column. The bridge column effectively reduces the stopping sight distance at a spot location at Station 865+30. The connector stopping sight distance of 301 feet provides a speed of 40 mph, which is very similar to the connector's design speed of 43 mph due to it's 650 foot radius. The actual accident (F+I) rate of 0.29 for this connector (PM 17.489) is slightly higher than the statewide average of 0.26. However, the total actual accident rate is much lower (0.49 versus 0.80) for similar sections of highway. A cut slope on the left side of the connector had restricted SSD to 43 mph. However, a retaining wall is proposed to be placed at 24 feet from the edge of the shoulder which will meet the standard SSD. The single column obstruction, the stopping sight distance (SSD) will never meet the standard for 50 mph design speed. As noted in the Advisory Design Feature #3, the horizontal and vertical alignments are being retained in an effort to minimize impacts to right of way and environmental areas adjacent to the freeway. To make standard, the Separation Bridge (No. 54-783) will need to replaced.

Location 2 – Along C1 line, North I-15 to south I-215 connector (13)
The sight restriction is located at the braided ramp bridge structures safety shaped railing as it passes over the D3 line . In this particular area the stopping sight distance provides a speed of 42 mph for only 160 feet along the bridge railing. The design speed of a connector is 50 mph. As mentioned on design exception feature number 1 at, this location an attempt was made to balance the design speeds for the various braided and dependant roadways to achieve a design which was mutually acceptable . With Lines C1, D3, and CD affecting each other, making the C1 Line SSD standard would cause other alignments to become non-standard. In order to make the 430' SSD standard, the inside shoulder would need to be widened over 11 feet. However, the required minimum clearance (16.5 feet) of the C1 bridge over the D3 Line would then be non-standard. If the vertical alignments for both Lines C1 and D3 were adjusted for the bridge clearance, they would also become non-standard. If C1 was shifted to the outside, the vertical alignment would exceed 6% and become non-standard. If the non-standard 6% is accepted, then the horizontal alignment would need to extend farther south so the crest vertical curve would remain standard.

Location 3 – Along CD line, Northbound I-15 off ramp to Devore Road (3)
The sight restriction is located at the ramp bridge structure railing as it passes over the Cajon Boulevard. In this particular area the stopping sight distance is 302 feet provides a speed of 40 mph for about 170 feet of bridge railing which less than the design speed of 50 mph. In order to make the 420 foot SSD standard, the bridge railing will have to be tapered to a maximum of about 14 feet to the outside. This would only make the stopping sight distance standard not accounting for curves design speed. To make the curve standard, see design exception feature 2 above. Taillight will not be visible within this particular area due to the bridge railing.

Location 4 - A3 line, Southbound I-15 mainline (4)
The sight restriction, to this existing alignment, is located at the approach to the Cajon Creek Bridge Left (No. 781 L). In this particular area the stopping sight distance is 501 feet provides a speed of 55 mph for about 330 feet of bridge railing which less than the design speed of 80 mph. In order to make the 930 foot SSD standard, the roadway and existing bridge will have to be widened up to about 40'. To achieve standard sight distance, a considerable amount of additional bridge and roadway construction would be required. Also, this particular

roadway would present the largest impact to the Cajon Creek habitat areas. Taillight will not be visible within this particular area due to the bridge railing.

Location 5 - A3 line, Southbound I-15 mainline (6)
This is a continuation of the existing A3 line at Location 4. The sight restriction is located at the West Connector Undercrossing Bridge (No. 54-782). In this particular area the stopping sight distance is 501 feet provides a speed of 55 mph for about 130 feet of bridge railing which less than the design speed of 80 mph. In order to make the 930 foot SSD standard, the roadway and existing bridge will have to be widened up to 30 feet on the right shoulder. Taillight will be visible to traffic within this particular bridge area .

Location 6 - A2 line, Northbound I-15 mainline (5)
The sight restriction, to this existing alignment, is located at the approach to the I-15/I-215 Separation Bridge (No. 54-783). In this particular area the stopping sight distance is 506 feet provides a speed of 55.4 mph for about 260 feet of bridge railing which less than the design speed of 80 mph. In order to make the 930 foot SSD standard, the roadway and existing bridge will have to be widened up to 29 feet on the left shoulder. The existing 5 foot shoulder will be improved to 10 foot shoulder with this project. As mentioned on design exception number 2, this particular alignment is being widened in order to utilize the existing pavement and more importantly the bridge structure that spans over the B2, B3 and C2 alignments substantial savings in cost will be noted by this alignment. For this location, realigning Line A2 involves new pavement along I-15 NB and widening Route 215/15 Separation Bridge. Taillight will be visible to traffic within this particular bridge area .

Location 7 - B3 line, Southbound I-215 mainline (5 & 14)
The sight restriction, to this existing alignment, is located along the I-215 mainline just south of Route I-15/I-215 Separation Bridge. In this particular area the stopping sight distance is 723 feet provides a speed of 68.5 mph which less than the design speed of 80 mph. In order to make the 930 foot SSD standard, the roadway alignment will need to shift about 12 feet on the right shoulder. This restriction due to the median barrier is about 712 feet long south of Route I-15/I-215 Separation Bridge. The realignment would require the modification the bridge over the C2 connector as well as the separation bridge above. However, this widening would not be structurally feasible or consistent with ultimate project since a second widening would be needed for the ultimate lane configuration (1 HOV + 3 lanes). Taillight will be visible to traffic within this particular median area .

Location 8 - B1 line, Northbound I-215 mainline (11 & 12)
The restriction, to this existing alignment, is located along the I-215 mainline just south of the Devore Road overcrossing bridge. In this particular area the stopping sight distance is 883 feet, due to the concrete barrier, provides a speed of 77 mph which 3 mph less than the design speed of 80 mph, SSD of 930 feet, but 7 mph over the posted speed for a restriction of 1,091 feet long. As mentioned on design feature number 2, this is an existing roadway where the centerline radius is less than 3900 feet. The radius of 3000 feet has existed since the freeway was constructed in the late 1950's. The existing design and comfort speed is 75 mph which is 5 mph over the posted speed and 5 mph less than the proposed design speed of 80 mph. We propose to widen the freeway about the existing centerline to minimize impacts to motorists, adjacent properties and environmental areas. Symmetrical widening about the existing roadway will also facilitate easier construction staging. The accident rate along this section of I-215 in the northbound direction is below the average, however, the southbound accident rate is slightly above. A 3900 foot radius could be shifted where the centerline crosses the existing centerline at the center bent of the proposed bridge. This would lessen the effects of the widening to the southwest. However, there will be some widening to the southwest and some to the northeast, northerly of the bridge, therefore, resulting in more right of way acquisition/ takes. Also, new roadway sections would be required due to the change in supertransitions and alignment shifts. Taillight will be visible to traffic within this particular median area.

Location 9 - C2 line, North I-215 to south I-15 connector (4)
The sight restriction, to this existing alignment, is located just north of the merge with the I-15 southbound on the existing bridge over the Cajon Creek. In this particular area the connector stopping sight distance is 331 feet that provides a speed of 43 mph which less than the design speed of 50 mph. In order to make the 420 foot SSD standard, the existing bridge will need to be widened up to 17 feet. Also, this particular roadway would have an impact to the Cajon Creek habitat area.

Added Cost to Make Standard:
For Location 1, the cost to make standard includes the cost of replacing Separation Bridge (No. 54-783) and roadway for A2 Line at an estimated cost of $7,000,000. These additional costs represent 2.9 % of the total project construction cost.

For Location 2, to increase the stopping sight distance from 327 feet to 430 feet, and a grade of greater than 6% is accepted, the horizontal alignment would need to extend farther south and therefore additional roadway and a wider bridge structure would result in a $1,700,000 cost. These additional costs represent 0.7 % of the total project construction cost.

For Location 3, to increase the stopping sight distance from 302 feet to 430 feet, the added cost of the bridge widening is estimated at $1,300,000 which represent 0.5 % of the total project construction cost.

For Location 4, to increase the stopping sight distance from 501 feet to 930 feet, the of the roadway and bridge widening cost is estimated at $3,500,000 which represent 1.4 % of the total project construction cost.

For Location 5, to increase the stopping sight distance from 501 feet to 930 feet, the of the roadway and bridge widening cost is estimated at $1,700,000 which represent 0.7 % of the total project construction cost.

For Location 6, to increase the stopping sight distance from 506 feet to 930 feet, the roadway and existing bridge will have to be widened up to 29 feet on the left shoulder. The added cost to make standard is estimated at $2,500,000 which represent 1.0 % of the total project construction cost.

For Location 7, to increase the stopping sight distance from 723 feet to the standard 930 feet, the added cost of the widening and bridge modifications is estimated at $2,700,000 which represent 1.1 % of the total project construction cost.

For Location 8, to increase the stopping sight distance from 883 feet to 930 feet, the I-215 freeway mainline will need to be realigned and additional 1 lane in both the northbound and southbound directions of I-215 at this location will also be needed. The added cost to make standard is estimated at $1,200,000 which represent 0.5 % of the total project construction cost.

For Location 9, to increase the stopping sight distance from 331 feet to 430 feet, the existing bridge will need to be widened up to 17 feet. The added cost to make the SSD standard is estimated at $1,900,000 which represent 0.8 % of the total project construction cost.

2.4. Design Exception Feature #4 – Minimum Horizontal Clearance to Objects and Shoulder Width

Nonstandard Features (refer to Attachment 5):

On Lines B2 and B3, from about 937+00 to 937+40, the horizontal clearance will be about 7 feet to the proposed Type 60E PCC barrier. The required horizontal clearance is 10 feet to all objects from the edge of travel way.

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 309.1(3)(a) - Horizontal Minimum Clearance
"The minimum horizontal clearance to all objects, such as bridge rails and safety-shaped concrete barriers, as well as sand-filled barrels, metal beam guardrail, etc., on all freeway and expressway facilities, including auxiliary lanes, ramps, and collector roads, shall be equal to the standard shoulder width of the highway facility as stated in Table 302.1. A minimum clearance of 4 feet shall be provided where the standard shoulder width is less than 4 feet."

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 302.1 - Shoulder Width
"The shoulder widths given in Table 302.1 shall be the minimum continuous usable width of paved shoulder.
Reasons for Requesting Exception:
The construction of the interchange originally built the existing B2 and B3 alignments as the mainline freeway traveling toward San Bernardino. The bridge at this location spans over the C2 connector and was designed to accommodate three northbound lanes and three southbound lanes with standard 10 foot shoulders on the outside and a 22 foot median in separating the two roadways. This would provide for 10 feet shoulders and two feet for median barrier. The intent of this particular alternative was to utilize the existing bridge for the northbound and southbound connectors. The exception is created by another existing bridge above the B2 and B3 alignment which is the A2 Line or northbound I-15 freeway. This creates a situation where the column of the A2 bridge passes through the deck of the B2 and B3 bridges. The A2 bridge has 5 foot wide columns extending down between the B2 and B3 alignments, thus creating shoulder widths of about 7 feet on the inside of each roadway at the column. It is not uncommon to have columns in the median providing a brief or temporary reduction in the median width. The B2/B3 alignments are designed for future widening to the outside to accommodate a fourth lane in each direction. This widening will be reserved for a future HOV direct connector to the I-15 HOV or Managed lanes. At that time it may be possible to construct the added 2 feet to make the left shoulder 10 feet wide. Therefore, it is impractical to widen the B2 and B3 alignment to obtain a standard median because that would require the B2 and B3 Bridges to be widened by two feet to the outside.

Added Cost to Make Standard:
For Line B2, the cost to make standard is estimated at $2.1 million which includes the costs to increase median width, realignment through the existing Center Connector Bridge with outside widening on the bridge and along the pavement.

For Line B3, the cost to make standard is estimated at $2.2 million which includes the costs of increasing the median width that requires realignment through the existing Center Connector Bridge with outside widening on the bridge along the pavement, and a retaining wall. Widening a bridge by 2 feet is highly expensive and may require a minimum width of 10 feet to be structurally sound.

These additional costs represent 1.8 % of the total project construction cost.

2.5. Design Exception Feature #5 – Interchange Design Standards

Nonstandard Features (refer to Attachments 9 & 10):

Along the existing "B2" Line, 962+00 to 968+00, freeway entrance connects with through traffic on the left (See attachments 18 & 20). The requirements are that connections shall be to the right of through traffic

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 504.2(1) - Freeway Entrances and Exits
"All freeway entrances and exits, except for direct connections with median High-Occupancy Vehicle (HOV) lanes, shall connect to the right of through traffic."

Reasons for Requesting Exception:
All on and off ramps should join the mainline from the right hand side. The northbound I-215, which was the original mainline, joins the I-15 mainline on the left hand side. This particular design is a propagation of the existing roadway configuration. The I-215 transition to the number 1, 2 and 3 lanes and the I-15 merges on the right hand side forming lanes 4, 5 and 6. Over the next half mile, one lane is reduced keeping a five lane configuration to the north. It is proposed to keep this configuration to save on cost, and impacts to adjacent lands. The primary reason that this existing configuration, 2 lanes on I-215 merging with 3 lanes from I-15, does not currently work, is that there are slow moving trucks along with the automobiles in the I-215 connector which must weave across I-15 traffic to reach the slow lane. This section of the I-15 is on a 4% uphill grade causing trucks to slow considerably. With our proposed design, a northbound truck by-pass will remove all trucks and slow vehicles from the northbound I-215 connector and merge on the right hand side further north, creating a standard merge configuration for the slower vehicles. Keeping this configuration will allow us to maintain the B2 and the A2 alignments saving substantial cost and impacts to the surrounding community.

The northbound I-215 B2 alignment and the northbound A2 alignment have a total accident rate below the total average. The current accident rate northerly of where these two roadways join is above the average for a similar facility. The northbound accident rate between the merge and Kenwood Avenue is 0.79 compared to an average of 0.65. A substantial number of these accidents involve slow moving trucks whose accident rate is double the average for a freeway. It is believed that by providing the northbound truck bypass in this area, the accident rate will be reduced closer to the average.

Added Cost to Make Standard:
To make Line B2 standard requires a merge swap with Line A2 and will effect all other structures, ramps, and connectors near the interchange, as a result an interchange reconfiguration is needed along the I-15 northbound section. A graphic representation of this alignment is proposed in alternative 3. The NB I-15 is realigned in the 'median' of the NB freeway, and a longer NB I-15 truck bypass is needed with a new bridge over the B2/B3 alignments. The B2/B3 alignment is moved further to the east requiring a new bridge over the C-2 connector. The NB I-15 mainline over Cajon Creek would be revised requiring that structure to be replaced. The cost to make standard is $35 million. These additional costs represent 14.5 % of the total project construction cost.

2.6. Design Exception Feature #6 – Interchange Spacing

Nonstandard Features (refer to Attachment 16):

#	Location	Existing Spacing (Miles)	Standard Spacing (Miles)
1	Between I-15/I-215 Interchange and Glen Helen Pkwy Interchange	1.6	2.0
2	Between I-15/I-215 Interchange and Glen Helen/Devore Rd Interchange	0.5	2.0
3	Between I-15/I-215 Interchange and Kenwood Ave Interchange	1.2	2.0

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 501.3 – Spacing
"The minimum interchange spacing shall be one mile in urban areas, two miles in rural areas, and two miles between freeway-to-freeway interchanges and local street interchanges"

Design Information Bulletin Number 77 – Interchange Spacing requirements provides added guidance on how the interchange spacing is implemented with specific 'weaving' distances between on and off ramps.

"The minimum spacing between interchanges shall be 1.0 mile in urban areas, 2.0 miles in rural areas, and 2.0 miles between freeway-to-freeway interchanges and local street interchanges". It should be noted that DIB 77 is still showing Metric units of measure which we have converted into English distances for the weaving standards. The 1 and 2 mile spacing distances will be used per the 6th edition of the HDM.

PHYSICAL FEATURE	REQUIRED SPACING	
	1.0 mile *	2.0 miles *
Minimum weaving length as defined in DIB 77	1,969 feet *	4,921 feet *
Minimum distance between centerline of adjacent intersecting roadways	1.0 mile *	2.0 miles *
* See DIB 77 for Metric Unites		

Reasons for Requesting Exception:
At location 1, the maximum distance available is 1.6 miles spacing between the I-15/I-215 Interchange and Glen Helen Pkwy Interchange. The Glen Helen Interchange will be maintained at its location primarily to serve mainly the Glen Helen Regional Park and Pavilion facility and Rosena Ranch. Relocating this interchange to provide a standard two mile spacing will have significant impact on the existing San Bernardino National Forest area, adjacent development, riparian areas and require additional right of way. This interchange, which was constructed about 15 years ago, is located where a local arterial street crossed under the freeway. The I-15 northbound Connector to I-215 southbound will operate at LOS B or better with the proposed configuration. The I-15 mainline segment will operate at LOS D and C or better in the northbound and southbound direction respectively. The provided weaving lengths between the ramp influence areas of these two interchanges are approximately 4,770 feet and 4,915 feet along the northbound and southbound respectively. Therefore, these weaving lengths are only 151 feet and 6 feet short of the standard 4921 feet, respectively.

At location 2, the Devore Road Interchange is proposed to have an approximate spacing of 0.7 miles to the I-15/I-215 Interchange. The proposed Interchange will need to serve the Devore community north of I-15/I-215 area and businesses and community located at the southeast quadrant of the Devore Interchange. If the two mile spacing were implemented, the relocated interchange will be positioned in an area dominated by a flood plane and prime SBKR habitat. This segment of the I-215 mainline will operate at LOS D or better in the northbound and southbound directions.

The I-215 southbound off- ramp to Devore Road will operate at LOS C or better and the I-215 northbound on ramp from Devore Road will operate at LOS B or better with project conditions.

At location 3, the maximum distance available is a 1.2 mile spacing between the I-15/I-215 Interchange and Kenwood Ave Interchange. The Kenwood Avenue Interchange will be kept at its location to serve mainly the Devore community located northeast of I-15. This interchange currently serves as one of only two access points

to Cajon Blvd to the west. At the 2 mile location, the freeway resides on the mountainside making an interchange impractical. This segment of the I-15 mainline will operate at LOS D or better in the northbound and southbound directions with the proposed configuration. Also, there will be no weaving area along this segment of the freeway. The provided weaving distance along the truck bypass/collector distributor, between the northbound I-215 truck bypass and off ramp to Kenwood Avenue, is approximately 1,845 feet which operate at LOS C or better with the proposed configuration.

Added Cost to Make Standard:
At location 1, the added cost to make it standard is estimated at $35 million for additional roadway and bridge construction, embankments, right of way and additional environmental mitigation costs. These additional costs represent 14.5 % of the total project construction cost.

At location 2, the added cost to make it standard is estimated $35 million for additional roadway and bridges construction, embankments, right of way and added environmental mitigation costs. These additional costs represent 14.5 % of the total project construction cost.

At locations 3, the added cost to make it standard is estimated at $35 million for additional roadway and bridge construction, embankments, right of way and additional environmental mitigation costs. These additional costs represent 14.5 % of the total project construction cost.

3. TRAFFIC DATA

A Traffic Operation Analysis was performed to study the existing traffic conditions (Year 2007), forecast future traffic demand (Year 2040) and assess the impact on traffic conditions of the proposed improvements. Detailed methodologies and analysis results can be referenced in the draft Traffic Operations Analysis report dated December 18, 2009.

The current and projected Average Daily Traffic volumes for this project are shown in Table 1:

Table 1: Freeway Mainline Peak Hour Demand Comparison

Freeway Segment	ADT		
	2007	2017	2040
I-15 Northbound			
Sierra Ave On Ramp to Glen Helen Pkwy Off Ramp	55,500	81,200	140,400
Glen Helen Pkwy On Ramp to I-215 SB Connector	53,600	78,200	134,600
I-215 SB Connector	8,800	10,000	12,600
I-215 SB Connector to I-215 NB Connector	44,800	68,200	122,000
I-215 NB Connector to Kenwood Ave Off Ramp	66,100	103,000	188,000
Kenwood Ave On Ramp to North of Kenwood Ave	64,900	103,000	190,700
I-15 Southbound			
North of Kenwood Ave to Kenwood Ave On Ramp	70,400	106,000	187,900
Kenwood Ave On Ramp to I-215 SB Connector	71,600	107,800	191,100

I-215 SB Connector to I-215 NB Connector	50,400	73,200	125,600
I-215 NB Connector to Glen Helen Pkwy Off Ramp	59,200	82,600	136,400
Glen Helen Pkwy On Ramp to Sierra Ave Off Ramp	58,100	83,800	143,000
I-215 Northbound			
University Pkwy On Ramp to Palm Avenue	29,600	44,000	77,000
Palm Ave On Ramp to Devore Rd Off Ramp	28,400	43,400	78,000
I-15 SB Connector	8,800	9,400	10,800
I-15 NB Connector	21,300	34,800	65,900
I-215 Southbound			
Connector from I-15 SB	21,300	34,700	65,400
CD On Ramp to Palm Ave Off Ramp	31,400	46,200	80,400
Palm Ave On Ramp to University Pkwy Off Ramp	30,100	45,000	79,100

Table 2 shows the projected (Year 2040) AM and PM peak hour traffic volumes and percent of trucks for the I-15 freeway mainline between the adjacent interchanges and the ramps.

Table 2: Year 2040 I-15 Mainline and Ramp Peak Hours Volumes

Freeway Segment	2040			
	AM		PM	
	Volume vph	Trucks %	Volume vph	Trucks %
I-15 Northbound				
Sierra Ave On Ramp to Glen Helen Pkwy Off Ramp	5,898	12%	8,862	13%
Glen Helen Pkwy Off Ramp	194	7%	473	5%
Glen Helen Pkwy Off Ramp to Glen Helen Pkwy On Ramp	5,704	12%	8,392	14%
Glen Helen Pkwy On Ramp	104	1%	488	6%
Glen Helen Pkwy On Ramp to I-215 NB Connector	5,808	12%	8,880	13%
I-215 SB Connector	820	3%	793	7%
I-215 SB Connector to I-215 NB Connector	4,988	14%	8,086	14%
I-215 NB Connector	2,943	10%	5,490	5%
I-215 NB Connector to Kenwood Ave Off Ramp	7,931	12%	13,576	10%
Kenwood Ave Off Ramp	79	23%	309	7%
Kenwood Ave Off Ramp to Kenwood Ave On Ramp	7,851	12%	13,267	10%
Kenwood Ave On Ramp	20	30%	794	6%
Kenwood Ave On Ramp to North of Kenwood Ave	7,871	12%	14,061	10%
I-15 Southbound				

North of Kenwood Ave to Kenwood Ave On Ramp	14,452	9%	11,119	11%
Kenwood Ave Off Ramp	584	14%	11	27%
Kenwood Ave Off Ramp to Kenwood Ave On Ramp	13,869	8%	11,108	11%
Kenwood Ave On Ramp	210	6%	90	10%
Kenwood Ave On Ramp to I-215 SB Connector	14,079	8%	11,198	11%
I-215 SB Connector to I-215 NB Connector	8,385	12%	7,099	14%
I-215 NB Connector	657	9%	695	4%
I-215 NB Connector to Glen Helen Pkwy Off Ramp	9,042	11%	7,794	13%
Glen Helen Pkwy Off Ramp	152	14%	64	6%
Glen Helen Pkwy Off Ramp to Glen Helen Pkwy On Ramp	8,890	11%	7,730	13%
Glen Helen Pkwy On Ramp	535	7%	190	13%
Glen Helen Pkwy On Ramp to Sierra Ave Off Ramp	9,424	11%	7,920	13%

Table 3 shows the projected (Year 2040) AM and PM peak hour traffic volumes and percent of trucks for the I-215 freeway mainline between the adjacent interchanges and the ramps.

Table 3: Year 2040 I-215 Mainline and Ramp Peak Hours Volumes

Freeway Segment	2040			
	AM		PM	
	Volume vph	Trucks %	Volume vph	Trucks %
I-215 Northbound				
University Pkwy On Ramp to Palm Ave Off Ramp	3,711	9%	6,713	5%
Palm Ave Off Ramp	871	3%	1,143	1%
Palm Ave Off Ramp to Palm Ave On Ramp	2,840	11%	5,571	6%
Palm Ave On Ramp	453	3%	613	2%
Palm Ave On Ramp to Devore Rd Off Ramp	3,293	10%	6,184	5%
Palm Ave Off Ramp	150	5%	235	13%
Palm Ave Off Ramp to Devore Rd On Ramp	3,143	10%	5,949	5%
Palm Ave On Ramp	457	10%	236	3%
Palm Ave On Ramp to I-15 SB Connector	3,600	10%	6,185	5%
I-15 SB Connector	657	9%	695	4%
I-15 NB Connector	2,943	10%	5,490	5%
I-215 Southbound				
I-215 Connector from I-15 SB	5,694	4%	4,101	6%
CD Off Ramp	158	5%	85	6%

CD Off Ramp to CD On Ramp	5,536	3%	4,016	6%
CD On Ramp	935	5%	447	3%
CD On Ramp to Palm Ave Off Ramp	6,471	4%	4,462	6%
Palm Ave Off Ramp	784	2%	275	6%
Palm Ave Off Ramp to Palm Ave On Ramp	5,688	4%	4,187	6%
Palm Ave On Ramp	1,061	2%	963	2%
Palm Ave On Ramp to University Pkwy Off Ramp	6,749	4%	5,151	5%

4. ACCIDENT ANALYSIS

Traffic Accident Surveillance and Analysis System (TASAS) data was provided by Caltrans District 8, which includes accidents that occurred between October 01, 2005 and September 30, 2008 on the I-15 and I-215 freeway from PM12.5 to R19.5 and PM 14.00 to 17.75 respectively including the interchange ramp areas for a period of three years. Table 4 shows the accident rate at the adjacent interchanges and the mainline segment within the study area.

Table 4: TASAS – Accident Rate from 10/01/2005 to 09/30/2008

Location	Feature #	Alignment Line #	Actual *(Per MVM for mainline, per MV for ramp)*			Average *(Per MVM for mainline, per MV for ramp)*		
			Fatal	F + I	Total	Fatal	F + I	Total
Route 15 Mainline:								
Mainline, NB from PM 12.500 to 16.373	3-4, 3-5 6-1	A1, A2	0.003	**0.43**	**1.31**	0.010	0.27	0.79
Mainline, SB from PM 12.500 to 16.373	1-1,3-6, 6-1	A1, A3	0.003	0.19	0.72	0.010	0.27	0.79
Mainline, NB from PM R14.273 to R16.40	6-3	A2	**0.011**	**0.30**	**0.79**	0.008	0.23	0.65
Mainline, SB from PM R14.048 to R16.40	6-3	A3	**0.015**	**0.54**	**1.50**	0.008	0.23	0.65
Mainline, NB from PM R13.799 to R14.275 *	5	B2	**0.024**	0.27	0.51	0.011	0.29	0.84
Mainline, SB from PM R13.799 to R14.048 *	3-7	B3	0.000	0.28	0.69	0.014	0.35	1.00
Route 15 Ramps:								

NB Off to Glen Helen Pkwy, PM 14.565			0.000	**1.75**	**5.97**	0.007	0.37	1.20
SB On from Glen Helen Pkwy, PM 14.587			0.000	**0.96**	**0.96**	0.004	0.18	0.60
SB Off to Glen Helen Pkwy, PM 14.996			0.000	0.00	0.00	0.007	0.37	1.20
NB On from Glen Helen Pkwy, PM 15.008			0.000	0.00	**4.56**	0.004	0.18	0.60
NB Off to SB I-215, PM 16.137	2-1, 3-2	C1	0.000	0.00	0.00	0.003	0.10	0.30
SB Off to SB I-15, PM R14.048 **	2-2	A3	0.000	0.05	0.10	0.003	0.10	0.30
NB On from NB I-15, PM R14.273 **	1-1, 2-3, 2-5, 2-6	A2	0.000	0.03	0.08	0.005	0.20	0.60
SB On from Kenwood Ave, PM R14.787		K4	0.000	**0.63**	**0.63**	0.004	0.18	0.60
NB Off to Kenwood Ave, PM R14.806		K1	0.000	**0.67**	**1.34**	0.007	0.37	1.20
SB Off to Kenwood Ave, PM R15.200		K3	0.000	**7.72**	**15.44**	0.007	0.37	1.20
NB On from Kenwood Ave, PM R15.210		K2	0.000	0.00	0.00	.004	0.18	0.60
Route 215 Mainline:								
Mainline, NB from PM 14.00 to 17.753	2-7, 3-8, 4, 6-2	B1, B2	0.000	0.17	0.66	0.010	0.29	0.90
Mainline, SB from PM 14.00 to 17.753	4, 6-2	B1, B3	**0.028**	**0.50**	**0.99**	0.010	0.29	0.90
Route 215 Ramps:								
SEG SB On from Cajon Blvd, PM 17.075			0.000	**0.77**	**1.54**	0.004	0.23	0.70
NB Off to Devore Rd, PM 17.146		D1	0.000	**0.68**	**1.37**	0.004	0.42	1.20
NB On from Devore Rd, PM 17.253			**0.318**	**0.32**	**2.55**	0.008	0.16	0.55
NB Off to SB I-15, PM 17.489	2-4, 3-1, 3-9	C2	0.000	**0.29**	0.49	0.007	0.26	0.80
SEG SB Off to Cajon Blvd, PM 17.654	3-1	D3	0.000	**1.19**	**5.95**	0.004	0.23	0.70

* TASAS identifies this as part of the I-15 'mainline', however it is actually a portion of the northbound and southbound I-215 connectors.

** TASAS identifies this as a 'ramp' to the freeway but actually it is the I-15 'mainline' northbound and southbound.

Note: **BOLD** # Indicate actual is higher than the statewide average.

TASAS-TSN data indicates that the accident actual total rate, when compared to the statewide average at the adjacent interchanges, at similar facilities, is higher at (9) nine locations along Route 15 and (5) five locations along Route 215. The PROJECT is expected to reduce congestion on Interstate 15 and 215 thereby reducing the accident rates in the area.

The accident rates for various sections of the state highways are above and below the statewide average for similar facilities. This discussion will look into the higher accident rates to identify the possible causes and corrective actions this project can implement to reduce these accident rates.

The northbound I-15 from PM 12.5 to 16.3 has accident rates higher than the statewide average. This is the location where the freeway narrows from 4 to 3 lanes and there is recurring congestion typically in the evenings. This project will add 1 to 2 lanes within this area to reduce congestion. A similar reduction in the accident rate is anticipated.

The northbound I-15 from PM R14.2 to R16.4 has accident rates higher than the statewide average. This is the location where the freeway merges with lanes from I-215. Northbound trucks from I-215 must weave across the I-15 lanes to reach the slow lanes. There is also a non standard weaving distance to the Kenwood off-ramp. It is believed that many of the accidents in this area are related to these weaving / merging maneuvers. This project will construct northbound truck bypass lanes in all of the alternatives, which will eliminate the truck weaving maneuver and the congestions related to it. The northbound Kenwood off-ramp will only be accessible from the truck bypass, thus eliminating the non standard weaving section. A similar reduction in the accident rate is anticipated.

The southbound I-15 from PM R14.0 to R16.4 has an accident rate higher than the statewide average. This is in the location where 2 auxiliary lanes are added prior to I-15 diverging from the mainline on the right side. There is also a non-standard weaving area between the SB Kenwood on-ramp and the I-215 diverge on the left creating a short weaving area for the number of lanes which need to be crossed to access the I-215 connector. It is believed that the substantial number of lane changes associated with I-15 traffic staying on I-15 is causing congestion in this area and contributes to the higher accident rates. Alternatives 2, 3 & 3A resolve the issue associated with I-15 diverging on the right side. In these three alternatives, route continuity is provided with the I-215 traffic diverging on the right and I-15 auto traffic staying in the left 3 lanes. The SB Kenwood on-ramp cannot access I-215 in these configurations also eliminating the non standard weave. In alternative 5, the basic configuration of the I-15 diverging on the right is maintained and so is the Kenwood on-ramp and the short weaving section. Alternative 5 does provide a SB truck bypass to I-215 which will remove the SB trucks from the weaving area. The length of the auxiliary lanes is made standard providing a longer distance for vehicles to make the needed lane changes prior to the truck bypass and the I-215 connector. These designs are anticipated to reduce the accident rate in this area.

The northbound off and on-ramps at Glen Helen Parkway have higher accident rates than similar facilities statewide. It is believed that this has the same cause as does the I-15 mainline in this area where the #4 lane northbound is forced off at Glen Helen Parkway.

The northbound off-ramp at Kenwood Ave has a slightly higher accident rate than similar facilities statewide. It is believed that this has the same cause as does the I-15 mainline in this area where there is a congested weaving

area. The reconfiguration of the off-ramp from the truck bypass lanes is expected to reduce the accident rate for the ramp.

The southbound Kenwood off-ramp has an accident rate higher than the statewide average. This high rate (15.44 vs. 1.2) can be attributed to only a few accidents on a relatively low volume ramp. These accidents mostly involve trucks descending Cajon Pass and experiencing what appear to be related to brake failure, or the inability to stop at the ramp termini.

The SB I-215 mainline has an accident rate slightly higher than the average. Improvements in this area will add a 3rd lane and a wider left shoulder. These improvements should improve the situation.

The SB I-215 collector–distributor road (PM 17.075 and 17.654) has accident rates higher than the statewide average for a similar facility. This collector-distributor road has a very short weaving section where traffic from the NB 15 connector cross SB I-215 traffic headed to the Devore Rd off-ramp. This off-ramp also has a tight radius 'hook' configuration. The southerly end of this weaving section also has a crest vertical curve with limited sight distance. These 3 factors contribute to the high accident rate in Alternatives 2, 3 & 3A the weaving section is eliminated by use of various braiding configurations. In Alternative 5 a weaving section is provided along the Truck bypass which is about 5 times longer than the existing weaving area. In all alternatives hook ramps are moved further south, a larger radius is provided and a longer deceleration distance provided prior to the first curve. All of these proposed designs are expected to reduce the accident rate along this section of freeway.

The northbound I-215 off and on-ramps at Devore Rd have accident rates higher than the statewide average. The non-standard geometric configuration of the ramps may be contributing factors to this. The on-ramp has a compound curve ending in a very tight loop merge with high speed auxiliary lanes and weaving area immediately prior to the connector to SB I-15. All alternatives eliminate the loop on-ramp to NB I-215 as well as the short auxiliary lane. Alternatives 2 and 5 provide standard hook on-ramps further south. Alternative 3 and 3A provide direct ramp to NB I-215.

5. INCREMENTAL IMPROVEMENTS

The designs proposed already incorporate as much of incremental improvements as possible. There are no additional incremental improvements possible without providing the full standards as outlined in each feature.

6. FUTURE CONSTRUCTION

This project is compatible with the proposed I-15 ultimate facility currently under study by SANBAG and Caltrans. The Route Concept Fact Sheet dated 1999, addresses the ultimate facility as being an 8+2 freeway. The I-15 Corridor Feasibility Study has three conceptual elements for the ultimate facility. When finally approved, these features will be incorporated into the new Route Concept Report currently being updated by Caltrans. The three elements being considered are:

- Add two HOV lanes (traditional widening adjacent to #1 lane)
- Construct 'Managed' lanes (similar to the reversible lanes in San Diego on I-15)
- Construct barrier separated "Truck Only" Lanes.

The managed lane concept could be 2, 3 or 4 lanes wide with or without a movable barrier to reconfigure the number of lanes in the heavier direction of travel. Reversible use of these lanes would favor the heaviest demand direction. The HOV and Managed lanes can be accommodated in the median of the south leg of I-15. The truck lane concept takes up the most width which would require outside widening of the south leg of I-15. The north leg of I-15 presents a challenge to this project because it is unknown which alternative will be selected for the corridor. The northbound and southbound roadbeds are on independent profiles and are separated vertically by up to15 feet. Addition of more than one lane in the median will require extensive use of retaining walls for several miles.

An optional configuration on this leg would be to construct a 3rd roadbed on an independent profile further up the side of the hill, easterly of the northbound lanes. This new roadbed could be used for either the northbound mainline or the new 'managed' or 'truck' lanes. The existing northbound roadbed might be used for the managed/truck lanes if the northbound auto traffic uses the new roadbed. Close coordination with the corridor project will be needed as final design approaches.

The I-215 corridor also needs to be considered in these designs as it has not been built to its ultimate width which is 8 MF lanes + 2 HOV lanes. The August 1999 Route Concept Fact sheet identified the need for two HOV lanes on this section of I-215 just to meet the 2015 traffic demand. A revised Route Concept Report is being prepared by Caltrans at this time. The ultimate facility for I-215 will be considered in the development of this project.

7. PROJECT REVIEWS, CONCURRENCE

The exception has been reviewed during the Geometric Approval Drawing phase by the following individuals:

1. Brian Frazer, P.E., Headquarters Design Reviewer (concurred 6/30/10, ~~BF~~)
2. Gideon Agra, P.E., Design Oversight Engineer (concurred 7/1/10, ~~GA~~)
3. Theresa Sasis, P.E., Traffic Operations Reviewer (concurred 7/1/10, TS)

8. ATTACHMENTS

Attachment 1 - Location Map

Attachment 2 - Key Map

Attachment 3 - Design Exception Feature # 2 & 3 - (Sheet 11)

Attachment 4 - Design Exception Feature # 1, 2 & 3 - (Sheet 12)

Attachment 5 - Design Exception Feature # 2, 3 & 4 - (Sheet 13)

Attachment 6 - Design Exception Feature # 2 - (Sheet 14)

Attachment 7 - Design Exception Feature # 2 - (Sheet 15)

Attachment 8 - Design Exception Feature # 2 - (Sheet 16)

Attachment 9 - Design Exception Feature # 2 & 5 - (Sheet 18)

Attachment 10 - Design Exception Feature # 5 - (Sheet 20)

Attachment 11 - Design Exception Feature # 2 - (Sheet 36)

Attachment 12 - Design Exception Feature # 2 & 3 - (Sheet 38)

Attachment 13 - Design Exception Feature # 2 & 3 - (Sheet 39)

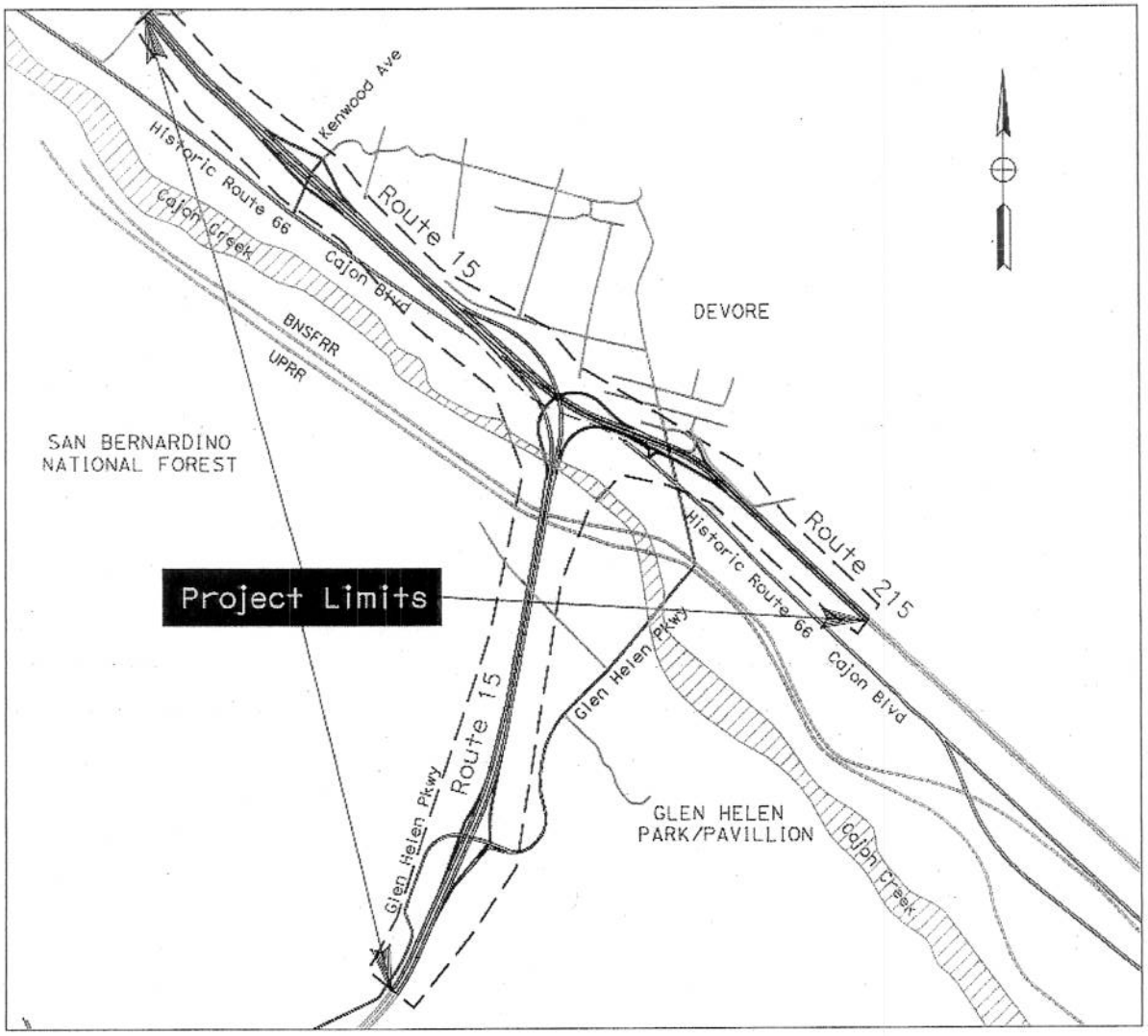
Attachment 14 - Design Exception Feature # 2 & 3 - (Sheet 40)

Attachment 15 - Design Exception Feature # 2 - (Sheet 41)

Attachment 16 - Design Exception Feature # 6 - (Sheet IC SPACING)

Attachment 17 - Design Exception Feature # 1 - (Sheet P-1)

Attachment 1
Location Map



Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0, 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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

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

LAN ENGINEERING CORP
1887 BUSINESS CENTER DR
SUITE 6
SAN BERNARDINO, CA 92408

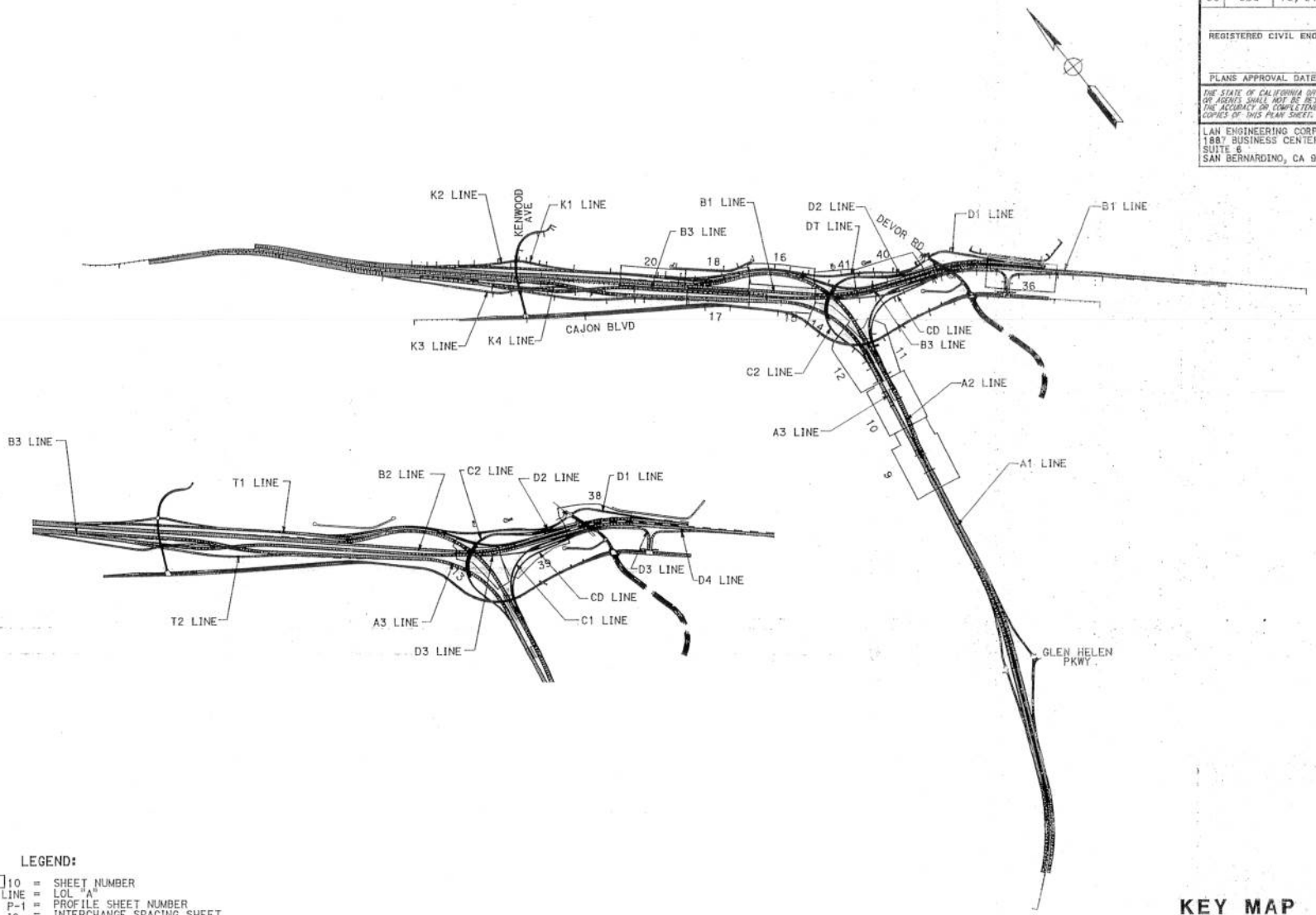
SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



LEGEND:

10 = SHEET NUMBER
A3 LINE = LOL "A"
P-1 = PROFILE SHEET NUMBER
IC = INTERCHANGE SPACING SHEET

KEY MAP
MANDATORY
DESIGN EXCEPTION
ATTACHMENT 2

NO SCALE

LOU SOSHIN | DATE PLOTTED => 6/24/2010 | 00-00-00 TIME PLOTTED => 11:41:36 AM

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => LAN Engineering | DGN FILE => Alt 3A Mandatory key map.dgn | CU 00000 | EA 000000

Alt 3A Mandatory key map.dgn 6/24/2010 11:41:36 AM

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII
DESIGN EXCEPTION FEATURE #3 - MINIMUM STOPPING SIGHT DISTANCE AT HORIZONTAL CURVE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0, 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — NO. EXP. CIVIL — STATE OF CALIFORNIA

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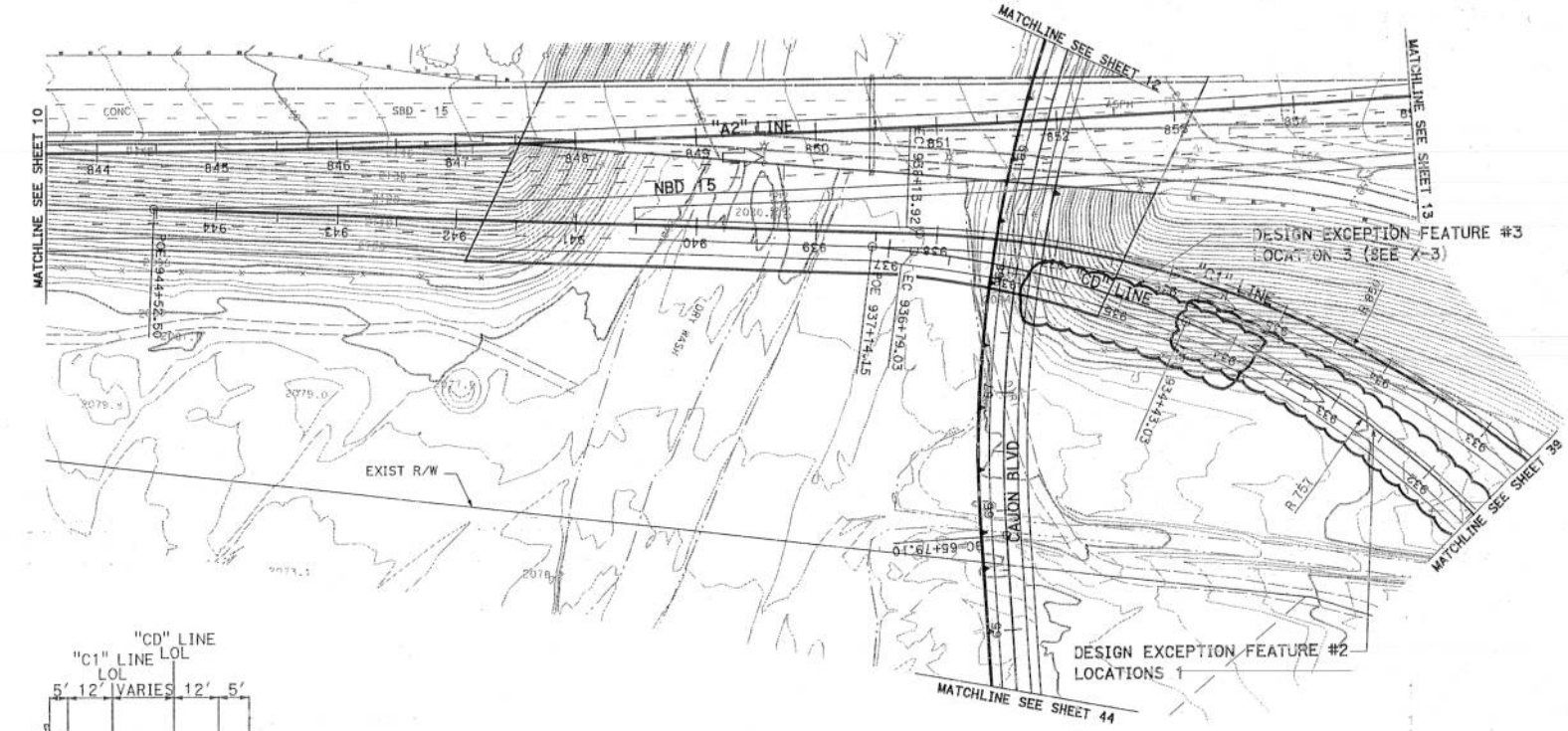
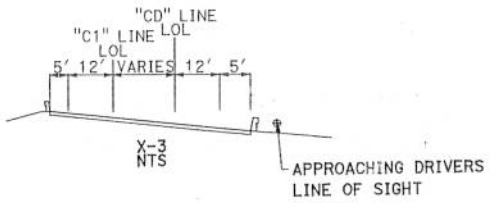
LAN ENGINEERING CORP 1987 BUSINESS CENTER DR SUITE 6 SAN BERNARDINO, CA 92408	SANBAG 1170 W 3RD STREET SAN BERNARDINO, CA 92410





MANDATORY DESIGN EXCEPTION ATTACHMENT 3

SCALE: 1"=100'

SHEET 11

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION | CONSULTANT FUNCTIONAL SUPERVISOR | CALCULATED-DESIGNED BY | CHECKED BY | REVISED BY | DATE REVISED

BORDER LAST REVISED 6/1/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => LAN Engineering
DGN FILE => Alt 3A Mandatory 11.dgn

CU 00000 | EA 000000

LAST SESSION DATE PLOTTED => 6/24/2010
00-00-00 TIME PLOTTED => 11:29:30 AM

Alt 3A Mandatory 11.dgn 6/24/2010 11:29:29 AM

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #1 - STOPPING SIGHT DISTANCE STANDARDS
DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII
DESIGN EXCEPTION FEATURE #3 - MINIMUM STOPPING SIGHT DISTANCE AT HORIZONTAL CURVE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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

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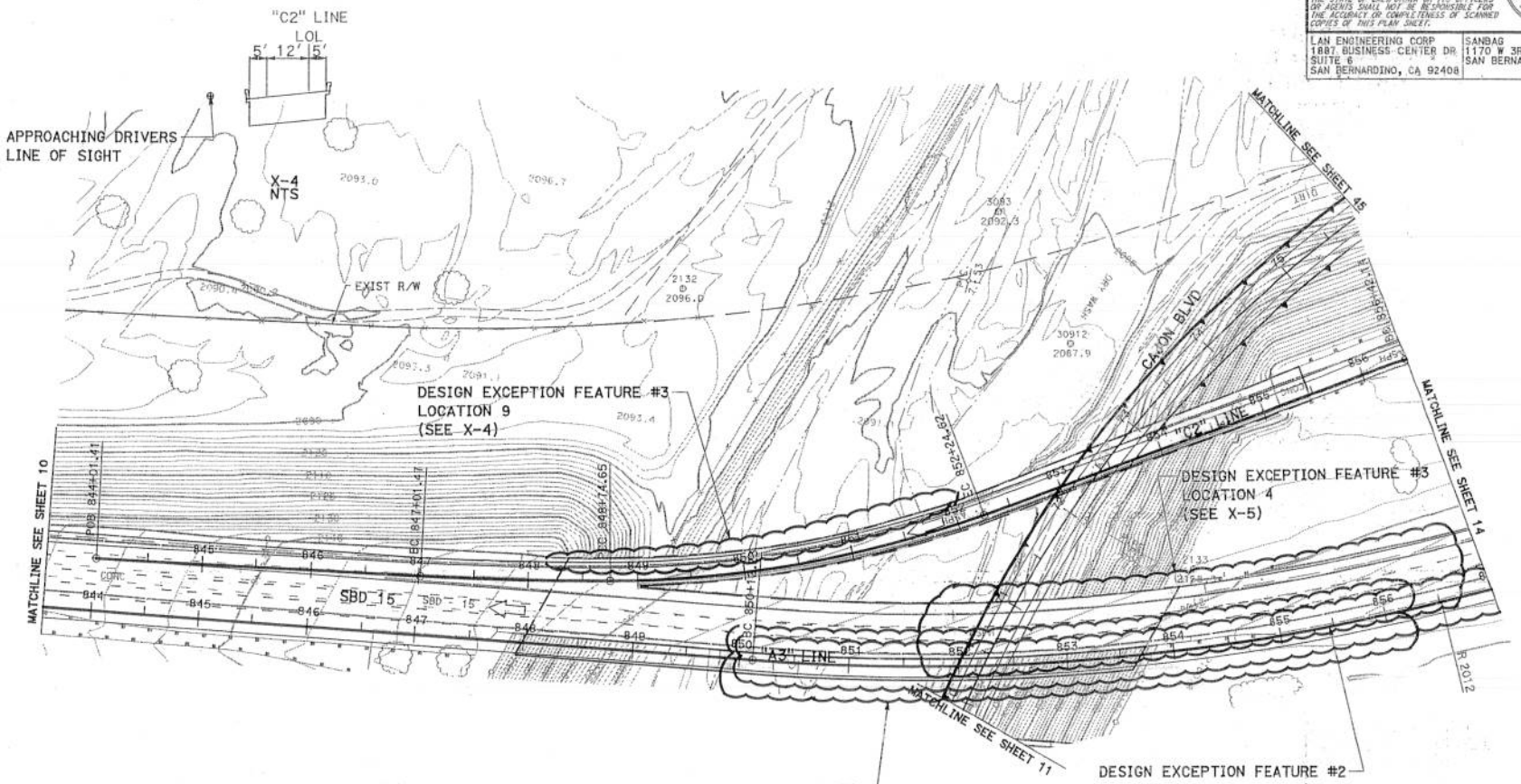
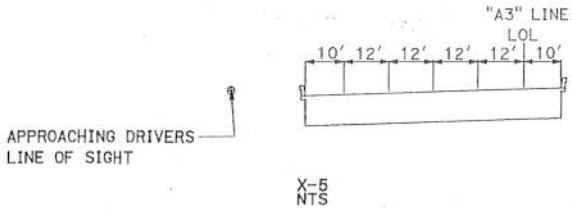
1887 BUSINESS CENTER DR
SUITE 6
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410





MANDATORY DESIGN EXCEPTION ATTACHMENT 4

SCALE: 1"=100'

SHEET 12

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION | CONSULTANT FUNCTIONAL SUPERVISOR | CALCULATED-DESIGNED BY | CHECKED BY | REVISED BY | DATE REVISED

DATE PLOTTED => 6/24/2010
TIME PLOTTED => 11:30:15 AM

BORDER LAST REVISED 4/1/2008
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
USERNAME => LAN Engineering
DGN FILE => Alt 3A Mandatory 12.dgn
CU 00000
EA 000000

Alt 3A Mandatory 12.dgn 6/24/2010 11:30:15 AM

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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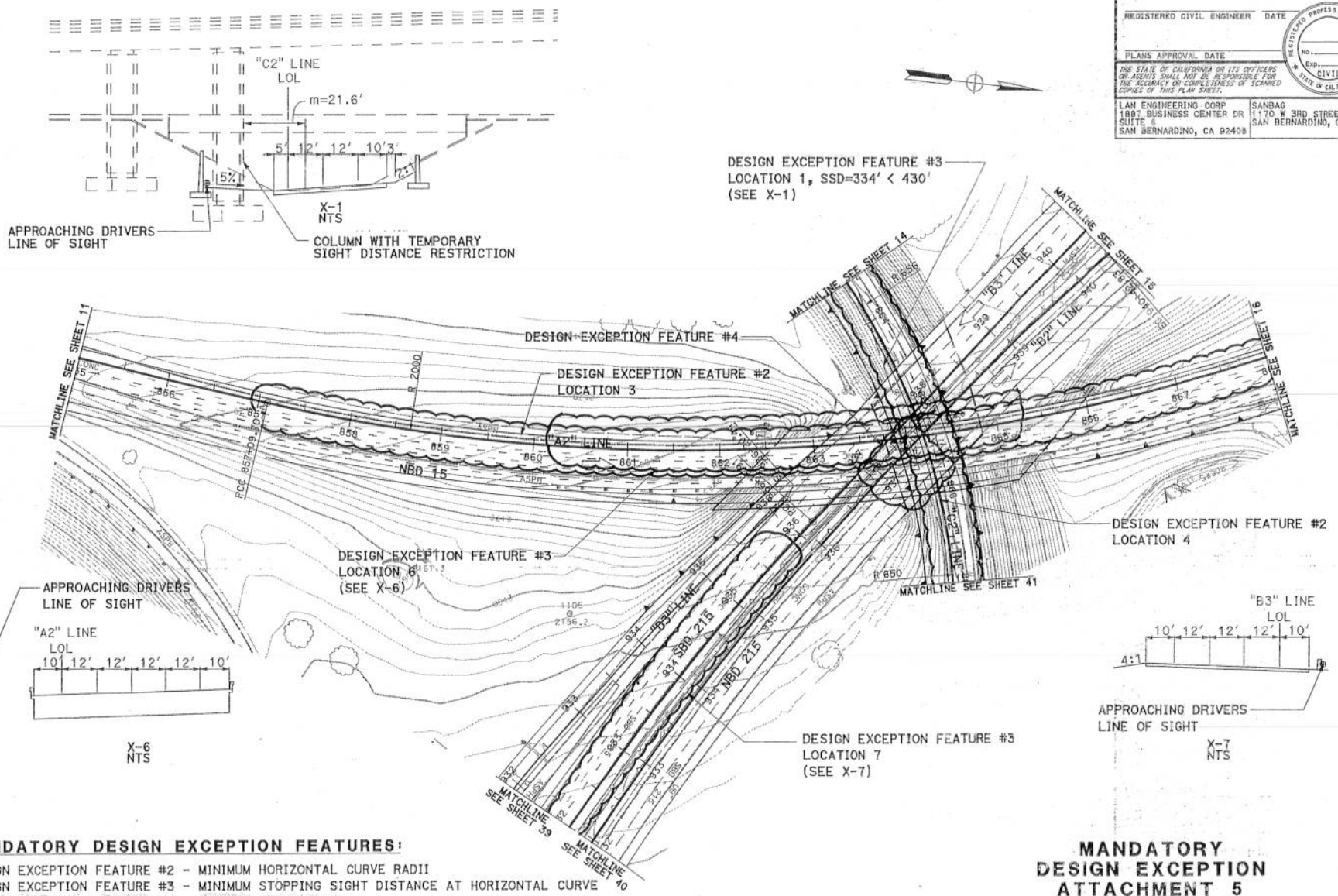
LAN ENGINEERING CORP
1887 BUSINESS CENTER DR
SUITE 6
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

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

STATE OF CALIFORNIA — DEPARTMENT OF TRANSPORTATION



MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII
DESIGN EXCEPTION FEATURE #3 - MINIMUM STOPPING SIGHT DISTANCE AT HORIZONTAL CURVE
DESIGN EXCEPTION FEATURE #4 - MINIMUM CLEARANCES

MANDATORY DESIGN EXCEPTION ATTACHMENT 5

SCALE: 1"=100'

SHEET 13

LAST REVISION DATE PLOTTED => 6/24/2010
00-00-00 TIME PLOTTED => 11:30:48 AM

BORDER LAST REVISED 4/1/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => LAN Engineering
DGN FILE => Alt 3A Mandatory 13.dgn

CU 00000 EA 000000

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0, 16.0/17.13		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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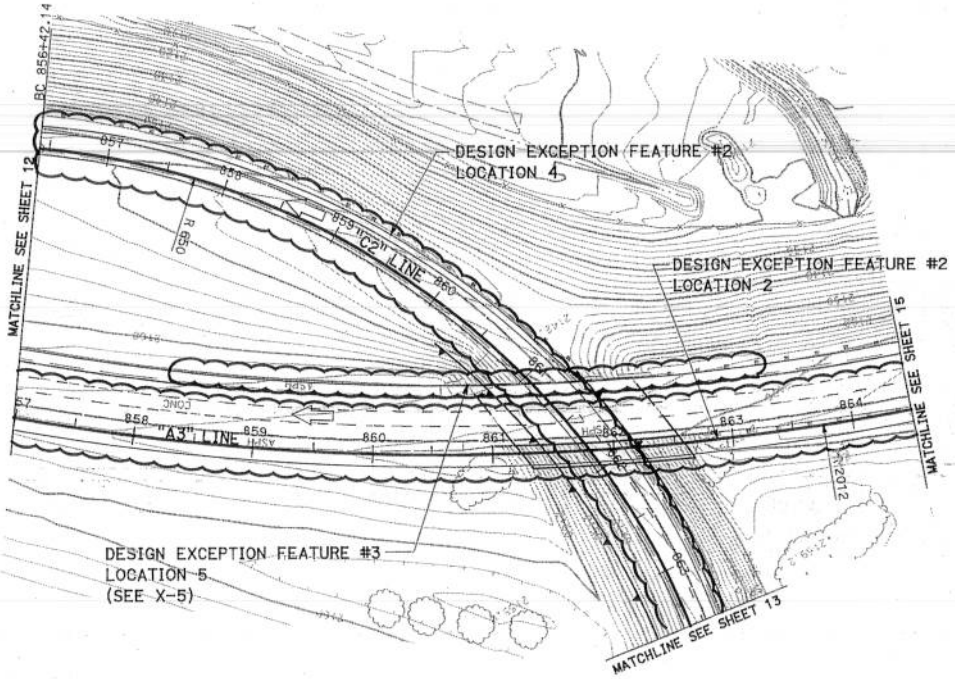
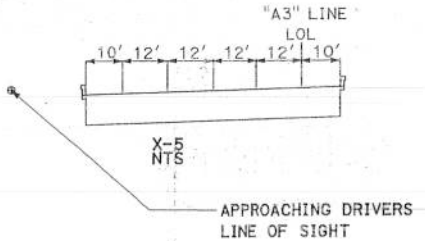
LAN ENGINEERING CORP
1887 BUSINESS CENTER DR
SUITE 6
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410





MANDATORY DESIGN EXCEPTION ATTACHMENT 6

SCALE: 1"=100'

SHEET 14

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

DATE PLOTTED => 6/24/2010
TIME PLOTTED => 11:32:34 AM

BORDER LAST REVISED 4/1/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => LAN Engineering
DGN FILE => Alt 3A Mandatory 14.dgn

CU 00000

EA 000000

Alt 3A Mandatory 14.dgn 6/24/2010 11:32:34 AM

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 – MINIMUM HORIZONTAL CURVE RADII

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.8/16.0 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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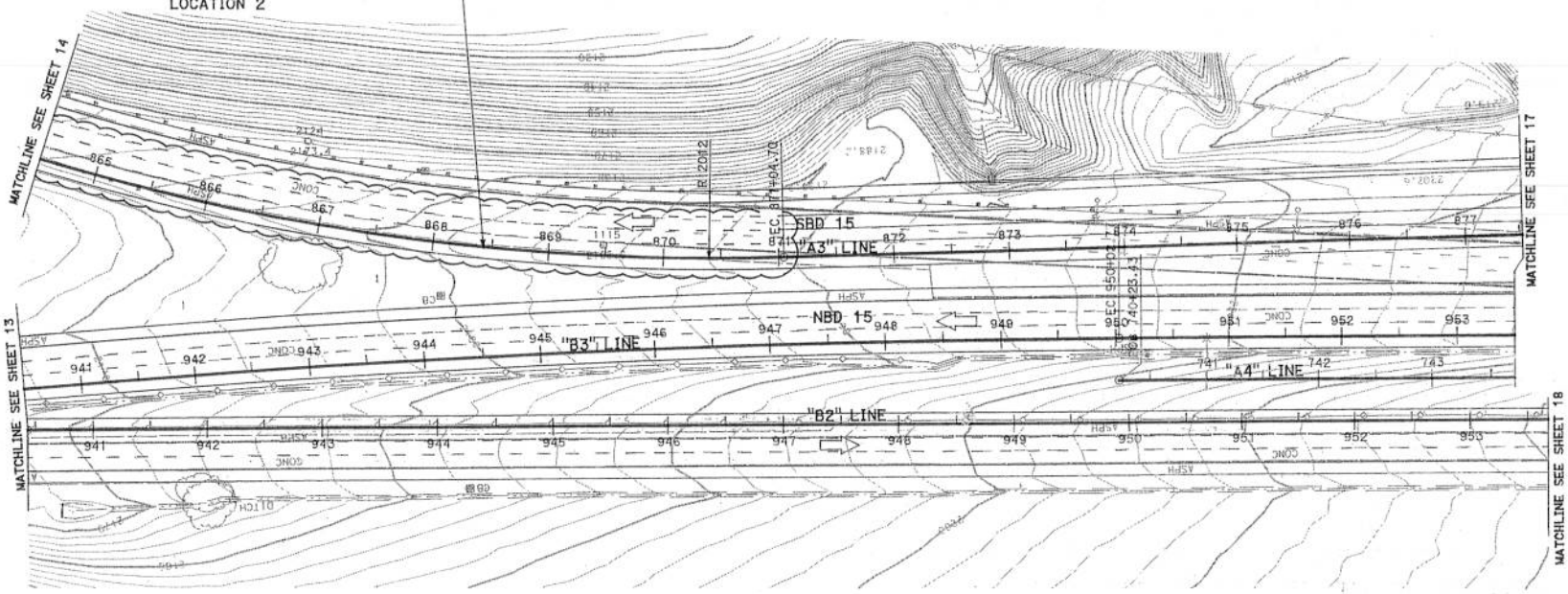
LAN ENGINEERING CORP
1887 BUSINESS CENTER DR
SUITE 6
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

DESIGN EXCEPTION FEATURE #2
LOCATION 2



MANDATORY DESIGN EXCEPTION ATTACHMENT 7

SCALE: 1"=100'

SHEET 15

REVISED BY | DATE REVISED | CALCULATED-DESIGNED BY | CHECKED BY | CONSULTANT FUNCTIONAL SUPERVISOR | STATE OF CALIFORNIA – DEPARTMENT OF TRANSPORTATION

BORDER LAST REVISED 4/1/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => LAN Engineering
DGN FILE => Alt 3A Mandatory 15.dgn

CU 00000 | EA 000000

DATE PLOTTED => 6/24/2010
TIME PLOTTED => 11:34:50 AM

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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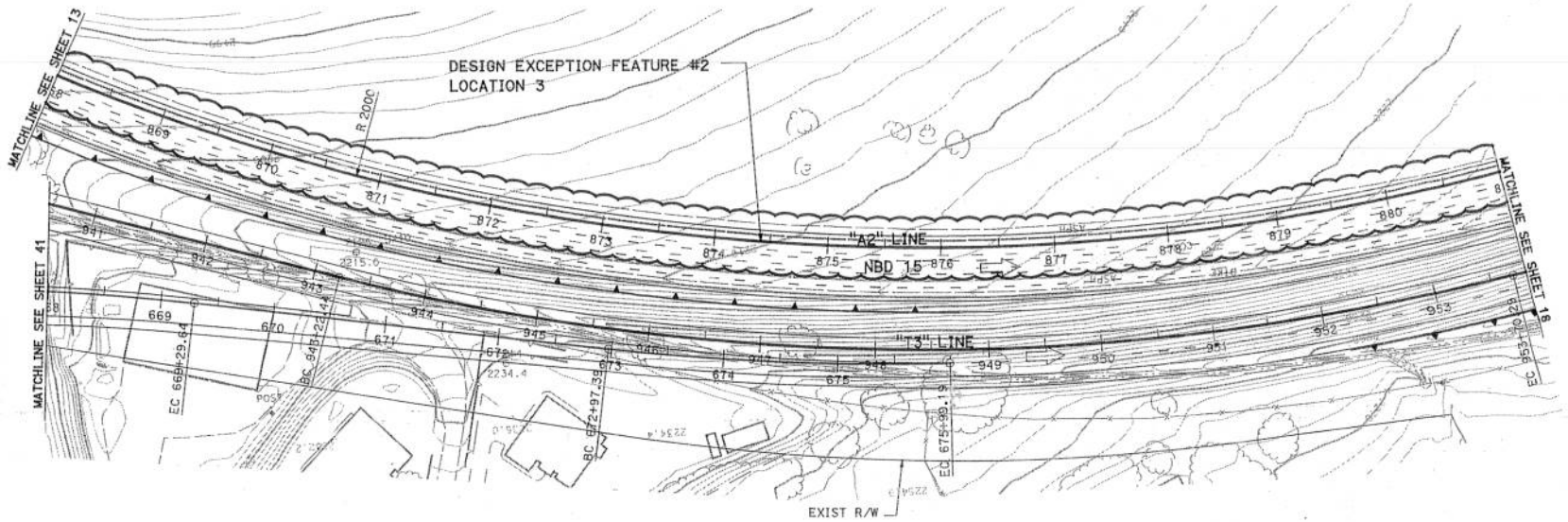
LAN ENGINEERING CORP
1887 BUSINESS CENTER DR
SUITE G
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410



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

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

MANDATORY DESIGN EXCEPTION ATTACHMENT 8

SCALE: 1"=100'

SHEET 16

BORDER LAST REVISED 4/1/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => LAN Engineering | DGN FILE => Alt 3A Mandatory 16.dgn | CU 00000 | EA 000000

LAST REVISION DATE PLOTTED => 6/24/2010
00-00-00 TIME PLOTTED => 11:36:00 AM

Alt 3A Mandatory 16.dgn 6/24/2010 11:36:00 AM

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII
DESIGN EXCEPTION FEATURE #5 - FREEWAY ENTRANCES AND EXITS SHALL CONNECT TO THE RIGHT OF THROUGH TRAFFIC

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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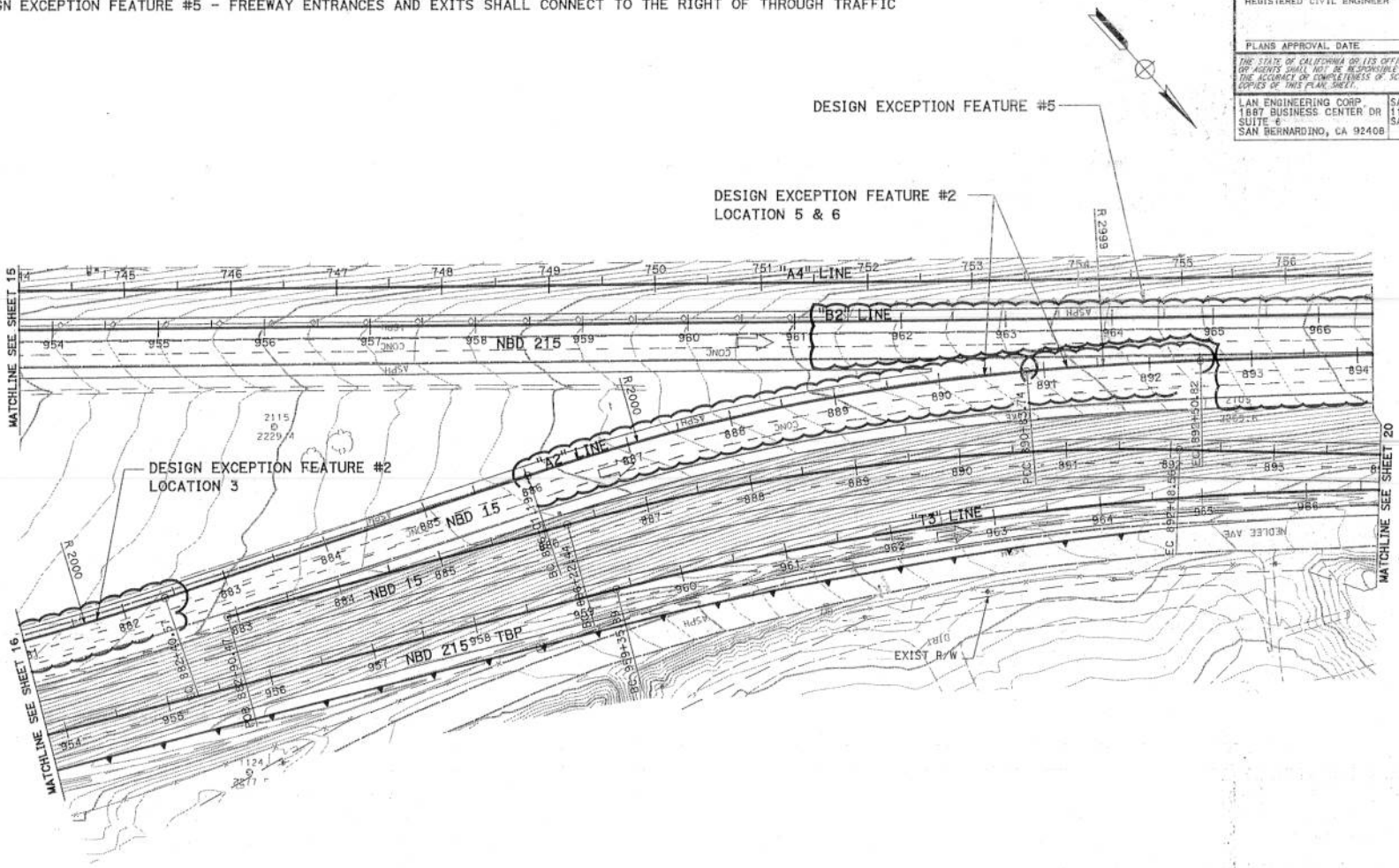
LAN ENGINEERING CORP.
1687 BUSINESS CENTER DR
SUITE C
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410



MANDATORY DESIGN EXCEPTION ATTACHMENT 9

SCALE: 1"=100'

SHEET 18

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION | CONSULTANT FUNCTIONAL SUPERVISOR | CALCULATED-DESIGNED BY | CHECKED BY | REVISED BY | DATE REVISED

BORDER LAST REVISED 4/1/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => LAN Engineering
DGN FILE => Alt 3A Mandatory 18.dgn

CU 00000

EA 000000

LAST REVISION DATE PLOTTED => 6/24/2010
00-00-00 TIME PLOTTED => 11:36:40 AM

Alt 3A Mandatory 18.dgn 6/24/2010 11:36:40 AM

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #5 - FREEWAY ENTRANCES AND EXITS SHALL CONNECT TO THE RIGHT OF THROUGH TRAFFIC

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0, 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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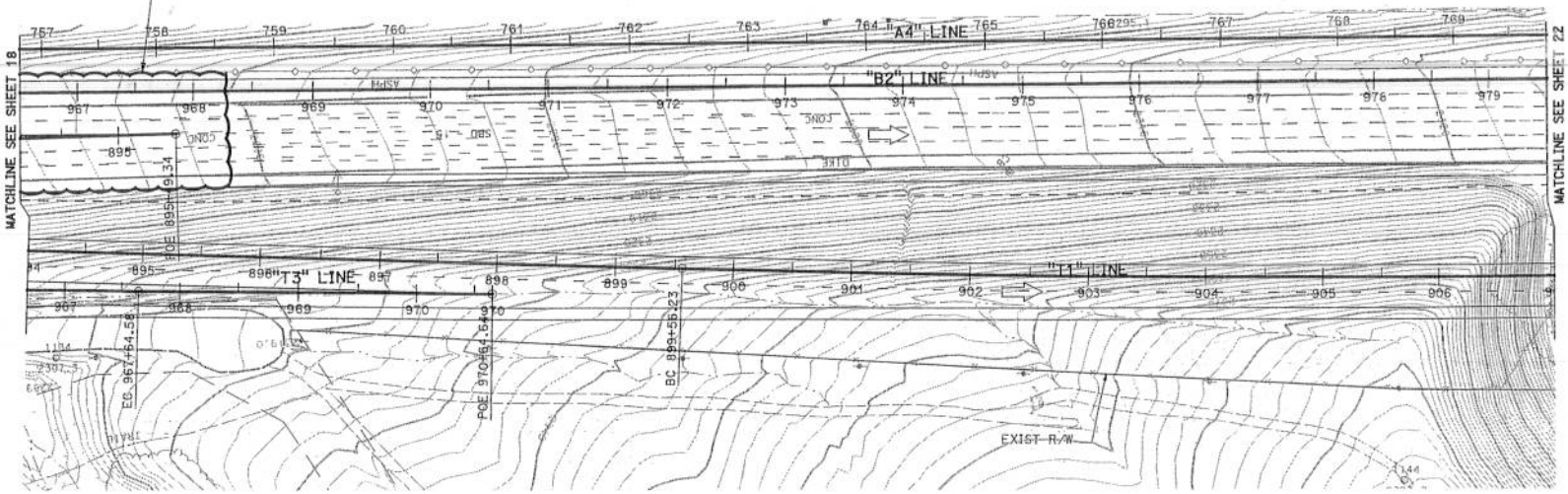
LAN ENGINEERING CORP 1867 BUSINESS CENTER DR SUITE 6 SAN BERNARDINO, CA 92408	SANBAG 1170 W 3RD STREET SAN BERNARDINO, CA 92410

DESIGN EXCEPTION FEATURE #5



REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

MANDATORY DESIGN EXCEPTION ATTACHMENT 10

SCALE: 1"=100'

SHEET 20

LAST REVISION DATE PLOTTED => 6/24/2010
00-00-00 TIME PLOTTED => 11:37:40 AM

BORDER LAST REVISED 4/1/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => LAN Engineering
DGN FILE => Alt 3A Mandatory 20.dgn

CU 00000

EA 000000

Alt 3A Mandatory 20.dgn 6/24/2010 11:37:40 AM

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII
DESIGN EXCEPTION FEATURE #3 - MINIMUM STOPPING SIGHT DISTANCE AT HORIZONTAL CURVE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/17.75		

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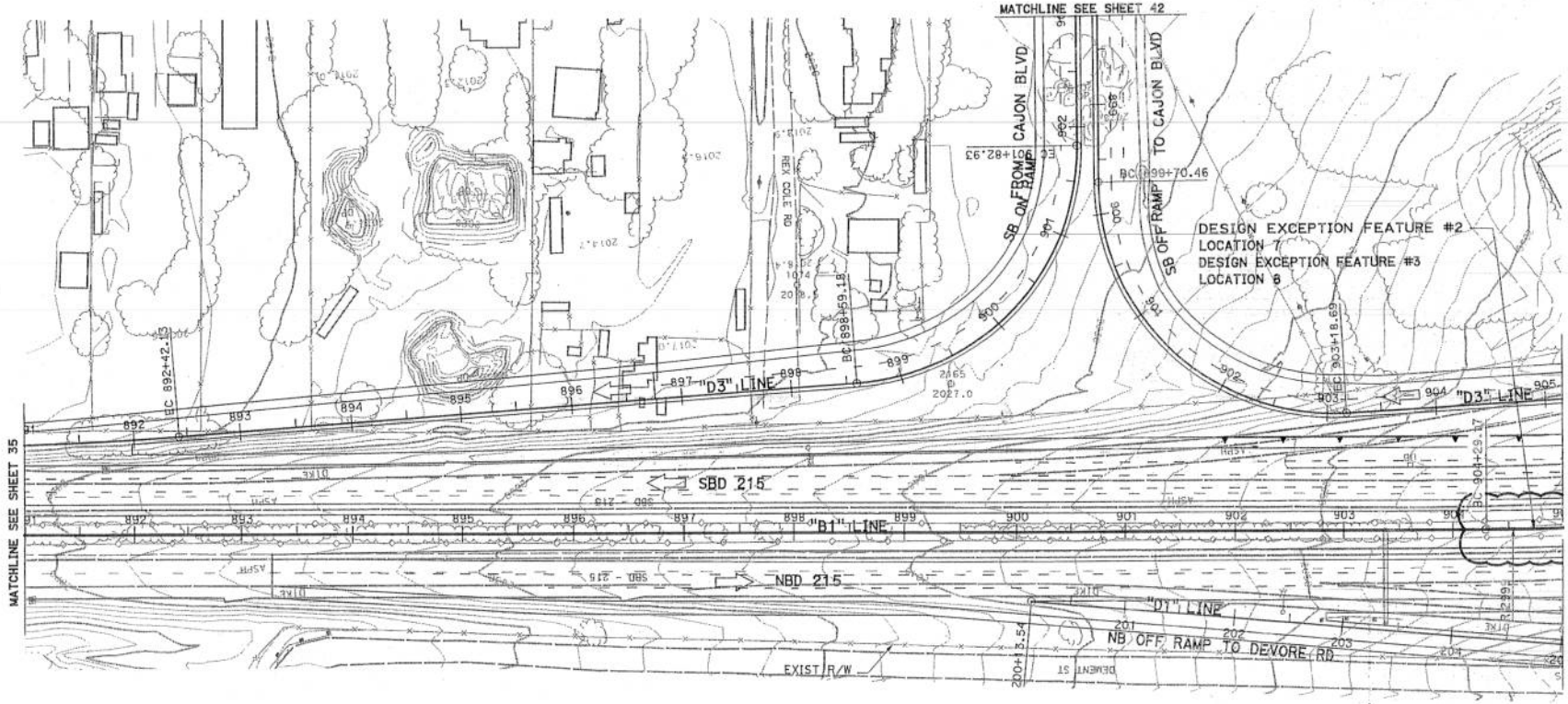
1887 BUSINESS CENTER DR
SUITE 6
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

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

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



MANDATORY DESIGN EXCEPTION ATTACHMENT 11

SCALE: 1"=100'

SHEET 36

DATE REVISION
00-00-00

DATE PLOTTED => 6/24/2010
TIME PLOTTED => 11:38:06 AM

BORDER LAST REVISED 4/1/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => LAN Engineering
DGN FILE => Alt 3A Mandatory 36.dgn

CU 00000

EA 000000

Alt 3A Mandatory 36.dgn 6/24/2010 11:38:06 AM

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0, 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

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LAN ENGINEERING CORP
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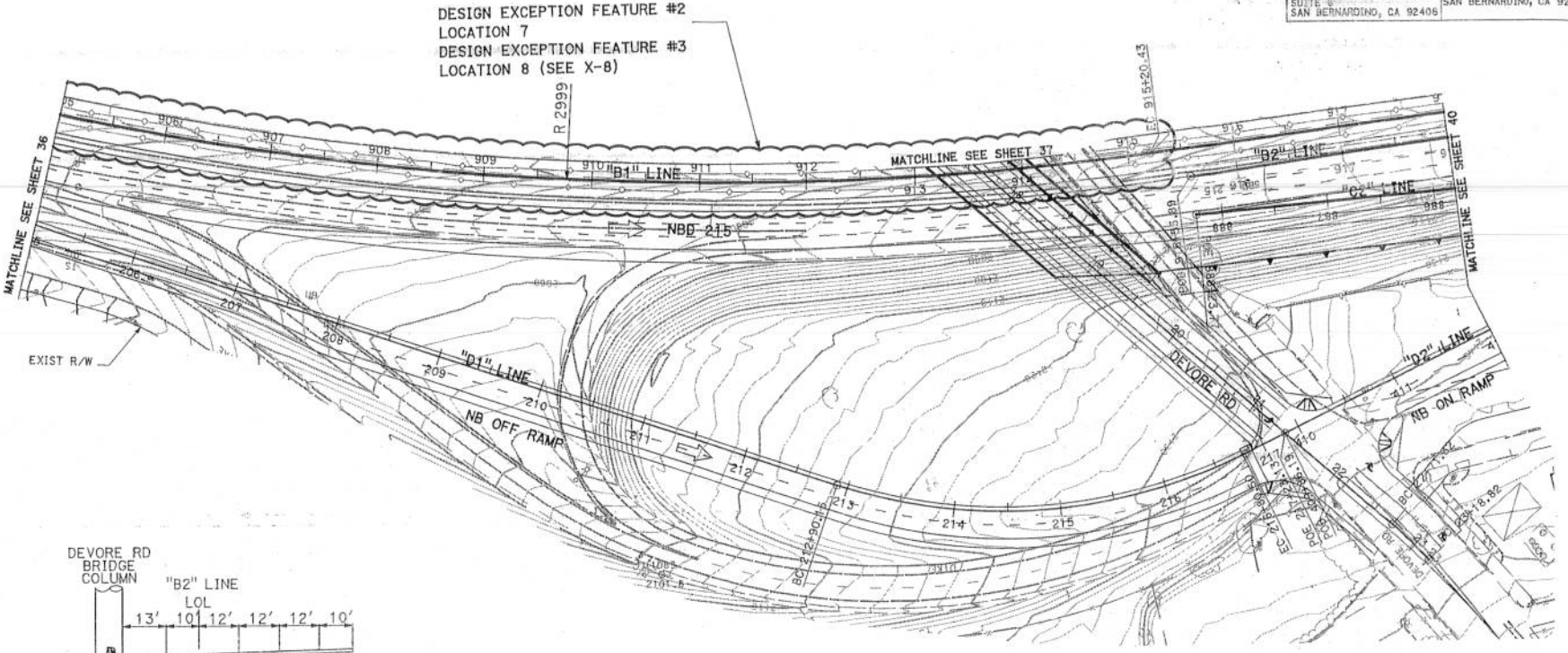
SUITE C
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII
DESIGN EXCEPTION FEATURE #3 - MINIMUM STOPPING SIGHT DISTANCE AT HORIZONTAL CURVE



MANDATORY DESIGN EXCEPTION ATTACHMENT 12

SCALE: 1"=100'

SHEET 38

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

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

BORDER LAST REVISED 4/1/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => LAN Engineering | DGN FILE => Alt 3A Mandatory 38.dgn | CU 00000 | EA 000000

LOCK SETTINGS | DATE PLOTTED => 6/24/2010 | TIME PLOTTED => 11:38:49 AM | 00-00-00

Alt 3A Mandatory 38.dgn 6/24/2010 11:38:48 AM

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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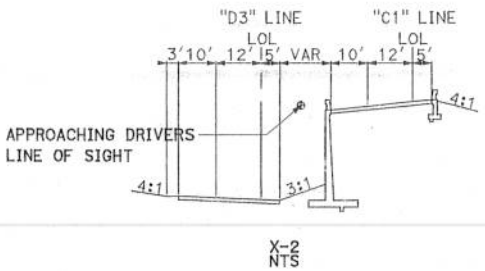
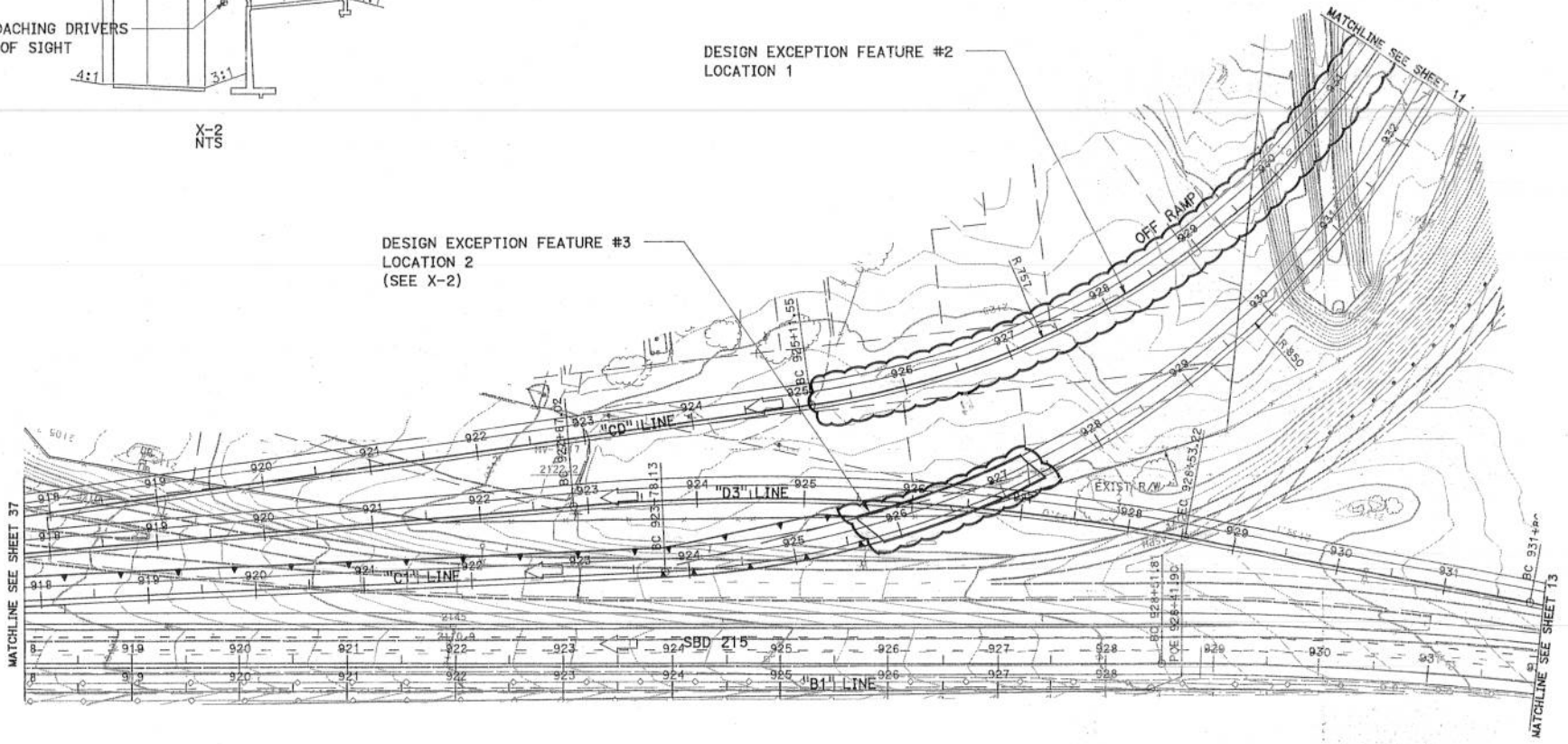
LAN ENGINEERING CORP 1867 BUSINESS CENTER DR SUITE C SAN BERNARDINO, CA 92408	SANBAG 1170 W 3RD STREET SAN BERNARDINO, CA 92410

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII
DESIGN EXCEPTION FEATURE #3 - MINIMUM STOPPING SIGHT DISTANCE AT HORIZONTAL CURVE



X-2
NTS



MANDATORY DESIGN EXCEPTION ATTACHMENT 13

SCALE: 1"=100'

SHEET 39

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION | CONSULTANT FUNCTIONAL SUPERVISOR | CALCULATED-DESIGNED BY | CHECKED BY | REVISED BY | DATE REVISED

LAST REVISION DATE PLOTTED => 6/24/2010
00-00-00 TIME PLOTTED => 11:39:19 AM

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | USERNAME => LAN Engineering | DGN FILE => Alt 3A Mandatory 39.dgn | CU 00000 | EA 000000

Alt 3A Mandatory 39.dgn 6/24/2010 11:39:19 AM

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII
DESIGN EXCEPTION FEATURE #3 - MINIMUM STOPPING SIGHT DISTANCE AT HORIZONTAL CURVE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0, 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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REGISTERED PROFESSIONAL ENGINEER No. EXP. CIVIL STATE OF CALIFORNIA

LAN ENGINEERING CORP
1087 BUSINESS CENTER DR
SUITE 6
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

REVISED BY | DATE REVISED

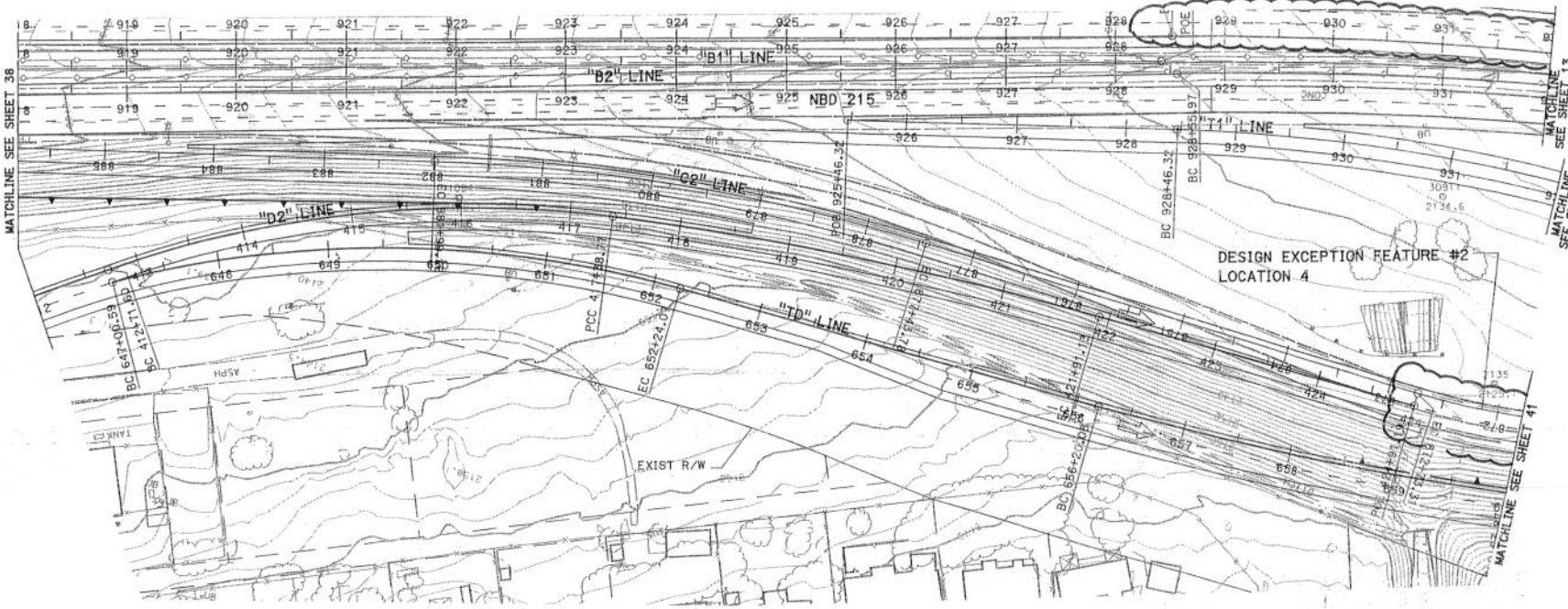
CALCULATED-DESIGNED BY | CHECKED BY

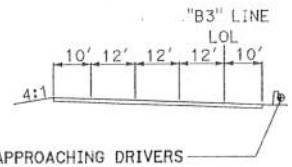
CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

DESIGN EXCEPTION FEATURE #3
LOCATION 7
(SEE X-7)





X-7
NTS

MANDATORY DESIGN EXCEPTION ATTACHMENT 14

SCALE: 1"=100'

SHEET 40

LAST REVISION DATE PLOTTED => 6/24/2010
00-00-00 TIME PLOTTED => 11:39:45 AM

BORDER LAST REVISED 4/1/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => LAN Engineering
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MANDATORY DESIGN EXCEPTION FEATURES:

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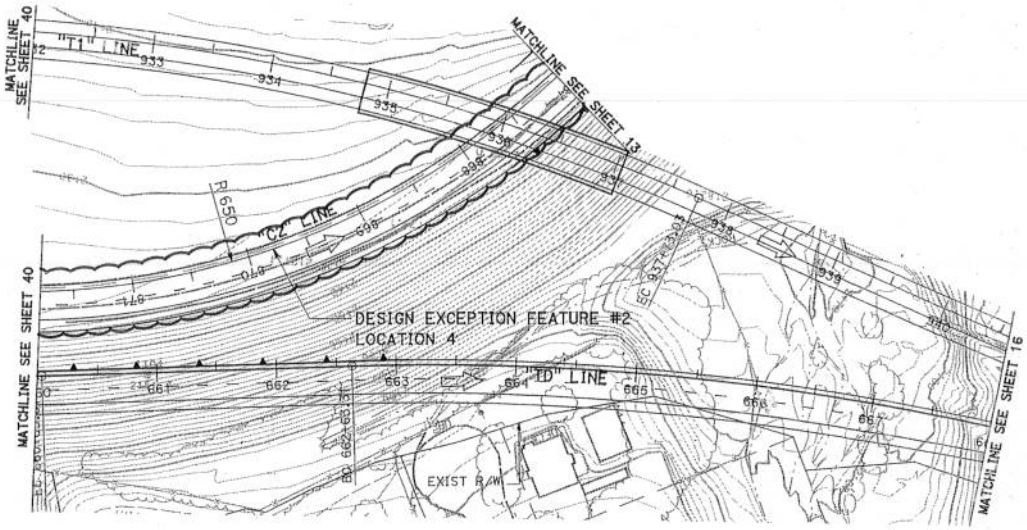

Dist	COUNTY	ROUTE	TOTAL PROJECT	NO.	SHEETS
08	SBd	15, 215	13.5/16.0, 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

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REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

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MANDATORY DESIGN EXCEPTION ATTACHMENT 15

SCALE: 1"=100'

SHEET 41

LAST REVISED 00-00-00 | DATE PLOTTED => 6/24/2010 | TIME PLOTTED => 11:40:43 AM

BORDER LAST REVISED 4/1/2008

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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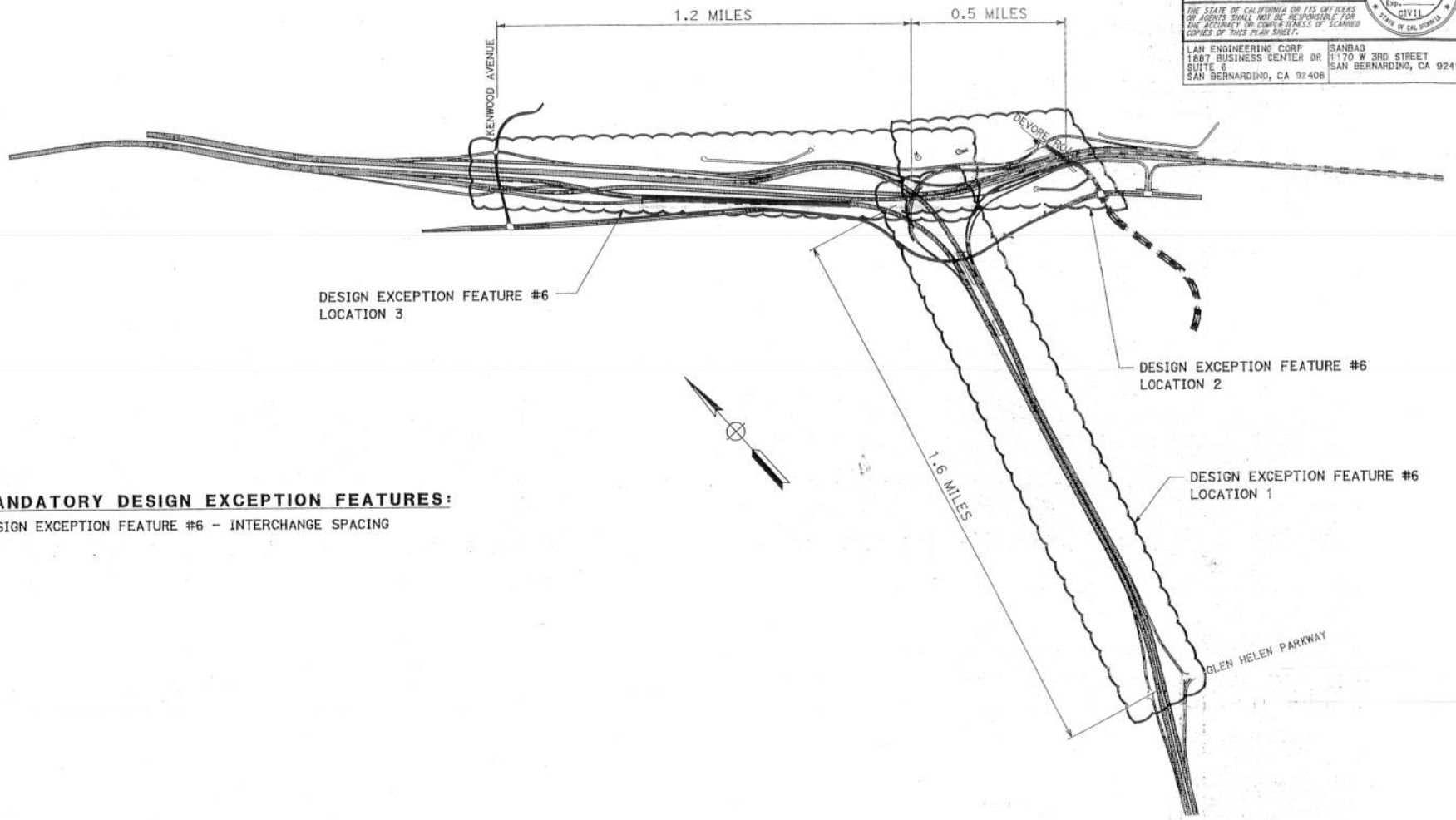

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #6 - INTERCHANGE SPACING

MANDATORY DESIGN EXCEPTION ATTACHMENT 16

NO SCALE

IC SPACING

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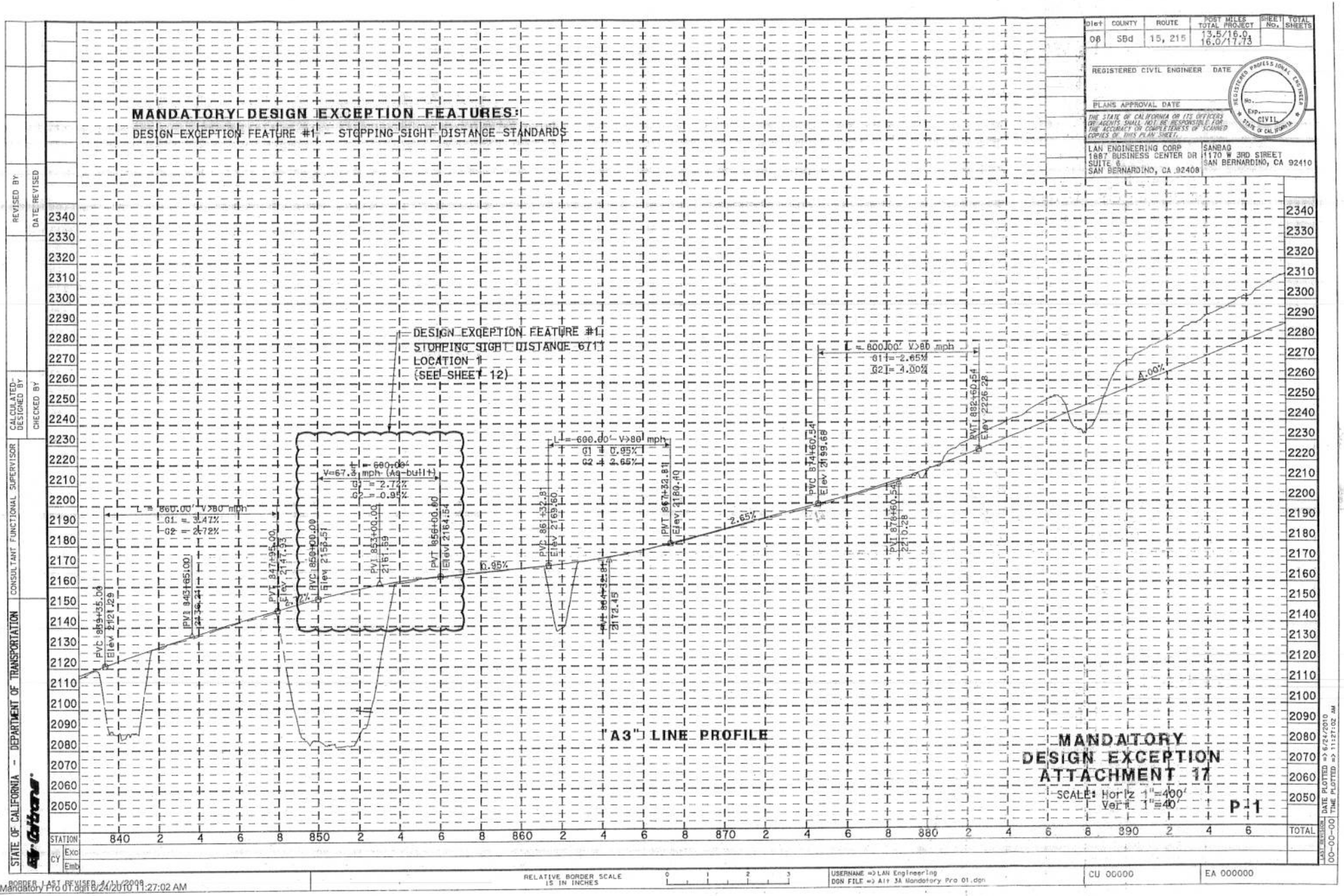

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/17.73		

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EA 000000

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EXHIBIT 11-B

Fact Sheet Exceptions to Advisory Design Standards

08-SBd-15, 215, PM 14.0/R16.4, 16.0/17.8
EA 08-0K7100
I-15/I-215 Interchange
February 2010

Fact Sheet Exceptions to Advisory Design Standards

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1. PROPOSED PROJECT

1.1. Proposed Project Description

San Bernardino Associated Governments (SANBAG), in cooperation with California Department of Transportation (Caltrans) proposes to reconfigure Interstate 15/Interstate 215 (I-15/I-215) Interchange near Devore (unincorporated area), County of San Bernardino, CA. These sections of highway are access controlled Interstate Freeways adopted by the California Transportation Commission (CTC) in 1969. The purpose of the proposed project is to eliminate congestion, reduce accidents, restore route continuity for I-15, construct truck bypass lanes, and improve non-standard weaving between interchanges. Three alternatives were considered ranging from $350 million to $437 million. Project funding is anticipated to be a combination of State, Federal, Local and Measure I funds. The support cost of the PA & ED is estimated to be $3.5 million.

1.2. Existing Highway

Interstate 15 crosses between the San Gabriel and San Bernardino Mountains in an area known as Cajon Pass. The Cajon Pass area encompasses approximately twelve miles of freeway from Sierra Avenue in Fontana to Oak Hills Road just past the Cajon summit in the Hesperia area.

I-15 is a major south/north route through Riverside and San Bernardino Counties. I-215 branches from I-15 in Temecula in Riverside County just north of San Diego County line. The I-15 proceeds north through the cities of Norco and Corona before entering San Bernardino County through the cities of Ontario, Rancho Cucamonga, Fontana and Rialto. I-215 ultimately reconnects with I-15 in Devore area in San Bernardino County. Separation between I-15 and I-215 corridors is generally about fifteen to twenty miles. I-15 provides one of two south/north links with the National Interstate Network in the Riverside and San Bernardino areas.

Within the project limits, I-15 consists of four mixed flow lanes in each direction from Route 60 to Glen Helen Parkway three mixed flow lanes in each direction from Glen Helen Parkway to I-215, and four mixed flow lanes northerly of the junction with I-215, and one truck climbing lane in the northbound direction only.

Interstate 215 is a major route between Temecula and Devore in Riverside and San Bernardino Counties. I-215 begins in Temecula following an old alignment of U.S. Route 395 through Riverside County, passing through Riverside and San Bernardino, and ending at the junction with I-15 in Devore. Within the project limits, I-215 consists of two through mixed flow lanes in each direction.

NORTH JUNCTION OF I-15/I-215

This junction is basically a "Y" type of system interchange that was constructed in the late 1960s with the alignment towards San Bernardino being the primary move and the southwesterly leg being the diverging route. Because of this, the design standards for the diverging route are less than mainline standards for an Interstate. Currently, the design speeds for the I-15 southwest leg to the Northwest leg in the NB direction is greater than 80 mph based on the vertical alignment, but is about 69 mph based on the horizontal alignment, while SB direction is 67 mph (vertical) and 69 (horizontal). Therefore, the existing minimum design speeds are less than the desired design standard for an Interstate mainline. The construction of this interchange retained a connection to Devore Road (Glen Helen Parkway) on the I-215 leg which was less than the current standard of a two mile spacing between a system interchange and a service interchange. Along the I-15 alignment, interchanges were made at Kenwood which is slightly less than two miles from the system interchange and a local interchange with Glen Helen Parkway to the south, which also is slightly less than the two mile spacing.

1.3. Safety Improvements

Many of the design elements in the project improve current non standard features, provide additional capacity or make operational improvements that will have an impact to improve safety for the freeway.

The following improvements provided by this project will enhance safety:

- Add truck bypass lanes through the interchange to eliminate difficult auto/truck weaving conflicts.
- Rebuild the I-215/Devore Road Interchange to eliminate non-standard geometric features.
- Reconfigure the existing I-15/Kenwood Avenue interchange to eliminate non-standard geometric features.
- Eliminating the freeway mainline weaving areas: NB I-215 at Devore Road, NB and SB I-15 between I-215 and Kenwood Avenue.

Northbound I-15

- Adding a northbound mainline line between the Glen Helen Parkway off-ramp and the I-215 junction to reduce congestion.
- Adding a northbound auxiliary lane between the Glen Helen Parkway on-ramp and the I-215 junction to improve operation.
- Construct auxiliary lanes to provide for weaving traffic.
- Widen existing Northbound I-15 to Northbound I-15 Connector to add one lane and allow for passing of slower traffic.

Southbound I-15

- Adding a southbound mainline lane between the I-215 junction and the Glen Helen Parkway on-ramp to provide additional capacity.
- Adding a southbound auxiliary lane between the I-215 junction and the southbound Glen Helen Parkway off-ramp to improve operation of the freeway.
- Add auxiliary lanes to provide for merging and diverging traffic.
- Southbound I-15 and I-215 will braid with each other in order to provide route continuity and eliminate a left hand exit ramp.

Northbound I-215

- Construct one additional northbound lane to provide needed capacity.
- Reconfigure the northbound on-ramps at Devore Road to eliminate a loop on-ramp with high accident rate.
- Realign northbound off ramp at Devore Road to make alignment standard.
- Construct Northbound I-215 truck bypass to eliminate auto/truck weaving conflicts.

Southbound I-215

- Reconfigure and add one additional lane to the southbound connector to provide needed capacity.
- Braid the Northbound I-15 to Southbound I-215 connector and the Southbound Devore Road off ramp to eliminate a short weaving area along a CD road.
- Reconstruct southbound off ramp and on ramp approximately 500 feet southerly of the proposed intersection of Glen Helen Parkway with Devore Road to improve geometry.

1.4. Total Project Costs

The total estimated project cost within the project limits consists of (1) construction cost, (2) right-of-way acquisition cost and (3) Support Cost as follows:

(1) Construction Cost:	Alt 3A
Roadway	$187,391,000
Structure	$54,500,000
(2) Right-of-Way Acquisition Cost: (including utility relocation)	$47,937,240
(3) Support Cost: (Permits and Mitigation Expenses)	$24,688,280
Total Project Capital Cost:	**$314,517,000**

2. FEATURES REQUIRING AN EXCEPTION

There are seventeen locations that require advisory design exceptions (Refer to Attachment 2, Key Map for sheet locations for Advisory Design Exceptions).

2.1. Design Exception Feature #1 – Stopping Sight Distance

Nonstandard Features (refer to Attachments 7 & 18):
Along the existing "A3" Line, southbound I-15 mainline, the existing profile, prior to Cajon Creek Bridge, consists of a 600' vertical curve. 20% increase in stopping sight distance is not incorporated into the design

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 201.3 - Stopping Sight Distance
"The stopping sight distances in Table 201.1 should be increased by 20 percent on sustained downgrades steeper than 3 percent and longer than one mile."

Reasons for Requesting Exception:
Prior to the Cajon Creek crossing, the southbound I-15 is on a downgrade for over 1 mile at a gradient of 4- 4.5% which requires the application of this standard to increase the SSD by 20%. The provided SSD is 671 feet and the required SSD is 930 feet plus 186 feet (20%). Where the southbound lanes cross over Cajon Creek the freeway is on a crest vertical curve. This vertical curve is actually ½ mile beyond the end of the steeper grade which requires the 20% increase. The profile immediately preceding this curve is only at a -1% grade. The following narrative documents the decisions related to this particular feature.

It is proposed to keep the profile of this location per the existing to minimize on impacts to the creek, which is under the jurisdiction of State and Federal agencies being a "Water of the US" or 'Water of the State" below the bridge. The bridge is a large structure over Cajon Creek and in order to apply this standard would require either an entirely new bridge to be constructed westerly of the existing one, or reduce traffic to only 2 lanes while a new structure on the new profile is constructed beside it. The replacement of this structure would require 2 stages impacting traffic for 18-24 months. If a new bridge on a new alignment were constructed the impacts would be that a large area of the San Bernardino Kangaroo Rat (SBKR) habitat would need to be mitigated as well as acquiring a "1601" permit covering a larger area than currently proposed. Also, one of the main benefits of Alt 3A was to utilize as much of the existing pavement and structures as possible and save on cost. To make

standard, a complete replacement of the existing structures and a portion of the existing roadway would be required. Drivers traveling along this segment of the A3 Line, southbound I-15 would not be able to see vehicle taillights for the required SSD in this particular area. Also, more time is needed for the reconstruction resulting in an increased exposure to traffic. The actual accident rates for this section of southbound I-15 (PM 12.500 to 16.373) are below the statewide average for a similar highway facility as shown in Table 4.

Added Cost to Make Standard:
Rebuilding of the existing bridge and rebuilding of portions of the roadway on either side of the bridge would be necessary to increase the SSD of this existing crest vertical curve. The cost of roadway is $1,500,000. The cost of structures is $9,750,000. The total added cost to make standard is estimated at $11,250,000. These additional costs represent 4.7 % of the total project's construction cost.

2.2. Design Exception Feature #2 – Alignment Consistency

Nonstandard Features (refer to Attachments 7, 9 & 10):
A 3,129 foot tangent along the existing "A3" Line ends with a 2,012 foot radius curve at BC station 871+04.70. The horizontal curve's design speed is 69 mph; while the previous curve's design speed is 80mph .

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 203.3 - Alignment Consistency
"Where physical restrictions on curve radius cannot be overcome and it becomes necessary to introduce curvature of lower standard than the design speed for the project, the design speed between successive curves should change not more than 10 miles per hour. Introduction of curves with lower design speeds should be avoided at the end of long tangents, steep downgrades, or at other locations where high approach speeds may be anticipated."

Reasons for Requesting Exception:
This standard attempts to keep consecutive curves within a 10 mph design speed of each other. The curve preceding this location has a design speed of 80 mph and this location, which is the southbound I-15 "A3" line, has a design speed of 69 mph, creating a difference of 11 mph instead of the standard 10 mph. The second curve, with the 69 mph design speed, is an existing roadway that we are utilizing in this alternative to save on environmental impacts and, as mentioned above, one of the main benefits of Alt 3A was to utilize as much of the existing pavement and structures as possible. For this alternative there is no possible way to increase the radius of this alignment without substantial cost increases. One of the possible solutions would be to go to the preceding curve and design it to a 79 mph design speed. However, that too would require a design exception. Also, changing the previous curve would provide negligible help because the speed would still naturally increase due to the long downgrade between the curves. The existing second curve has accident data which indicates that it has a lower than statewide accident rate for this curve. Therefore, we do not believe that keeping this curve will have an adverse effect on the safety and operation of the roadway.

Added Cost to Make Standard:
To bring the curve up to standard would require revising the stretch of roadway and two bridges through out the length of curve. The added cost to make standard is estimated at $17,000,000. These additional costs represent 7.0 % of the total project's construction cost.

2.3. Design Exception Feature #3 – Coordination of Horizontal and Vertical Alignment

Nonstandard Features (refer to Attachments 8, 9 & 20):
The horizontal curve along the existing "C2" Line between station 856+42.14 and station 872+73.31 has a radius of 650 feet, which correlates to a design speed of 43 mph. There is a 400 foot vertical curve between station

862+03.70 and station 866+03.70. The vertical curve's design speed is greater than 80 mph. The horizontal curve should have a design speed of a least 80 mph

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 204.6 - Coordination of Horizontal and Vertical Alignment
"On highways in mountainous or rolling terrain where horizontal and vertical curves are superimposed at a grade summit or sag, the design speed of the horizontal curve should be at least equal to that of the crest or sag, and not more than 10 miles per hour less than the measured or estimated running (85th percentile) speed of vehicles on the approach roadway."

(Note: The "85th percentile" rule is used by traffic engineers to establish speed limits. The speed limit should be set to the speed that separates the bottom 85% of vehicle speeds from the top 15%)

Reasons for Requesting Exception:
This particular feature along the "C2" line is an existing roadway for the horizontal and vertical alignment. The project is widening this connector to provide a second lane for passing opportunities; however, the horizontal and vertical alignments are being retained in an effort to minimize impacts to right of way and environmental areas adjacent to the freeway. This particular alignment introduces a 400 foot sag vertical curve midway through a horizontal curve with design speed greater than 80 mph. Reconfiguration of the horizontal curve to obtain a higher design speed is not feasible considering the existing constraints of roadways and bridges. Accident data for this connector (PM, 17.489) is available in Table 4, although the actual (F+I) rate of 0.29 is slightly higher then the average (F+I) rate of 0.26, the actual total accident rate compared to an average total rate is lower for this section of the roadway. The existing accident rate is below the average and we expect the improvement we will be constructing here will not have an adverse affect on the accident rate. As mentioned in the Mandatory Design Feature # 3 - Stopping Sight Distance, A cut slope on the left side of the connector had restricted SSD to 43 mph. However, a retaining wall is proposed to be placed at 24 feet from the edge of the shoulder which will meet the standard SSD. The single column obstruction, the stopping sight distance (SSD) will never meet the standard for 50 mph design speed and taillight will not be visible at this particular spot due to the bridge column.

Added Cost to Make Standard:
The cost to make standard includes realignment under existing roads, new pavement and new structures. The structures that will need to be replaced included Cajon Creek Bridge Lt, Center Connector Bridge, West Connector Bridge, and widening on Devore Overhead Left. The added cost to make standard is estimated at $29,400,000. These additional costs represent 12.2 % of the total project's construction cost.

2.4. Design Exception Feature #4 – Median Width

Nonstandard Features (refer to Attachments 3, 4, 5, 8 & 14):

At location 1, the median along the existing I-15 "A1" Line transitions from a width of 36' to a width of 22' beginning from station 791+00 to 801+40. This transition is roughly equivalent to a taper rate of 58:1. However, it is not noticeable since it occurs through a curve along the main line. The median continues at a 22' width from station 801+40 to station 826+49.86 and then transitions to the required 36' and wider median at station 830+60.

At location 2, the median along the existing I-215 "B1" Line transitions from a width of 36' to a width of 22' beginning from Station 927+55 to about 936+90. Then the median transitions back to the required 36' width (and wider) at Station 940+45.

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 305.1, (1)(a) - Median Width
"Minimum median widths for the design year should be used in order to accommodate the ultimate highway facility (type and number of lanes):"
"the minimum median width for freeways and expressways in urban areas should be 36 feet."

Reasons for Requesting Exception:
Location 1 – Along I-15 alignment (3, 4 & 5)
In this particular location the median is 22 feet wide, whereas, it should be 36 feet wide. This project is constructing four additional lanes within the existing dirt median to avoid outside widening of the freeway within this area, which is from Glen Helen Parkway to the railroad overhead. If the freeway median were maintained and all widening happened on the outside, embankments and cut sides would need to be widened for the four extra lanes. To accomplish this additional right of way would be required consisting of private uses and county park properties. Park land is a 4f resource we have, to this point, been able to avoid. A follow-up project proposes to add high capacity lanes in the median of an unknown width. If standard median standards apply to that project also, additional right of way will again be needed from the park. So is to avoid additional environmental impacts in these areas. It is proposed as an interim measure to use the median until the follow-up project selects a x-section and a know need is of right of way can be required once. The northbound I-15 accident rate is currently 1.31 compared to an average of 0.79. This is higher than the average and is considered to be a result of the bottleneck condition at this location where we have four lanes narrowing down to only three lanes in the northbound direction. The construction of one additional mixed flow lane and one additional auxiliary lane between the interchanges at Glen Helen Parkway and I-215 are anticipated to provide additional capacity and relieve the congestion which is considered to be the contributing factor to the high accident rate. It is believed that the improvements proposed here will improve the operations and safety of this section of roadway. In the southbound direction this area has an accident rate very equivalent to the average. The existing accident rate is 0.72 which is slightly lower than the 0.79 statewide average. We don't believe that the southbound improvement will have an adverse effect on the operations or safety of the freeway in this area.

Location 2 – Along the I-215 alignment (8 & 14)
At this location the median is 22 feet wide, whereas it should be 36 feet wide. The construction of the interchange originally built the B2 and B3 alignment (NB and SB mainline) as the mainline freeway toward San Bernardino. The bridge at this location spans over the C2 connector and was designed to accommodate three lanes northbound and three lanes southbound with standard 10 foot shoulders on the outside and a 22 foot median in between the two roadways. This would provide for 10 foot shoulders and two feet for median barrier. This bridge was configured so it could be widened another 12' on the outside to make room for one more lane. In order to make the median width standard, the Center Connector Undercrossing Bridge (Bridge No. 54-782) will need to be widened by a minimum of 7 feet on each side. Although this can be accommodated under the current project, a follow-up project will need to widen another 12'-16' for an HOV lane or HOT lane connector ramp. The second reason is that there is another bridge (Separation Bridge) above the B2 and B3 alignment which is the A2 or northbound I-15 freeway. This bridge spans over 6 lanes and can accommodate 8 lanes with a 22' median, however it can not accommodate 6 MF lanes + 2 HOV lanes with buffer AND a 36' median. It is possible to widen the B2 and B3 alignment to obtain a standard median however the cost of widening each side of the existing bridge by 7' will provide minimal operational or safety improvements over the proposed condition. When the HOV/HOT lanes are constructed another sliver bridge widening would be needed or even a replacement of the 7' widening constructed under this job making this improvement a throw-away. The reasons for this design exception is to avoid expenditure of funds which will not provide any useful benefit, not accommodate future work and possibly be throw away work. Accident data in this area is mixed with some rates above and some below the state wide average. The higher rates appear to be more associated with a SB lane drop and the NB

215/15 merge as opposed to the median width (which is currently non standard). Project features to eliminate the SB lane drop, and to provide a NB truck bypass will most likely improve the accident rates.

Added Cost to Make Standard:
Location 1, The cost to make standard is estimated at $2.8 million which include the cost of widening the bridge of about 7 feet on each side, roadway and earth work at this location. These additional costs represent 1.1 % of the total project's construction cost.

Location 2, The cost to make standard is estimated at $1.5 million which include a bridge widening, a retaining wall on the I-215 SB, and widened roadways at the bridge approaches. The required widening of the bridge would be about 4' on each side of the freeway. However, this sliver widening would not be structurally feasible since a second widening would be needed for the ultimate lane configuration (1 HOV + 3 lanes). Therefore, the cost will be based on the ultimate bridge widening. These additional costs represent 0.6 % of the total project's construction cost.

2.5. Design Exception Feature #5 – Side Slopes

Nonstandard Features (refer to Attachments 16 & 17):
At location 1, the embankment slope along SB "A4" Line, between station 27+80 and station 73+00, is 2:1 beyond the Clear Recovery Zone (CRZ) limits, with benches at 50 ft intervals of vertical elevation. The standard required slope is 4:1 or flatter.

At location 2, the embankment slope along the SB Kenwood exit ramp "K3" Line, between station 10+40 and station 29+00, is 2:1 beyond the CRZ limits, with benches at 50 ft intervals of vertical elevation. The standard required slope is 4:1 or flatter.

At location 3, the embankment slope along NB "A2" Line, between station 828+50 and station 838+92, is 2:1 beyond the CRZ limits. The standard required slope is 4:1 or flatter.

At Location 4, the embankment slope along NB "A2" Line, between station 841+15 and station 847+55, is 2:1 beyond the CRZ limits, with a bench at 50 ft of vertical elevation. The standard required slope is 4:1 or flatter.

At location 5, the embankment slope along NB "CD" Line, between station 935+30 and station 926+05, is 2:1 beyond the CRZ limits, with a bench at 50 ft of vertical elevation. The standard required slope is 4:1 or flatter.

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 304.1(a)
"For new construction, widening, or where slopes are otherwise being modified, embankment (fill) slopes should be 4:1 or flatter."

Reasons for Requesting Exception:
This feature identifies any side slopes steeper than 4:1 as non standard. In this area, the surrounding terrain in extremely mountainous and construction of 4:1 slopes for the entire length of embankment fills would have a very large impact to the surrounding land. If the standard of the 4:1 slopes were used for the design: Locations 1,2 & 3 slope would extend 100 feet to 150feet farther, and would encroach on SBKR habitat. Location 3 would also require more property takes; Location 4 would extend 250 feet to 300 feet farther out and would encroach onto the old Cajon Blvd and possibly the Arroyo Toad habitat; Location 5 would extend up to 550 feet further out. This is due to the large vertical embankment that the 4:1 slope would need to chase about 70 feet more downward. In discussion with district and headquarters personnel, an alternative cross section was proposed that would

minimize the right of way and environmental impacts affected by 4:1 slopes, yet still meeting the desired benefit of a clear recovery zone adjacent to the freeway mainline. The alternative cross section provides for a 30 foot clear recovery zone with 10:1 slope prior to any slope rounding at the hinge point. The slope rounding would be 10 feet then transition to a 2:1 side slope with benching every 50 foot of vertical. The benching, which currently does not exist in the fill slopes in Cajon Pass, is to minimize erosion effects of rainwater going down these side slopes. These benches would reduce the overall water and erosion potential for these fill slopes. The net result of this cross section is a much reduced footprint for right of way acquisition and impacts to the environmentally sensitive areas at the toe of these slopes. At the northerly limits of these slopes would be very close to Arroyo Toad habitat and the middle portion of the project the slopes extend into the Cajon Creek bed area which is SBKR habitat and also waters of the U.S. By doing this there is a substantial minimization to the effects to environmental resources in this area.

The selected x-section for these areas have the following benefits:

- MBGR adjacent to the edge of shoulder is not needed (as the current freeway has)
- A distance greater than the needed CRZ is provided
- A portion of this 30' could be used as a Bio-Swale to help with storm-water cleanup
- The slope rounding will help the overall aesthetic view of the freeway
- Benching will help minimize embankment erosion
- Benching will provide maintenance access to the side slopes

Added Cost to Make Standard:
The cost to make the slopes standard will be cost excessive with both increased earthwork and increased r/w. The cost of earthwork is $12,750,000. The cost of R/W is $38,500,000. The added cost to make standard is estimated at $51,250,000. These additional costs represent 21.2 % of the total project's construction cost.

2.6. Design Exception Feature #6 - Guidelines for the Location and Design of Curb Ramps

Nonstandard Features (refer to Attachment 13):
Curb returns at the north intersection of Devore Road and "D1" and "D2" Lines have only one curb ramp per corner. Two ramps at each corner are required.

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 105.4 (2) - Location Guidelines
"On new construction, two ramps should be installed at each corner as shown on the Standard Plans."

Reasons for Requesting Exception:
This design standard identifies that the curb return there should have two curb ramps constructed. This standard does not take into consideration whether there are one or two crosswalks approaching this curb ramp. At I-215 northbound ramps and Devore Road, only a single crosswalk is proposed at a curb return which parallels Devore Rd, thus only requiring a single curb ramp.

The intersection for the northbound off ramp to Devore Road is a diamond type configuration (with an off ramp and an on ramp intersecting a two lane local street). The proposed location will have curb and gutter and sidewalk because the adjacent developments of two gas stations have curb, gutter and sidewalk already constructed along their frontage. The crosswalks will be in the north / south direction along Devore Road and there were no proposed crosswalks in the east / west direction for all curb returns, a single curb ramp is being proposed.

Added Cost to Make Standard:
The cost to make each corner standard includes adding a second curb ramp with detectable warning surface at each corner. The added cost to make standard is estimated at $0. These additional costs represent 0.0 % of the total project's construction cost.

2.7. Design Exception Feature #7 - Ramps - Location and Design of Ramp Intersections on the Crossroads (4% grade)

Nonstandard Features (refer to Attachments 11, 12, 13, 19 & 21):
At location 1, the intersection of Devore Road and ramp terminal "D1" and "D2" Lines has a vertical grade of 7.05 percent. 4 percent or less is required.

At location 2, The intersection of Kenwood Avenue and ramp terminal "K1" and "K2" Lines is within a 200' Vertical Curve (VC) with G1=10.14 percent and G2=8.27 percent. 4 percent grade or less is required.

At location 3, the intersection of Kenwood Avenue and ramp terminal "K3" and "K4" Lines has a vertical grade of 10.1 percent. 4 percent or less is required.

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 504.3 (3) - Location and Design of Ramp Intersections on the Crossroad.
"Ramp terminals should connect where the grade of the overcrossing is 4 percent or less to avoid potential overturning of trucks."

Reasons for Requesting Exception:
There are three locations where this design feature is not achieved, the northbound Devore Road ramp termini, the northbound Kenwood Avenue ramp termini and the southbound Kenwood ramp termini. These intersections all tie into existing streets with profile grades in the 7 – 10 percent range. Reconstruction of these streets to achieve a 4 percent gradient through the intersection is not practicable because of adjacent development and also because the existing roadways continue on this sustained grade for some distance. It would be extremely difficult to get back to the existing profile without substantially exceeding the existing gradient of these two roadways. Gradients in excess of 10 percent would be necessary for the length of the reconstruction would be excessively long, so it is proposed to not attempt the 4 percent grade at these three locations. The 3 intersections in question have existed since the freeways were constructed in the 50's and 60's. Truck traffic is not expected to use the Kenwood interchange to any degree that would impair the operational characteristics of the intersections. Truck traffic may continue to use the Devore ramps to access the FEDEX facility however the slope of Devore Rd is not ADVERSE to the left turning trucks that are expected to use this particular intersection. In this particular instance the slope of Devore Road may help the left turning truck traffic.

Added Cost to Make Standard:
The cost to make the grades standard will be cost excessive. As discussed above, improving Kenwood would technically not be feasible to flatten out the existing 10% grade to 4% and then try to make the existing grade farther north. The Devore ramp termini would be similar. In order for Devore to be standard, the adjusted Devore grade would not make the gas stations and store not accessible. The cost for Devore would be about $5,000,000. These additional costs represent 2.1 % of the total project's construction cost.

2.8. Design Exception Feature #8 - Ramps - Location and Design of Ramp Intersections on the Crossroads (Corner Sight Distance)

Nonstandard Features (refer to Attachment 12):
The "K1" Line exit ramp ends at Kenwood Avenue. The left corner sight distance is limited by the combination of the embankment slopes, curvature and downward slope of Kenwood Ave as well as the bridge columns of the "T1" Line undercrossing and the existing bridge columns of the NB I-15 undercrossing. The sight distance due to the bridge columns is 438 feet. The required distance should be 495 feet (45 mph x 7.5 sec).

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 504.3 (3) - Location and Design of Ramp Intersections on the Crossroad.
"For left-turn maneuvers from an off-ramp at an unsignalized intersection, the length of crossroads open to view should be greater than the product of the prevailing speed of vehicles on the crossroads, and the time required for a stopped vehicle on the ramp to execute a left-turn maneuver. This time is estimated to be 7½ seconds."

Reasons for Requesting Exception:
This is the northbound off ramp the K1 line at Kenwood Avenue. The 7.5 second criteria is not achievable looking to the left because the embankment slopes, bridge columns and the curvature of Kenwood Avenue. Kenwood Avenue will have -8.27% grade to the left of the NB Off Ramp. Vehicle traffic on Kenwood Avenue would be traveling up at 8.27% grade toward the I-15 NB Ramps. The proposed "T1" bridge columns are lined up with the existing NB I-15 Bridge columns and have a partial sight restriction of 438 feet. This proposed configuration for placement of the T-1 bridge columns does not make the existing situation worse. It is also anticipated that Kenwood Avenue will remain a 2-lane road keeping the current SSD in the future. In an attempt to maximize the sight distance, the off ramp intersects Kenwood Avenue at a 90 degree angle.

Added Cost to Make Standard:
The cost to make the sight distance standard will be cost excessive with the rebuilding of the NB I-15 Bridge. The added cost to make standard is estimated at $4,250,000. If temporary bridges will be necessary during the staging of this replacement, it may add another $2 million to the cost. These additional costs represent 1.8 % of the total project's construction cost.

2.9. Design Exception Feature #9– Freeway Entrances and Exits – Design Speed

Nonstandard Features (refer to Attachments 6):
The exit nose of "CD" Line is required to have a design speed of 50 mph or greater. However, the exit ramp is composed of a horizontal compound curve with a radius of 757' which correlates to a design speed of 47 mph.

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 504.2(4)(a) – Freeway Exit
"The design speed at the exit nose should be 50 miles per hour or greater for both ramps and branch connections."

Reasons for Requesting Exception:
This is the Devore off ramp which exits from the C1 connector (from NB I-15). The C1 line has an 850 feet radius. The CD line off-ramp has an 850 foot radius, compounds to a 757 feet radius immediately after the diverge which is 93 feet less than the required 850 foot radius. This is required to permit the merge with the D3 line. The design speed of this particular radius is 47 mph which slightly less than 50 mph. To achieve standard design, a considerable amount of additional bridge and roadway construction and right of way acquisition impacts on environmental habitat would be required. Making Line CD standard would require that the diverge from the I-

15, at both Line CD and Line C1, be relocated further south. This would require a widening of about 35 feet of the Cajon Creek Bridge and a widening of about 12 feet of the railroad bridge located further south. Additionally, this would extend out the right of way acquisition approximately 40 to 50 feet.

Added Cost to Make Standard:
The cost to make the Devore off ramp standard requires that the diverge with I-15 both Line CD and Line C1 be relocated further south. As a result, Line CD and C1 will need a separate bridge from the I-15 mainline Cajon Creek Br Rt. Additional right of way will also be taken. The added cost to make standard is estimated at $6,200,000. These additional costs represent 2.6 % of the total project's construction cost.

2.10. Design Exception Feature #10– Freeway-to-Freeway Connections – Design Speed

Nonstandard Features (refer to Attachments 8, 9, 14 & 15):
The horizontal existing curve along "C2" Line between station 856+42.14 and station 872+73.31 has a radius of 650 feet, which correlates to a design speed of 43 mph. The minimum standard design speed of 50 mph would then require a radius of 850 feet.

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 504.4(2) – Design Speed
"The design speed for single lane directional and all branch connections should be minimum of 50 miles per hour. When smaller radius curves, with lower design speeds, are used the vertical sight distance should be consistent with approaching vehicle speeds".

Reasons for Requesting Exception:
The northbound I-215 to southbound I-15 connector, the C2 line, is an existing connector with a design speed of 43 mph. This connector is not being proposed for reconstruction because it is the lowest level of a three level interchange. Reconstructing this connector to achieve a 50mph design speed would require a complete reconstruction of the interchange. It would affect right of way and environmental area adjacent to the freeway. It is proposed to keep this alignment because it has a relatively small demand for traffic in the future and the existing connector has a low accident rate compared to the statewide average. The existing accident rate of 0.45 compared to the average of 0.80 is significantly lower. This connector will be widened to accommodate a second lane to allow for slow vehicles to be passed. The proposed improvement in this area is not expected to have an adverse effect of the accident rate. The improvements are expected to enhance the operation of the connector.

Added Cost to Make Standard:
The cost to make standard includes realignment under existing roads, new pavement and new structures. The structures that will need to be replaced included Cajon Creek Bridge Lt, Center Connector Bridge, West Connector Bridge, and widening on Devore Overhead Left. The added cost to make standard is estimated at $29,400,000. These additional costs represent 12.2 % of the total project's construction cost.

3. TRAFFIC DATA

A Traffic Operation Analysis was performed to study the existing traffic conditions (Year 2007), forecast future traffic demand (Year 2040) and assess the impact on traffic conditions of the proposed improvements. Detailed methodologies and analysis results can be referenced in the draft Traffic Operations Analysis report dated December 18, 2009.

The current and projected Average Daily Traffic volumes for this project are shown in Table 1:

Table 1: Existing and Forecasted ADT Volumes

Freeway Segment	ADT		
	2007	2017	2040
I-15 Northbound			
Sierra Ave On Ramp to Glen Helen Pkwy Off Ramp	55,500	81,200	140,400
Glen Helen Pkwy On Ramp to I-215 SB Connector	53,600	78,200	134,600
I-215 SB Connector	8,800	10,000	12,600
I-215 SB Connector to I-215 NB Connector	44,800	68,200	122,000
I-215 NB Connector to Kenwood Ave Off Ramp	66,100	103,000	188,000
Kenwood Ave On Ramp to North of Kenwood Ave	64,900	103,000	190,700
I-15 Southbound			
North of Kenwood Ave to Kenwood Ave On Ramp	70,400	106,000	187,900
Kenwood Ave On Ramp to I-215 SB Connector	71,600	107,800	191,100
I-215 SB Connector to I-215 NB Connector	50,400	73,200	125,600
I-215 NB Connector to Glen Helen Pkwy Off Ramp	59,200	82,600	136,400
Glen Helen Pkwy On Ramp to Sierra Ave Off Ramp	58,100	83,800	143,000
I-215 Northbound			
University Pkwy On Ramp to Palm Avenue	29,600	44,000	77,000
Palm Ave On Ramp to Devore Rd Off Ramp	28,400	43,400	78,000
I-15 SB Connector	8,800	9,400	10,800
I-15 NB Connector	21,300	34,800	65,900
I-215 Southbound			
Connector from I-15 SB	21,300	34,700	65,400
CD On Ramp to Palm Ave Off Ramp	31,400	46,200	80,400
Palm Ave On Ramp to University Pkwy Off Ramp	30,100	45,000	79,100

Table 2 shows the projected (Year 2040) AM and PM peak hour traffic volumes and percent of trucks for the I-15 freeway mainline between the adjacent interchanges and the ramps.

Table 2: Year 2040 I-15 Mainline and Ramp Peak Hours Volumes

Freeway Segment	2040			
	AM		PM	
	Volume vph	Trucks %	Volume vph	Trucks %
I-15 Northbound				
Sierra Ave On Ramp to Glen Helen Pkwy Off Ramp	5,898	12%	8,862	13%
Glen Helen Pkwy Off Ramp	194	7%	473	5%
Glen Helen Pkwy Off Ramp to Glen Helen Pkwy On Ramp	5,704	12%	8,392	14%
Glen Helen Pkwy On Ramp	104	1%	488	6%
Glen Helen Pkwy On Ramp to I-215 NB Connector	5,808	12%	8,880	13%
I-215 SB Connector	820	3%	793	7%
I-215 SB Connector to I-215 NB Connector	4,988	14%	8,086	14%
I-215 NB Connector	2,943	10%	5,490	5%
I-215 NB Connector to Kenwood Ave Off Ramp	7,931	12%	13,576	10%
Kenwood Ave Off Ramp	79	23%	309	7%
Kenwood Ave Off Ramp to Kenwood Ave On Ramp	7,851	12%	13,267	10%
Kenwood Ave On Ramp	20	30%	794	6%
Kenwood Ave On Ramp to North of Kenwood Ave	7,871	12%	14,061	10%
I-15 Southbound				
North of Kenwood Ave to Kenwood Ave On Ramp	14,452	9%	11,119	11%
Kenwood Ave Off Ramp	584	14%	11	27%
Kenwood Ave Off Ramp to Kenwood Ave On Ramp	13,869	8%	11,108	11%
Kenwood Ave On Ramp	210	6%	90	10%
Kenwood Ave On Ramp to I-215 SB Connector	14,079	8%	11,198	11%
I-215 SB Connector to I-215 NB Connector	8,385	12%	7,099	14%
I-215 NB Connector	657	9%	695	4%
I-215 NB Connector to Glen Helen Pkwy Off Ramp	9,042	11%	7,794	13%
Glen Helen Pkwy Off Ramp	152	14%	64	6%
Glen Helen Pkwy Off Ramp to Glen Helen Pkwy On Ramp	8,890	11%	7,730	13%
Glen Helen Pkwy On Ramp	535	7%	190	13%
Glen Helen Pkwy On Ramp to Sierra Ave Off Ramp	9,424	11%	7,920	13%

Table 3 shows the projected (Year 2040) AM and PM peak hour traffic volumes and percent of trucks for the I-215 freeway mainline between the adjacent interchanges and the ramps.

Table 3: Year 2040 I-215 Mainline and Ramp Peak Hours Volumes

Freeway Segment	2040			
	AM		PM	
	Volume vph	Trucks %	Volume vph	Trucks %
I-215 Northbound				
University Pkwy On Ramp to Palm Ave Off Ramp	3,711	9%	6,713	5%
Palm Ave Off Ramp	871	3%	1,143	1%
Palm Ave Off Ramp to Palm Ave On Ramp	2,840	11%	5,571	6%
Palm Ave On Ramp	453	3%	613	2%
Palm Ave On Ramp to Devore Rd Off Ramp	3,293	10%	6,184	5%
Palm Ave Off Ramp	150	5%	235	13%
Palm Ave Off Ramp to Devore Rd On Ramp	3,143	10%	5,949	5%
Palm Ave On Ramp	457	10%	236	3%
Palm Ave On Ramp to I-15 SB Connector	3,600	10%	6,185	5%
I-15 SB Connector	657	9%	695	4%
I-15 NB Connector	2,943	10%	5,490	5%
I-215 Southbound				
I-215 Connector from I-15 SB	5,694	4%	4,101	6%
CD Off Ramp	158	5%	85	6%
CD Off Ramp to CD On Ramp	5,536	3%	4,016	6%
CD On Ramp	935	5%	447	3%
CD On Ramp to Palm Ave Off Ramp	6,471	4%	4,462	6%
Palm Ave Off Ramp	784	2%	275	6%
Palm Ave Off Ramp to Palm Ave On Ramp	5,688	4%	4,187	6%
Palm Ave On Ramp	1,061	2%	963	2%
Palm Ave On Ramp to University Pkwy Off Ramp	6,749	4%	5,151	5%

4. ACCIDENT ANALYSIS

Traffic Accident Surveillance and Analysis System (TASAS) data was provided by Caltrans District 8, which includes accidents that occurred between October 01, 2005 and September 30, 2008 on the I-15 and I-215 freeway from PM12.5 to R19.5 and PM 14.00 to 17.75 respectively including the interchange ramp areas for a period of three years. Table 4 shows the accident rate at the adjacent interchanges and the mainline segment within the study area.

Table 4: TASAS – Accident Rate from 10/01/2005 to 09/30/2008

Location	Feature #	Alignment Line #	Actual (Per MVM for mainline, per MV for ramp)			Average (Per MVM for mainline, per MV for ramp)		
			Fatal	F + I	Total	Fatal	F + I	Total
Route 15 Mainline:								
Mainline, NB from PM 12.500 to 16.373	4-1,5-1, 5-3, 5-4	A1,A2	0.003	**0.43**	**1.31**	0.010	0.27	0.79
Mainline, SB from PM 12.500 to 16.373	1, 2, 4-1	A1, A3	0.003	0.19	0.72	0.010	0.27	0.79
Mainline, NB from PM R14.273 to R16.40		A2	**0.011**	**0.30**	**0.79**	0.008	0.23	0.65
Mainline, SB from PM R14.048 to R16.40	2	A3	**0.015**	**0.54**	**1.50**	0.008	0.23	0.65
Mainline, NB from R13.799 to R14.275 *		B2	**0.024**	0.27	0.51	0.011	0.29	0.84
Mainline, SB from R13.799 to R14.048 *	2, 3, 10	B3	0.000	0.28	0.69	0.014	0.35	1.00
Route 15 Ramps:								
NB Off to Glen Helen Pkwy, PM 14.565			0.000	**1.75**	**5.97**	0.007	0.37	1.20
SB On from Glen Helen Pkwy, PM 14.587			0.000	**0.96**	**0.96**	0.004	0.18	0.60
SB Off to Glen Helen Pkwy, PM 14.996			0.000	0.00	0.00	0.007	0.37	1.20
NB On from Glen Helen Pkwy, PM 15.008			0.000	0.00	**4.56**	0.004	0.18	0.60
NB Off to SB I-215, PM 16.137	9, 5-5	C1	0.000	0.00	0.00	0.003	0.10	0.30
SB Off to SB I-15, PM R14.048 **	2	A3	0.000	0.05	0.10	0.003	0.10	0.30
NB On from NB I-15, PM R14.273 **		A2	0.000	0.03	0.08	0.005	0.20	0.60
SB On from Kenwood Ave, PM R14.787	7-3	K4	0.000	**0.63**	**0.63**	0.004	0.18	0.60
NB Off to Kenwood Ave, PM R14.806	7-2, 8	K1	0.000	**0.67**	**1.34**	0.007	0.37	1.20
SB Off to Kenwood Ave, PM	5-2, 7-3	K3	0.000	**7.72**	**15.44**	0.007	0.37	1.20

Location	Feature #	Alignment Line #	Actual *(Per MVM for mainline, per MV for ramp)*			Average *(Per MVM for mainline, per MV for ramp)*		
			Fatal	**F + I**	**Total**	**Fatal**	**F + I**	**Total**
R15.200								
NB On from Kenwood Ave, PM R15.210	7-2	K2	0.000	0.00	0.00	.004	0.18	0.60
Route 215 Mainline:								
Mainline, NB from PM 14.00 to 17.753	4-2	B1, B2	0.000	0.17	0.66	0.010	0.29	0.90
Mainline, SB from PM 14.00 to 17.753	4-2	B1,B3	**0.028**	**0.50**	**0.99**	0.010	0.29	0.90
Route 215 Ramps:								
SEG SB On from Cajon Blvd, PM 17.075			0.000	**0.77**	**1.54**	0.004	0.23	0.70
NB Off to Devore Rd, PM 17.146	6, 7-1	D1	0.000	**0.68**	**1.37**	0.004	0.42	1.20
NB On from Devore Rd, PM 17.253	6, 7-1		**0.318**	**0.32**	**2.55**	0.008	0.16	0.55
NB Off to SB I-15, PM 17.489	3, 10	C2	0.000	**0.29**	0.49	0.007	0.26	0.80
SEG SB Off to Cajon Blvd, PM 17.654		D3	0.000	**1.19**	**5.95**	0.004	0.23	0.70

* TASAS identifies this as part of the I-15 'mainline', however it is actually a portion of the northbound and southbound I-215 connectors.

** TASAS identifies this as a 'ramp' to the freeway but actually it is the I-15 'mainline' northbound and southbound.

Note: **BOLD** # Indicate actual is higher than the statewide average.

TASAS-TSN data indicates that the accident actual total rate, when compared to the statewide average at the adjacent interchanges, at similar facilities, is higher at (9) nine locations along Route 15 and (5) five locations along Route 215. The PROJECT is expected to reduce congestion on Interstate 15 and 215 thereby reducing the accident rates in the area.

The accident rates for various sections of the state highways are above and below the statewide average for similar facilities. This discussion will look into the higher accident rates to identify the possible causes and corrective actions this project can implement to reduce these accident rates.

The northbound I-15 from PM 12.5 to 16.3 has accident rates higher than the statewide average. This is the location where the freeway narrows from 4 to 3 lanes and there is recurring congestion typically in the evenings. This project will add 1 to 2 lanes within this area to reduce congestion. A similar reduction in the accident rate is anticipated.

The northbound I-15 from PM R14.2 to R16.4 has accident rates higher than the statewide average. This is the location where the freeway merges with lanes from I-215. Northbound trucks from I-215 must weave across the I-15 lanes to reach the slow lanes. There is also a non standard weaving distance to the Kenwood off-ramp. It is believed that many of the accidents in this area are related to these weaving / merging maneuvers. This project will construct northbound truck bypass lanes in all of the alternatives, which will eliminate the truck weaving maneuver and the congestions related to it. The northbound Kenwood off-ramp will only be accessible from the truck bypass, thus eliminating the non standard weaving section. A similar reduction in the accident rate is anticipated.

The southbound I-15 from PM R14.0 to R16.4 has an accident rate higher than the statewide average. This is in the location where 2 auxiliary lanes are added prior to I-15 diverging from the mainline on the right side. There is also a non-standard weaving area between the SB Kenwood on-ramp and the I-215 diverge on the left creating a short weaving area for the number of lanes which need to be crossed to access the I-215 connector. It is believed that the substantial number of lane changes associated with I-15 traffic staying on I-15 is causing congestion in this area and contributes to the higher accident rates. Alternatives 2, 3 & 3A resolve the issue associated with I-15 diverging on the right side. In these three alternatives, route continuity is provided with the I-215 traffic diverging on the right and I-15 auto traffic staying in the left 3 lanes. The SB Kenwood on-ramp cannot access I-215 in these configurations also eliminating the non standard weave. In alternative 5, the basic configuration of the I-15 diverging on the right is maintained and so is the Kenwood on-ramp and the short weaving section. Alternative 5 does provide a SB truck bypass to I-215 which will remove the SB trucks from the weaving area. The length of the auxiliary lanes is made standard providing a longer distance for vehicles to make the needed lane changes prior to the truck bypass and the I-215 connector. These designs are anticipated to reduce the accident rate in this area.

The northbound off and on-ramps at Glen Helen Parkway have higher accident rates than similar facilities statewide. It is believed that this has the same cause as does the I-15 mainline in this area where the #4 lane northbound is forced off at Glen Helen Parkway.

The northbound off-ramp at Kenwood Ave has a slightly higher accident rate than similar facilities statewide. It is believed that this has the same cause as does the I-15 mainline in this area where there is a congested weaving area. The reconfiguration of the off-ramp from the truck bypass lanes is expected to reduce the accident rate for the ramp.

The southbound Kenwood off-ramp has an accident rate higher than the statewide average. This high rate (15.44 vs. 1.2) can be attributed to only a few accidents on a relatively low volume ramp. These accidents mostly involve trucks descending Cajon Pass and experiencing what appear to be related to brake failure, or the inability to stop at the ramp termini.

The SB I-215 mainline has an accident rate slightly higher than the average. Improvements in this area will add a 3rd lane and a wider left shoulder. These improvements should improve the situation.

The SB I-215 collector–distributor road (PM 17.075 and 17.654) has accident rates higher than the statewide average for a similar facility. This collector-distributor road has a very short weaving section where traffic from the NB 15 connector cross SB I-215 traffic headed to the Devore Rd off-ramp. This off-ramp also has a tight radius 'hook' configuration. The southerly end of this weaving section also has a crest vertical curve with limited sight distance. These 3 factors contribute to the high accident rate in Alternatives 2, 3 & 3A the weaving section is eliminated by use of various braiding configurations. In Alternative 5 a weaving section is provided along the Truck bypass which is about 5 times longer than the existing weaving area. In all alternatives hook ramps are

moved further south, a larger radius is provided and a longer deceleration distance provided prior to the first curve. All of these proposed designs are expected to reduce the accident rate along this section of freeway.

The northbound I-215 off and on-ramps at Devore Rd have accident rates higher than the statewide average. The non-standard geometric configuration of the ramps may be contributing factors to this. The on-ramp has a compound curve ending in a very tight loop merge with high speed auxiliary lanes and weaving area immediately prior to the connector to SB I-15. All alternatives eliminate the loop on-ramp to NB I-215 as well as the short auxiliary lane. Alternatives 2 and 5 provide standard hook on-ramps further south. Alternative 3 and 3A provide direct ramp to NB I-215.

5. INCREMENTAL IMPROVEMENTS

The designs proposed already incorporate as much of incremental improvements as possible. There are no additional incremental improvements possible without providing the full standards as outlines in each feature.

6. FUTURE CONSTRUCTION

This project is compatible with the proposed I-15 ultimate facility currently under study by SANBAG and Caltrans. The Route Concept Fact Sheet dated 1999, only addresses ultimate facility as being an 8+2 freeway. The I-15 Corridor Feasibility Study has three conceptual elements for the ultimate facility. When finally approved, these features will be incorporated into the new Route Concept Report currently being updated by Caltrans. The three elements being considered are:

- Add two HOV lanes (traditional widening adjacent to #1 lane)
- Construct 'Managed' lanes (similar to the reversible lanes in San Diego on I-15)
- Construct barrier separated "Truck Only" Lanes.

The managed lane concept could be 2, 3 or 4 lanes wide with or without a movable barrier to reconfigure the number of lanes in the heavier direction of travel. Reversible use of these lanes would favor the heaviest demand direction. The HOV and Managed lanes can be accommodated in the median of the south leg of I-15. The truck lane concept takes up the most width which would require outside widening of the south leg of I-15. The north leg of I-15 presents a challenge to this project because it is unknown which alternative will be selected for the corridor. The northbound and southbound roadbeds are on independent profiles and are separated vertically by up to15 feet. Addition of any lanes in the median will require extensive use of retaining walls for several miles.

An optional configuration on this leg would be to construct a 3rd roadbed on an independent profile further up the side of the hill, easterly of the northbound lanes. This new roadbed could be used for either the northbound mainline or the new 'managed' or 'truck' lanes. The existing northbound roadbed might be used for the managed/truck lanes if the northbound auto traffic uses the new roadbed. Close coordination with the corridor project will be needed as final design approaches.

The I-215 corridor also needs to be considered in these designs as it has not been built to its ultimate width which is 8 MF lanes + 2 HOV lanes. The August 1999 Route Concept Fact sheet identified the need for two HOV lanes on this section of I-215 just to meet the 2015 traffic demand. A revised Route Concept Report is being prepared by Caltrans at this time. The ultimate facility for I-215 will be considered in the development of this project.

7. PROJECT REVIEWS, CONCURRENCE

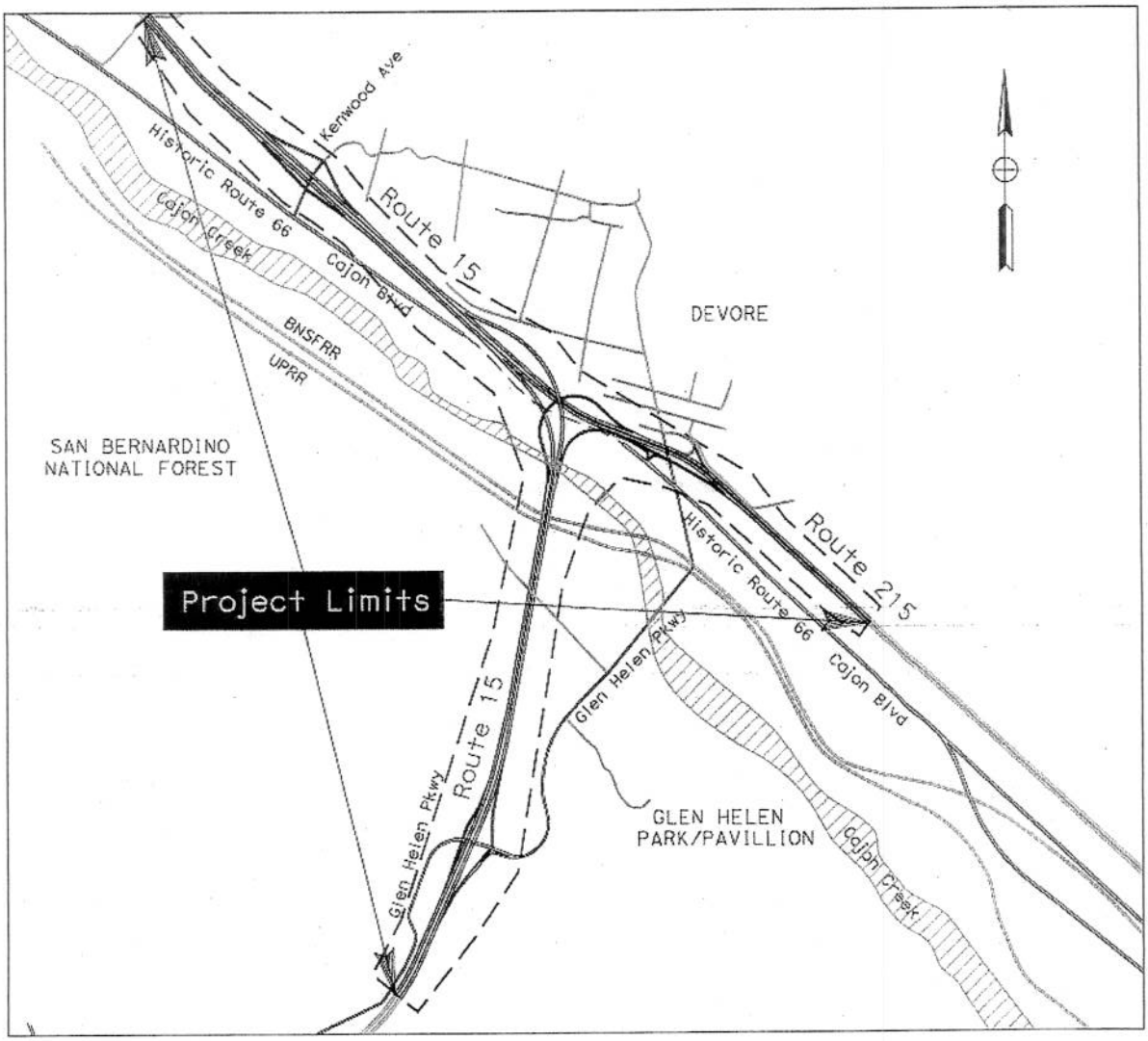
The exception has been reviewed during the Geometric Approval Drawing phase by the following individuals:

1. Anthony Ng, P.E., Design Oversight Office Chief (concurred 7/1/10, [signature])
2. Brian Frazer, P.E., Headquarters Design Reviewer (concurred 6/30/10, [signature])
3. Gideon Agra, P.E., Design Oversight Engineer (concurred 7/1/10 [signature])
4. Theresa Sasis, P.E., Traffic Operations Reviewer (concurred 7/1/10 [signature])

8. ATTACHMENTS

Attachment	**1**	-	**Location Map**	
Attachment	**2**	-	**Key Map**	
Attachment	**3**	-	**Design Exception Feature # 4**	**- (Sheet 7)**
Attachment	**4**	-	**Design Exception Feature # 4**	**- (Sheet 8)**
Attachment	**5**	-	**Design Exception Feature # 4**	**- (Sheet 9)**
Attachment	**6**	-	**Design Exception Feature # 9**	**- (Sheet 11)**
Attachment	**7**	-	**Design Exception Feature # 1 & 2**	**- (Sheet 12)**
Attachment	**8**	-	**Design Exception Feature # 3, 4,& 10**	**- (Sheet 13)**
Attachment	**9**	-	**Design Exception Feature # 2, 3 & 10**	**- (Sheet 14)**
Attachment	**10**	-	**Design Exception Feature # 2**	**- (Sheet 15)**
Attachment	**11**	-	**Design Exception Feature # 7**	**- (Sheet 23)**
Attachment	**12**	-	**Design Exception Feature # 7 & 8**	**- (Sheet 24)**
Attachment	**13**	-	**Design Exception Feature # 6 & 7**	**- (Sheet 38)**
Attachment	**14**	-	**Design Exception Feature # 4 & 10**	**- (Sheet 40)**
Attachment	**15**	-	**Design Exception Feature # 10**	**- (Sheet 41)**
Attachment	**16**	-	**Design Exception Feature # 5**	**- (Sheet SS-1)**
Attachment	**17**	-	**Design Exception Feature # 5**	**- (Sheet SS-2)**
Attachment	**18**	-	**Design Exception Feature # 1**	**- (Sheet P-1)**
Attachment	**19**	-	**Design Exception Feature # 7**	**- (Sheet P-2)**
Attachment	**20**	-	**Design Exception Feature # 3**	**- (Sheet P-3)**
Attachment	**21**	-	**Design Exception Feature # 7**	**- (Sheet P-4)**

Attachment 1
Location Map



Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0, 16.0/17.73		

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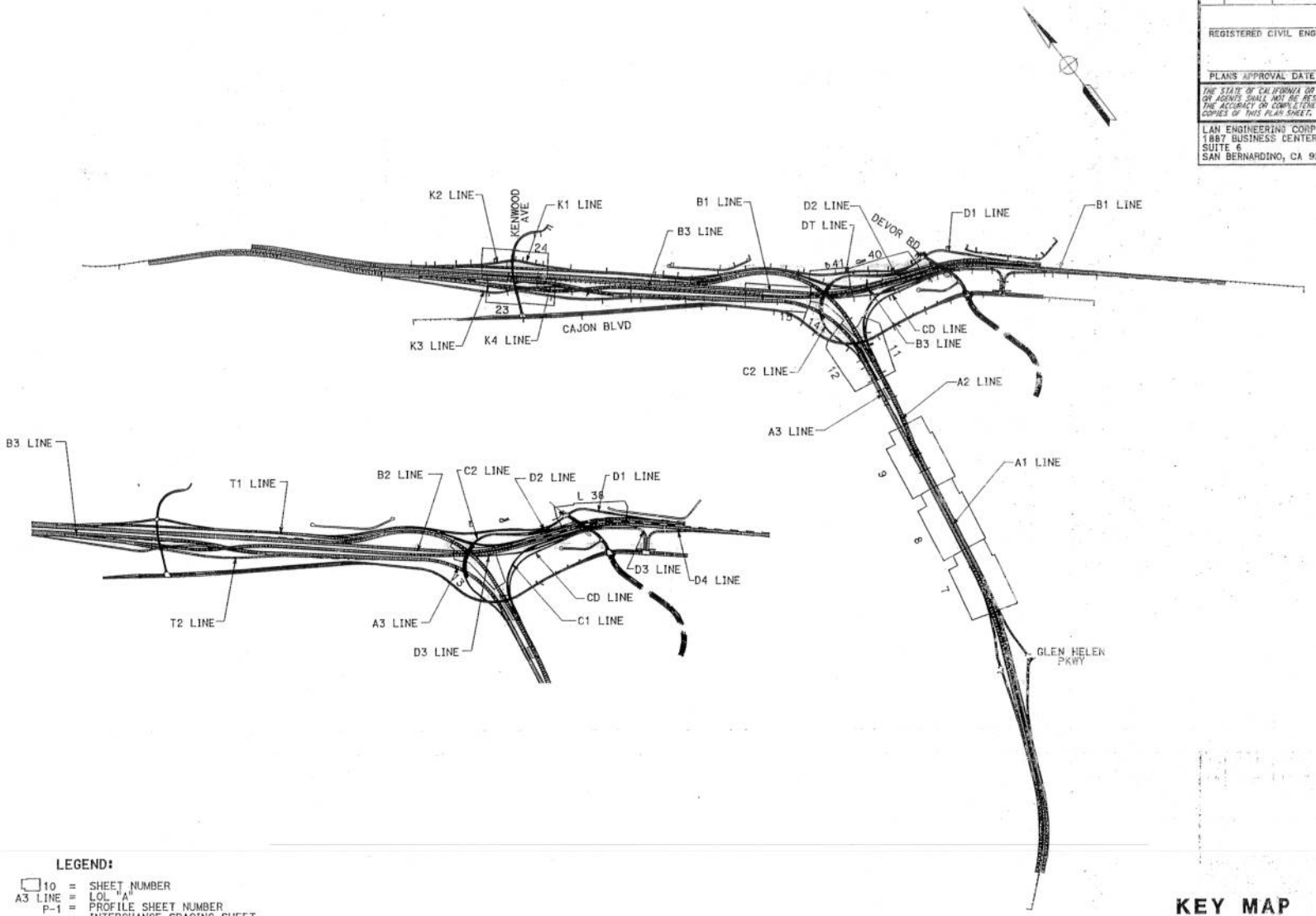

LEGEND:

10 = SHEET NUMBER
A3 LINE = LOL "A"
P-1 = PROFILE SHEET NUMBER
IC = INTERCHANGE SPACING SHEET

KEY MAP
ADVISORY
DESIGN EXCEPTION
ATTACHMENT 2

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ADVISORY DESIGN EXCEPTION FEATURES:

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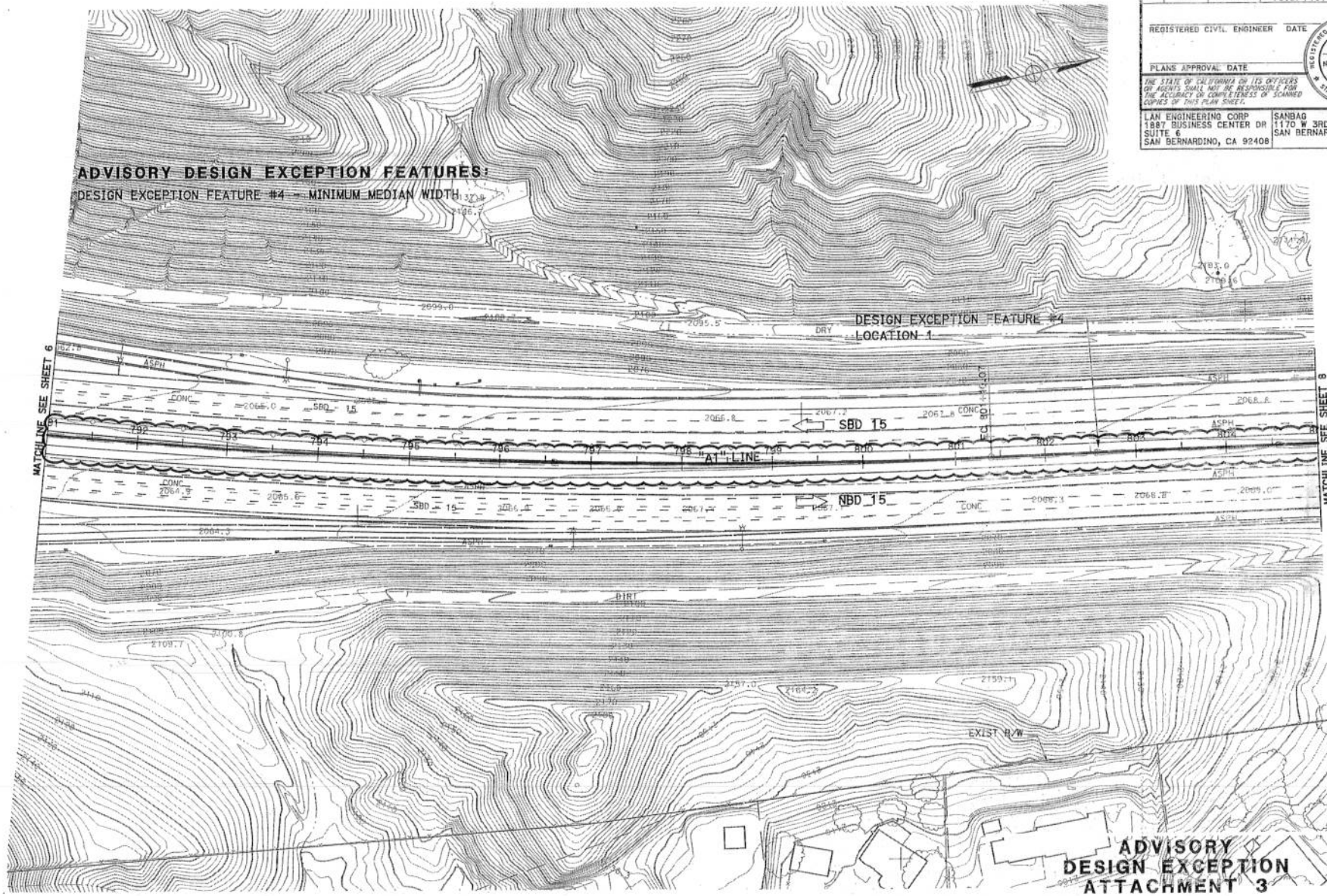

ADVISORY
DESIGN EXCEPTION
ATTACHMENT 3

SCALE: 1"=100'

SHEET 7

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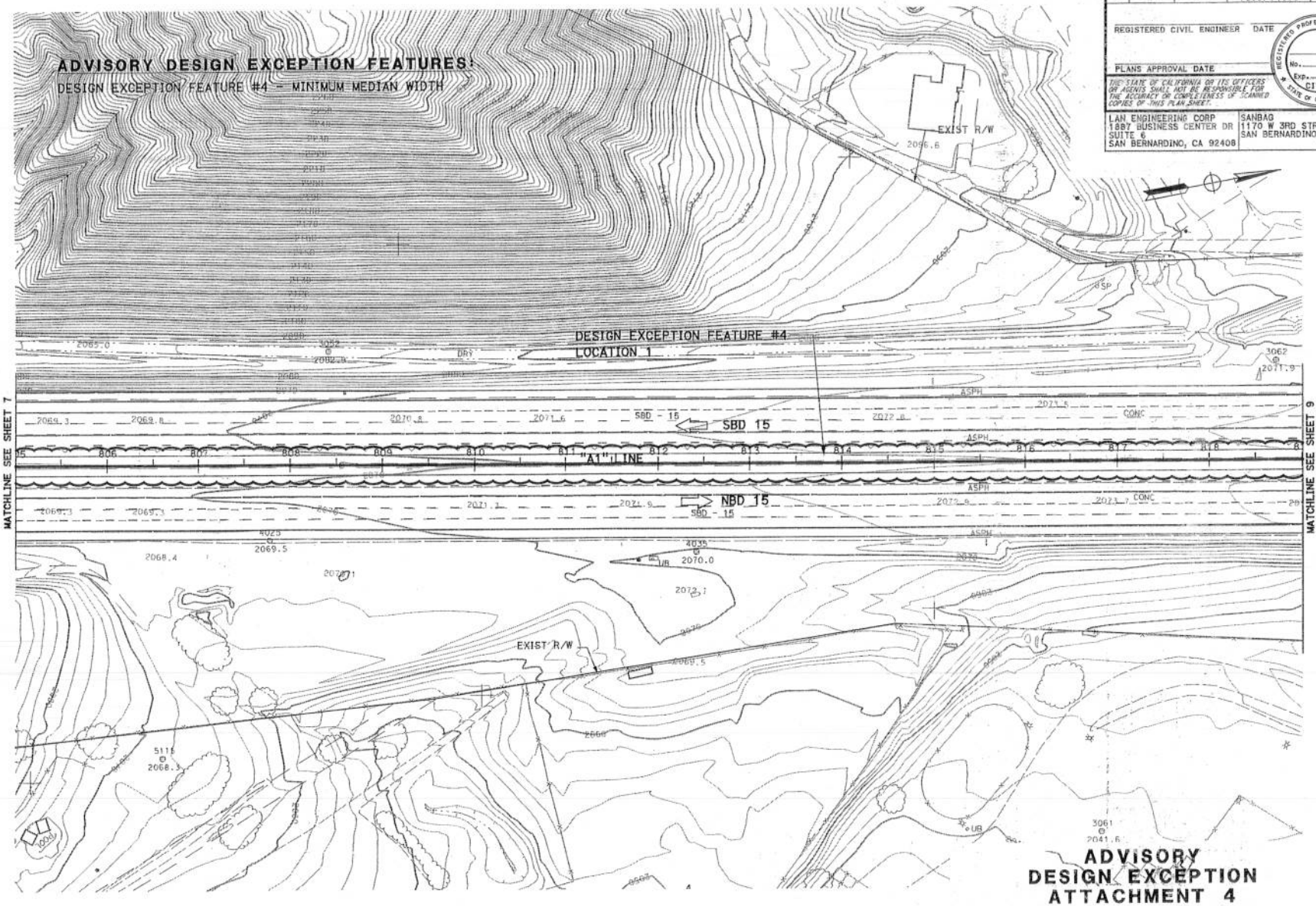

ADVISORY DESIGN EXCEPTION ATTACHMENT 4

SCALE: 1"=100'

SHEET 8

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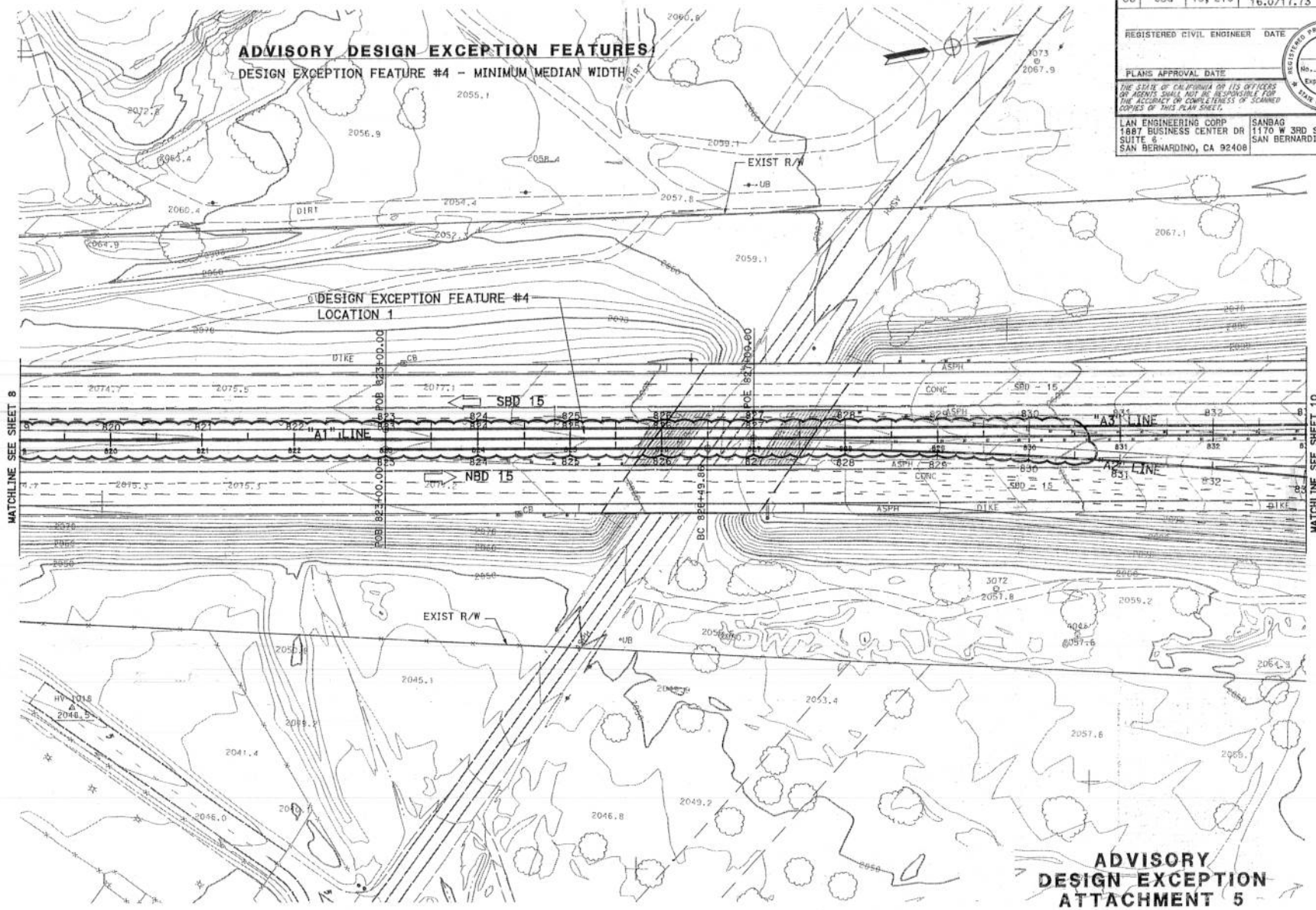

ADVISORY
DESIGN EXCEPTION
ATTACHMENT 5

SCALE: 1"=100'

SHEET 9

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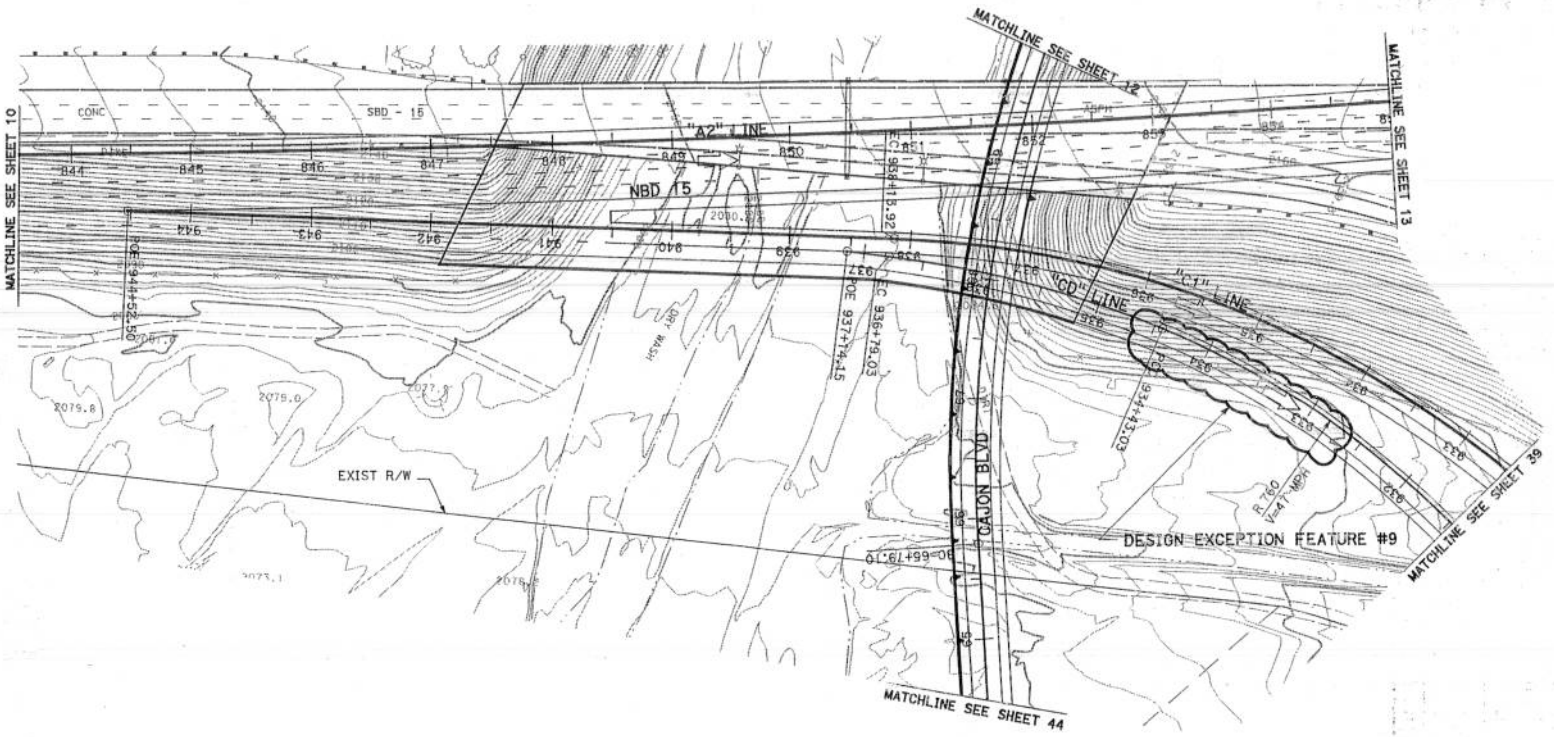
ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #9 - FREEWAY EXIT DESIGN SPEED (50 mph)



ADVISORY DESIGN EXCEPTION ATTACHMENT 6

SCALE: 1"=100'

SHEET 11

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DESIGN EXCEPTION FEATURE #2 - CURVE AT END OF LONG TANGENT EXCEEDS DESIGN SPEED OF PREVIOUS

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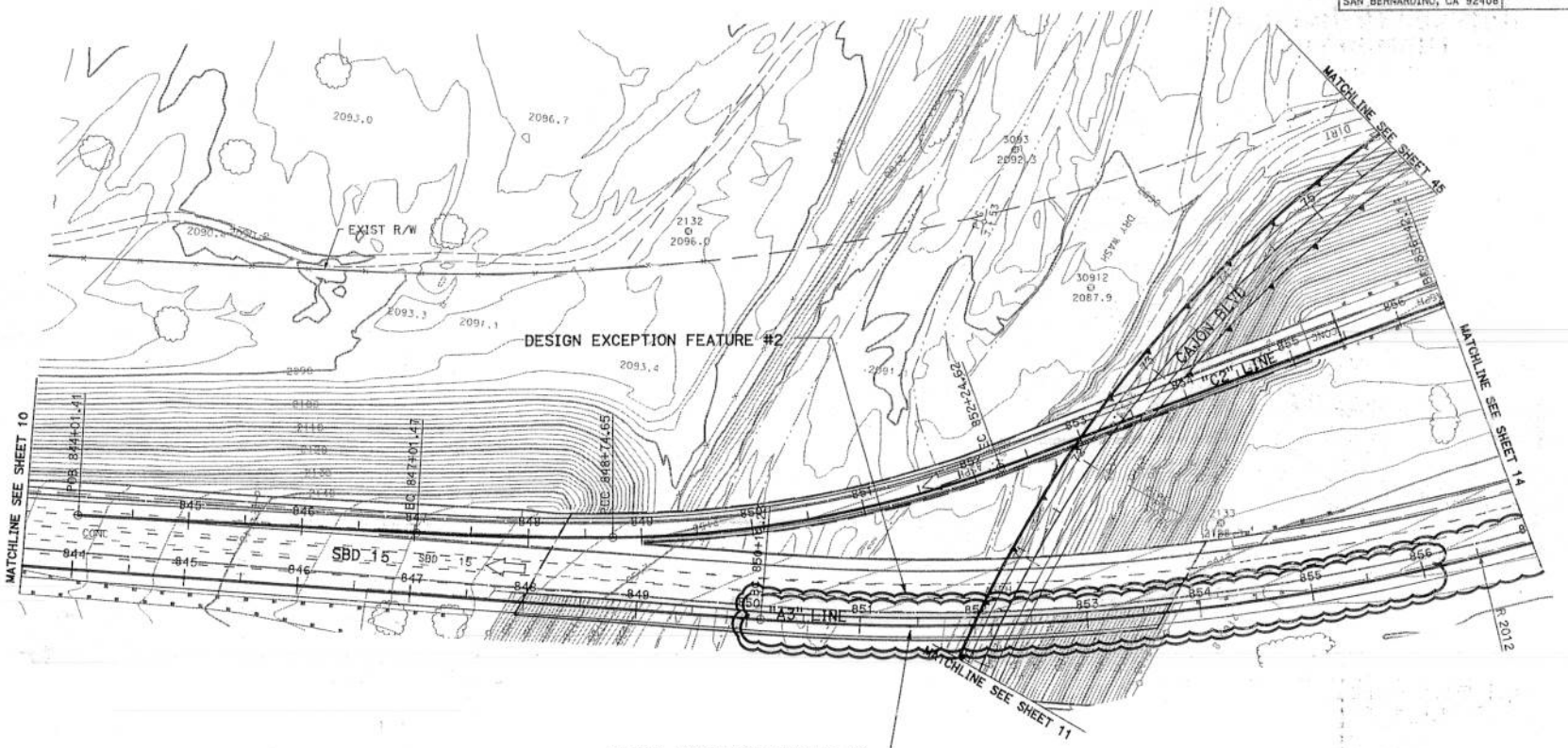

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(SEE SHEET P-1)

ADVISORY DESIGN EXCEPTION ATTACHMENT 7

SCALE: 1"=100'

SHEET 12

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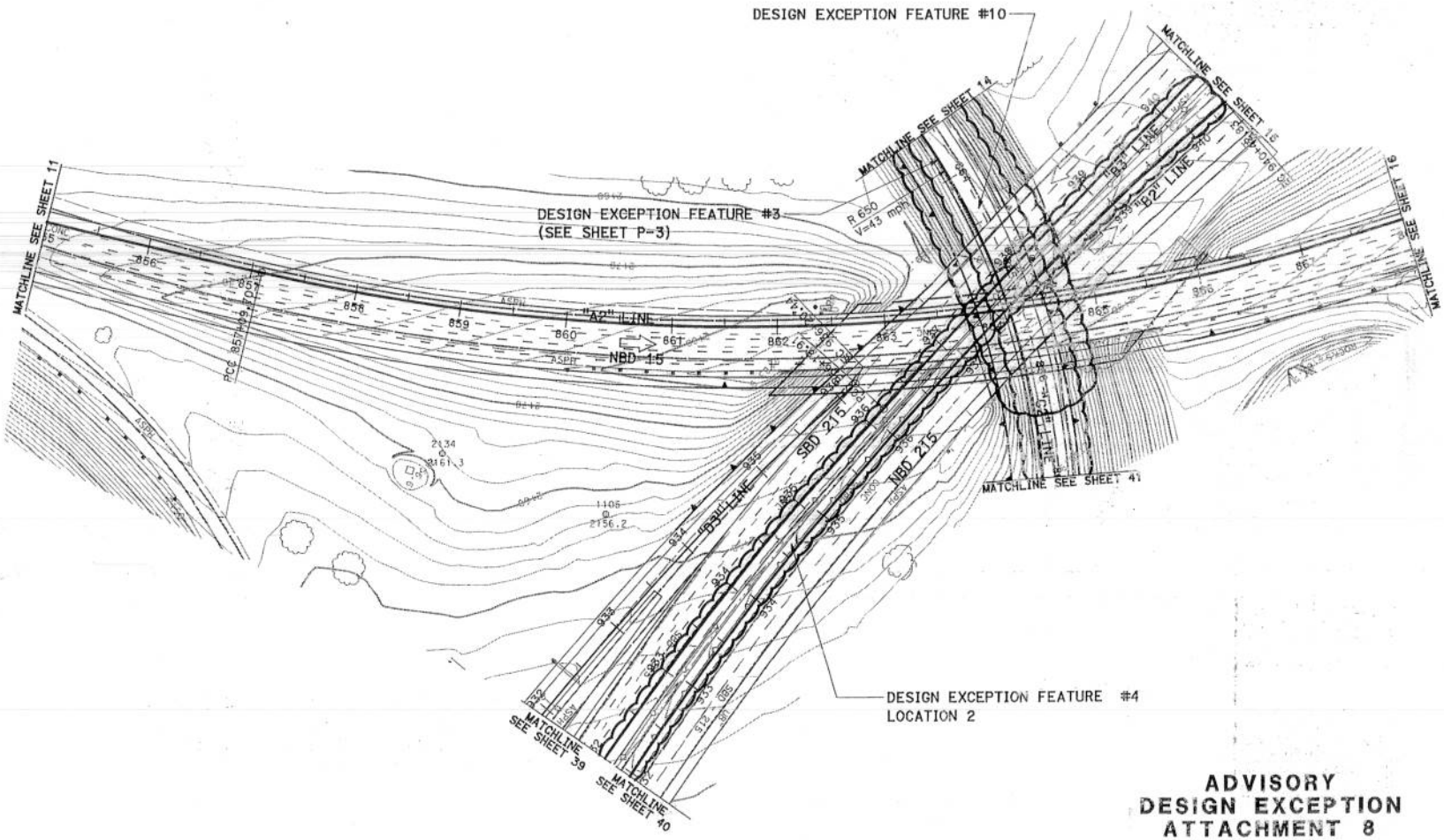
ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #3 - HORIZONTAL AND VERTICAL CURVE ALIGNMENT CONSISTENCY
DESIGN EXCEPTION FEATURE #4 - MINIMUM MEDIAN WIDTH
DESIGN EXCEPTION FEATURE #10 - FREEWAY CONNECTOR DESIGN SPEED (50 mph)



ADVISORY DESIGN EXCEPTION ATTACHMENT 8

SCALE: 1"=100'

SHEET 13

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DESIGN EXCEPTION FEATURE #10 - FREEWAY CONNECTOR DESIGN SPEED (50 mph)

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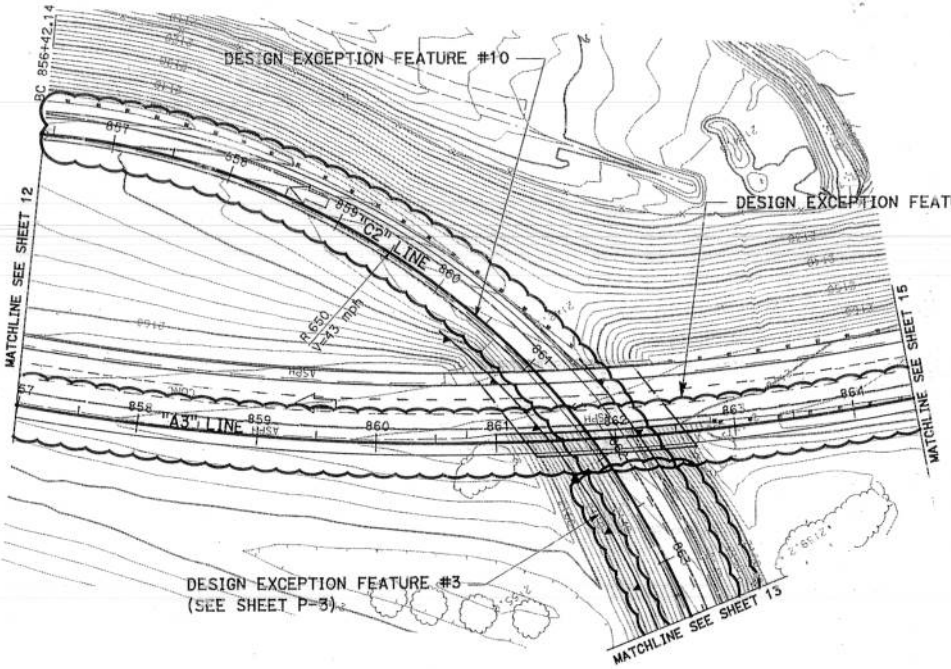

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SCALE: 1"=100'

SHEET 14

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ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - CURVE AT END OF LONG TANGENT EXCEEDS DESIGN SPEED OF PREVIOUS

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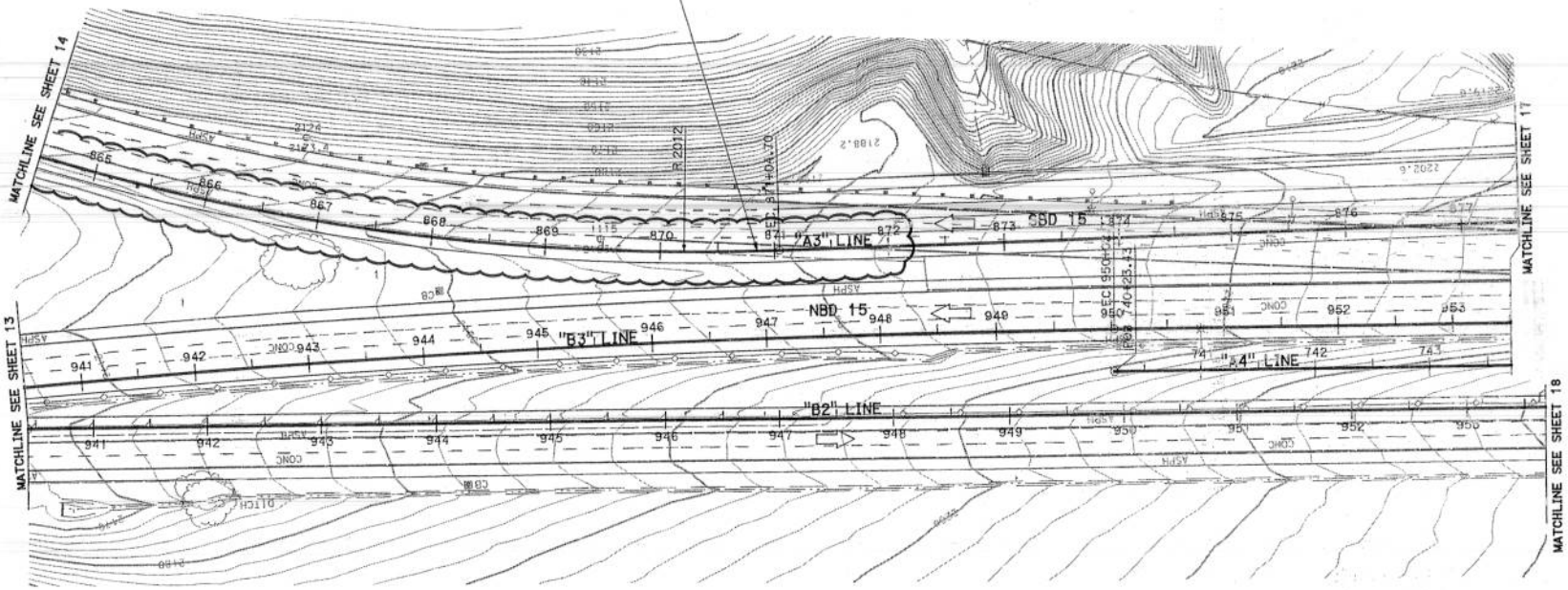
DESIGN EXCEPTION FEATURE #2



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ADVISORY DESIGN EXCEPTION ATTACHMENT 10

SCALE: 1"=100'

SHEET 15

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ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #7 - RAMP TERMINALS AND GRADE

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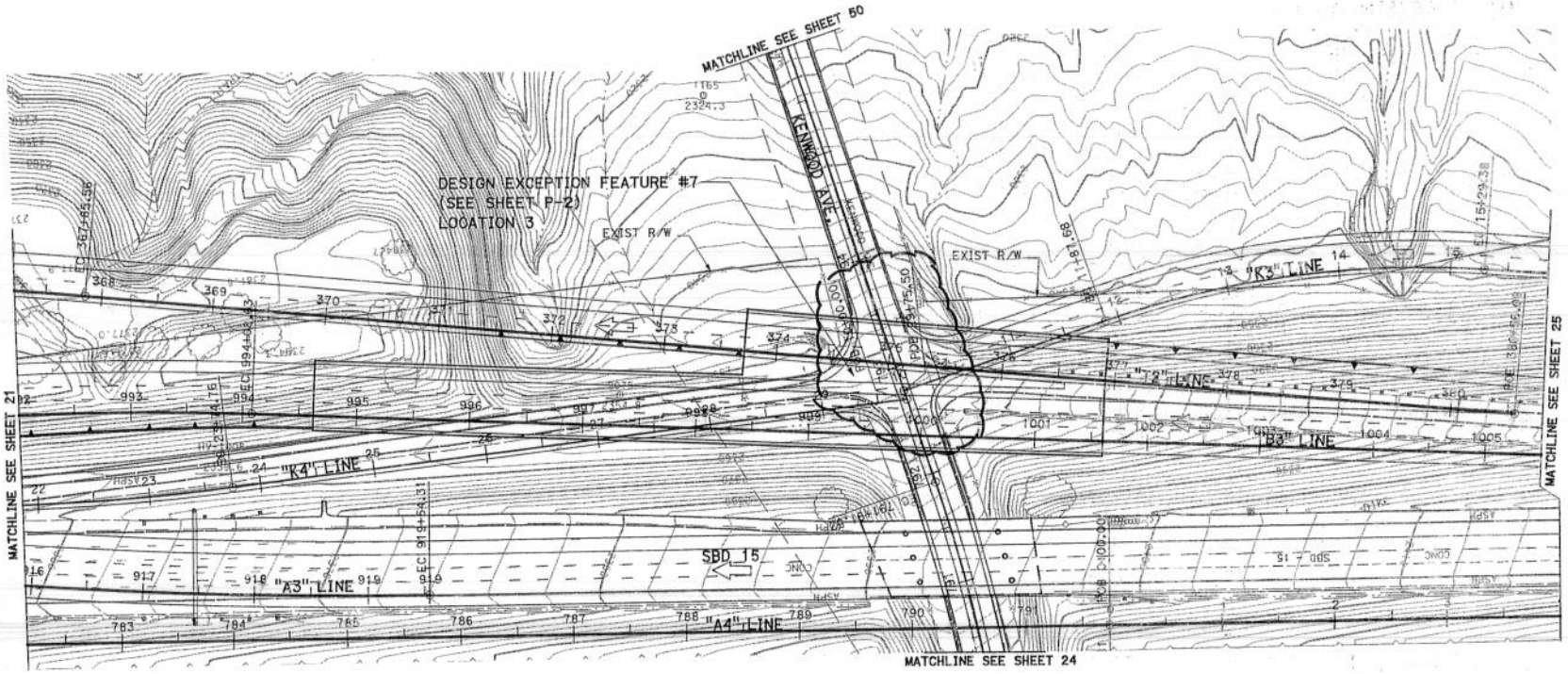

ADVISORY DESIGN EXCEPTION ATTACHMENT 11

SCALE: 1"=100'

SHEET 23

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ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #7 - RAMP TERMINALS AND GRADE
DESIGN EXCEPTION FEATURE #8 - RAMP TERMINAL SIGHT DISANCE

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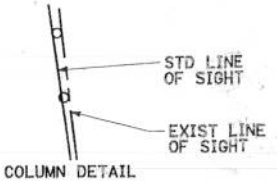
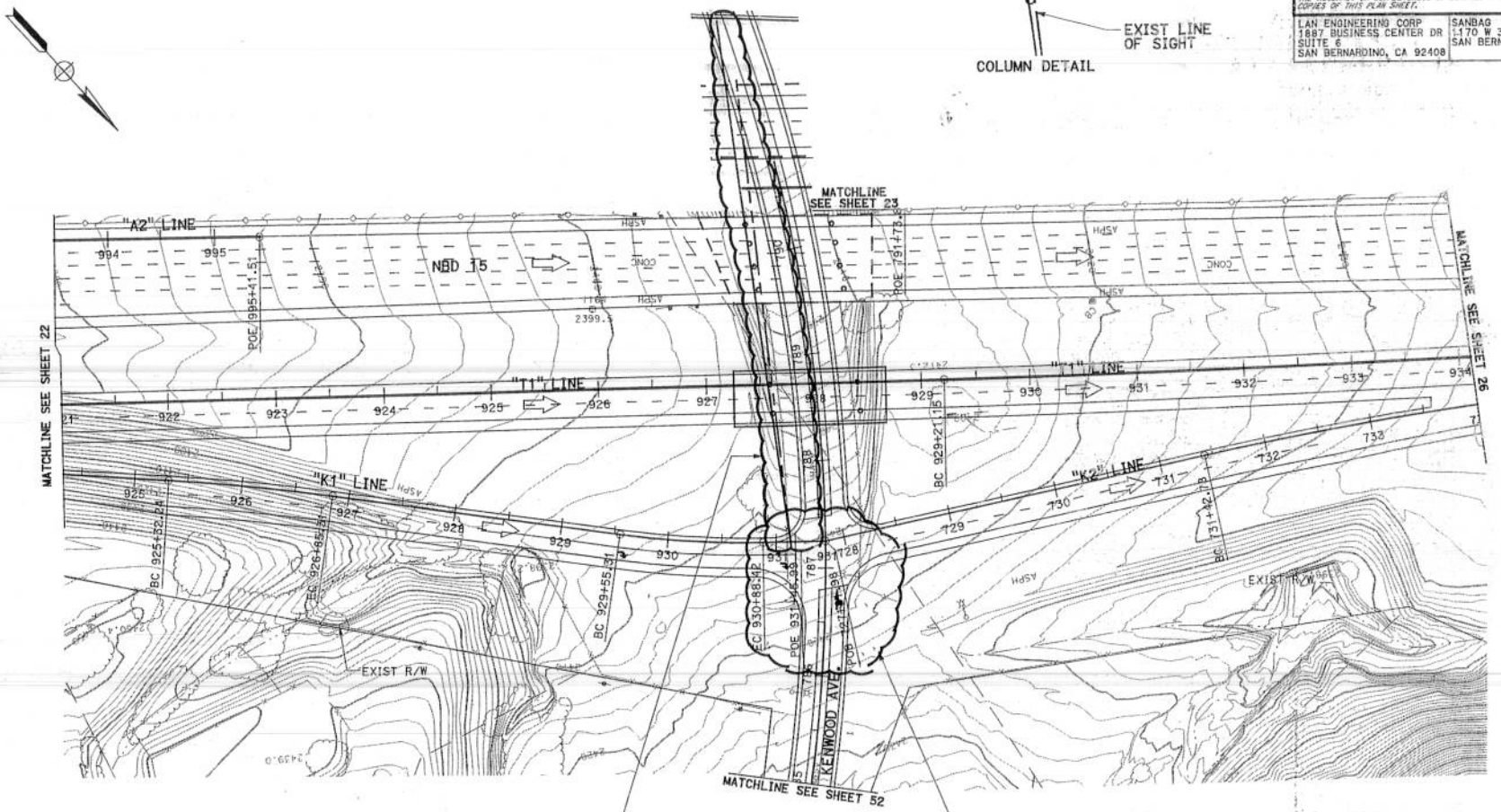


COLUMN DETAIL



DESIGN EXCEPTION FEATURE #8
L=438'
SEE COLUMN DETAIL

DESIGN EXCEPTION FEATURE #7
LOCATION 2 (SEE SHEET P-2)

ADVISORY DESIGN EXCEPTION ATTACHMENT 12

SCALE: 1"=100'

SHEET 24

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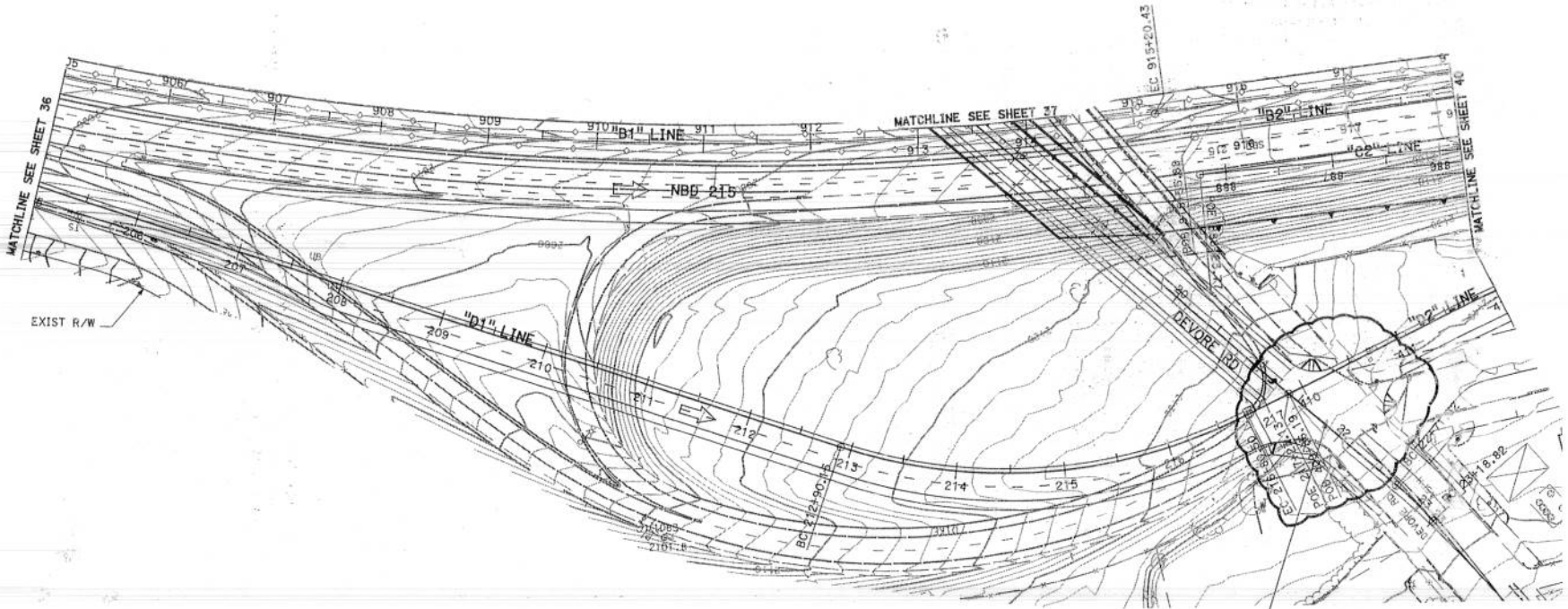
ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #6 - TWO CURB RAMPS AT EACH CORNER
DESIGN EXCEPTION FEATURE #7 - RAMP TERMINALS & GRADE



DESIGN EXCEPTION FEATURE #6 - LOCATION 1
DESIGN EXCEPTION FEATURE #7 - LOCATION 1
(SEE SHEET P-4)

ADVISORY DESIGN EXCEPTION ATTACHMENT 13

SCALE: 1"=100'

SHEET 38

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08	SBd	15, 215	13.5/16.0 16.0/17.73		

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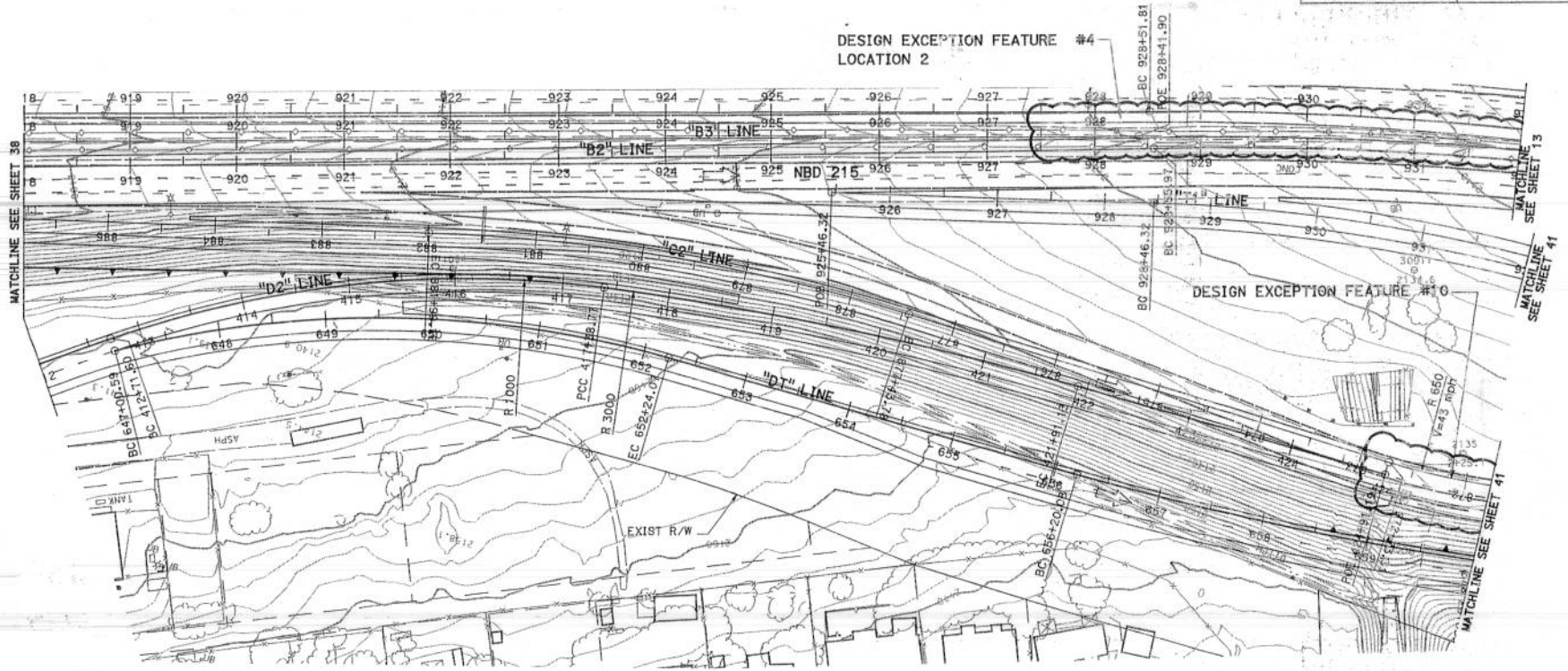
LAN ENGINEERING CORP 1887 BUSINESS CENTER DR SUITE 6 SAN BERNARDINO, CA 92408	SANBAG 170 W 3RD STREET SAN BERNARDINO, CA 92410

ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #4 - MINIMUM MEDIAN WIDTH
DESIGN EXCEPTION FEATURE #10 - FREEWAY CONNECTOR DESIGN SPEED (50 mph)



ADVISORY DESIGN EXCEPTION ATTACHMENT 14

SCALE: 1"=100'

SHEET 40

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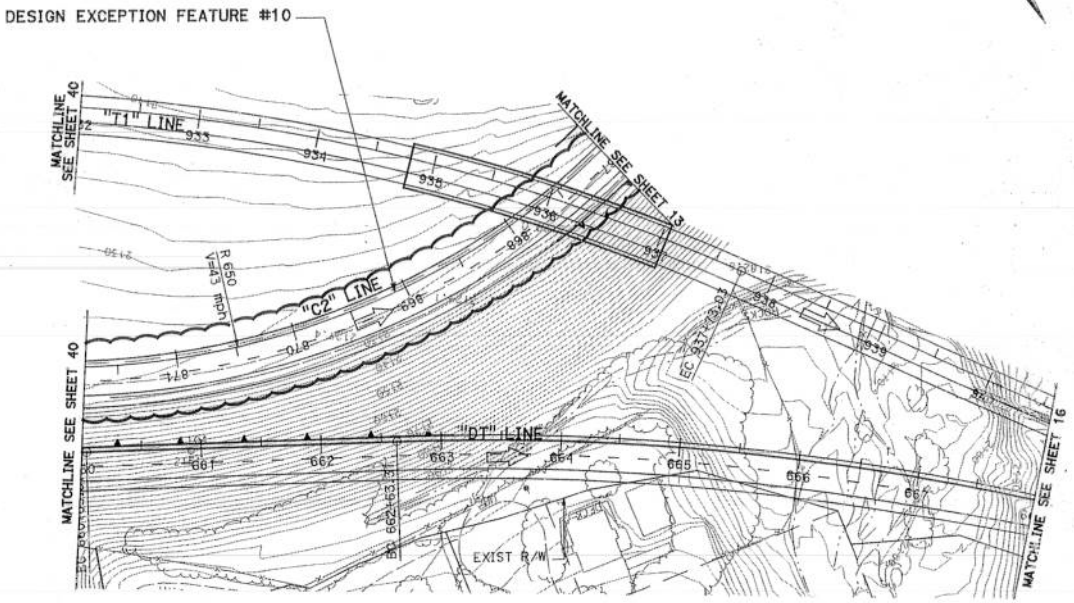
1867 BUSINESS CENTER DR
SUITE 5
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #10 - FREEWAY CONNECTOR DESIGN SPEED (50 mph)



ADVISORY DESIGN EXCEPTION ATTACHMENT 15

SCALE: 1"=100'

SHEET 41

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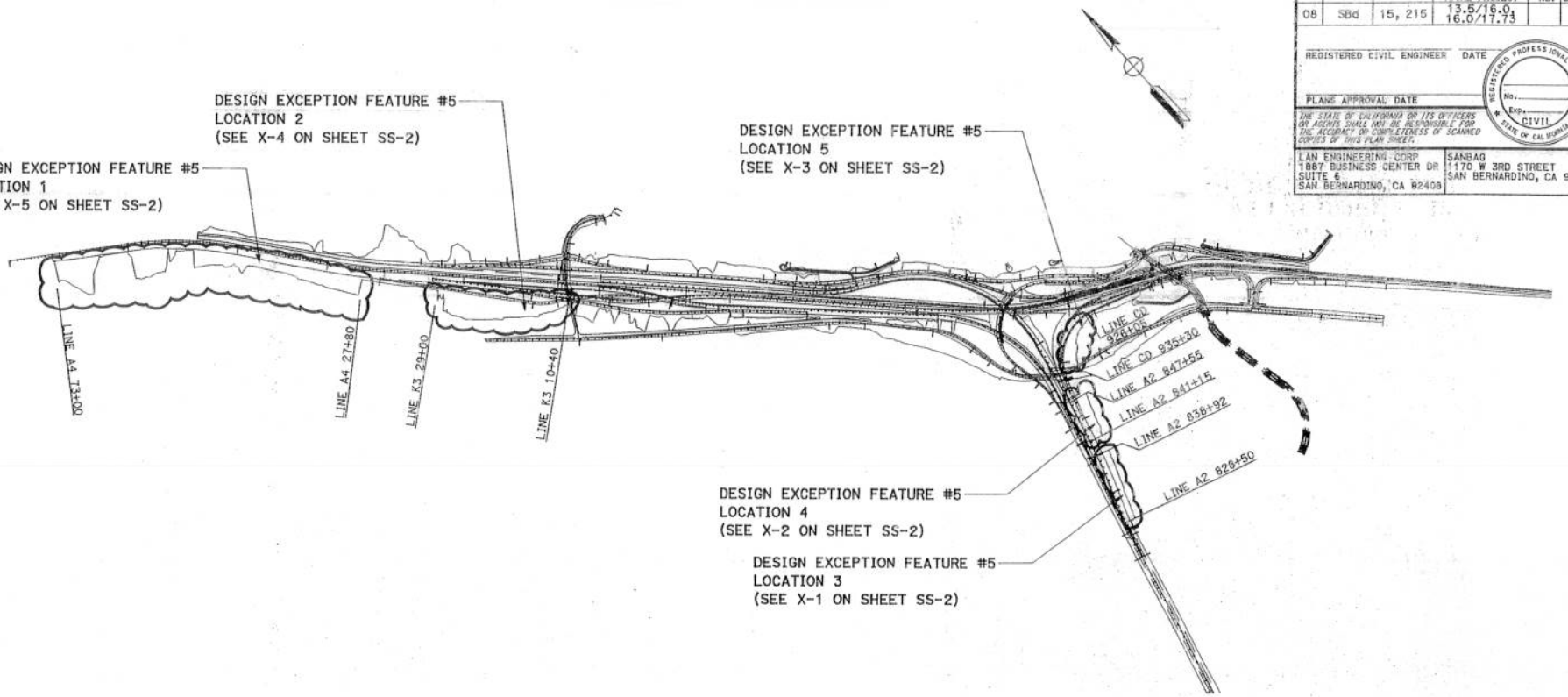

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/17.73		

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SANBAG
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ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #5 - EMBANKMENT FILL SLOPES SHOULD BE 4:1 OR FLATTER

ADVISORY DESIGN EXCEPTION ATTACHMENT 16

NO SCALE

SS-1

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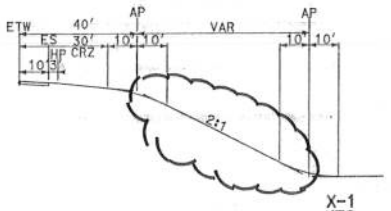
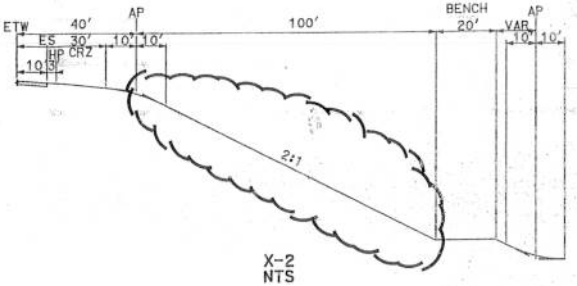
ADVISORY DESIGN EXCEPTION FEATURES:

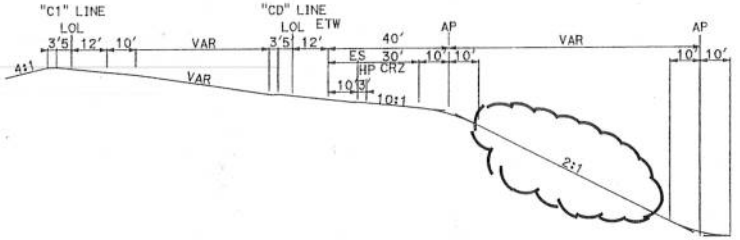
DESIGN EXCEPTION FEATURE #5 – EMBANKMENT FILL SLOPES SHOULD BE 4:1 OR FLATTER



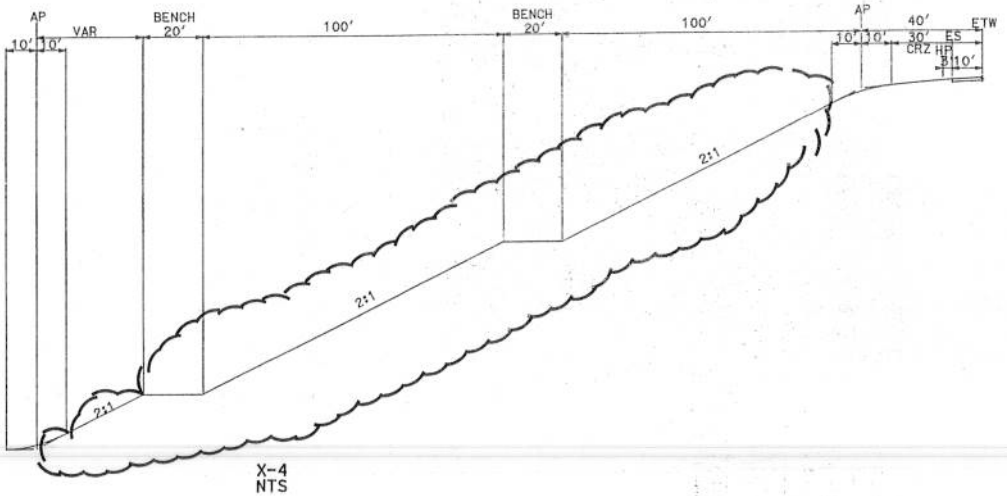
X-1
NTS



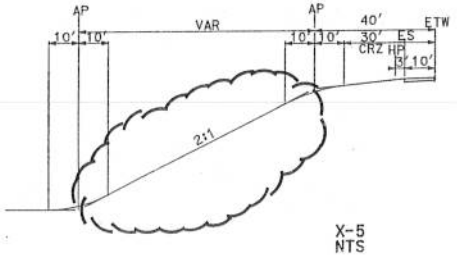
X-2
NTS



X-3
NTS



X-4
NTS



X-5
NTS

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/17.73		

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SANBAG
1170 W 3RD STREET
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Engineers

ADVISORY DESIGN EXCEPTION ATTACHMENT 17

NO SCALE

SS-2

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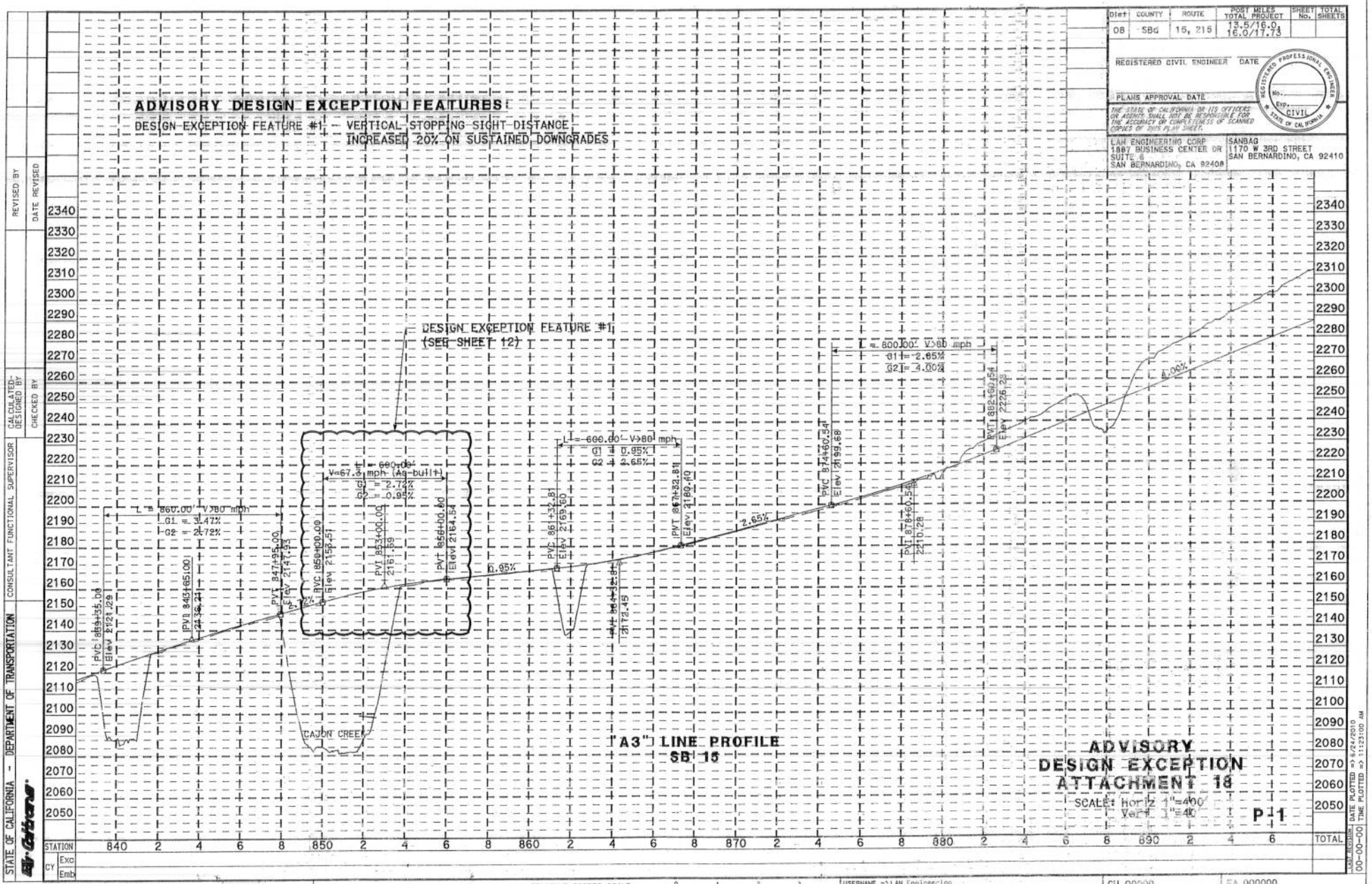

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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LAN Project 00-00-00

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DGN FILE => Alt 3A Advisory Pro 01.dgn

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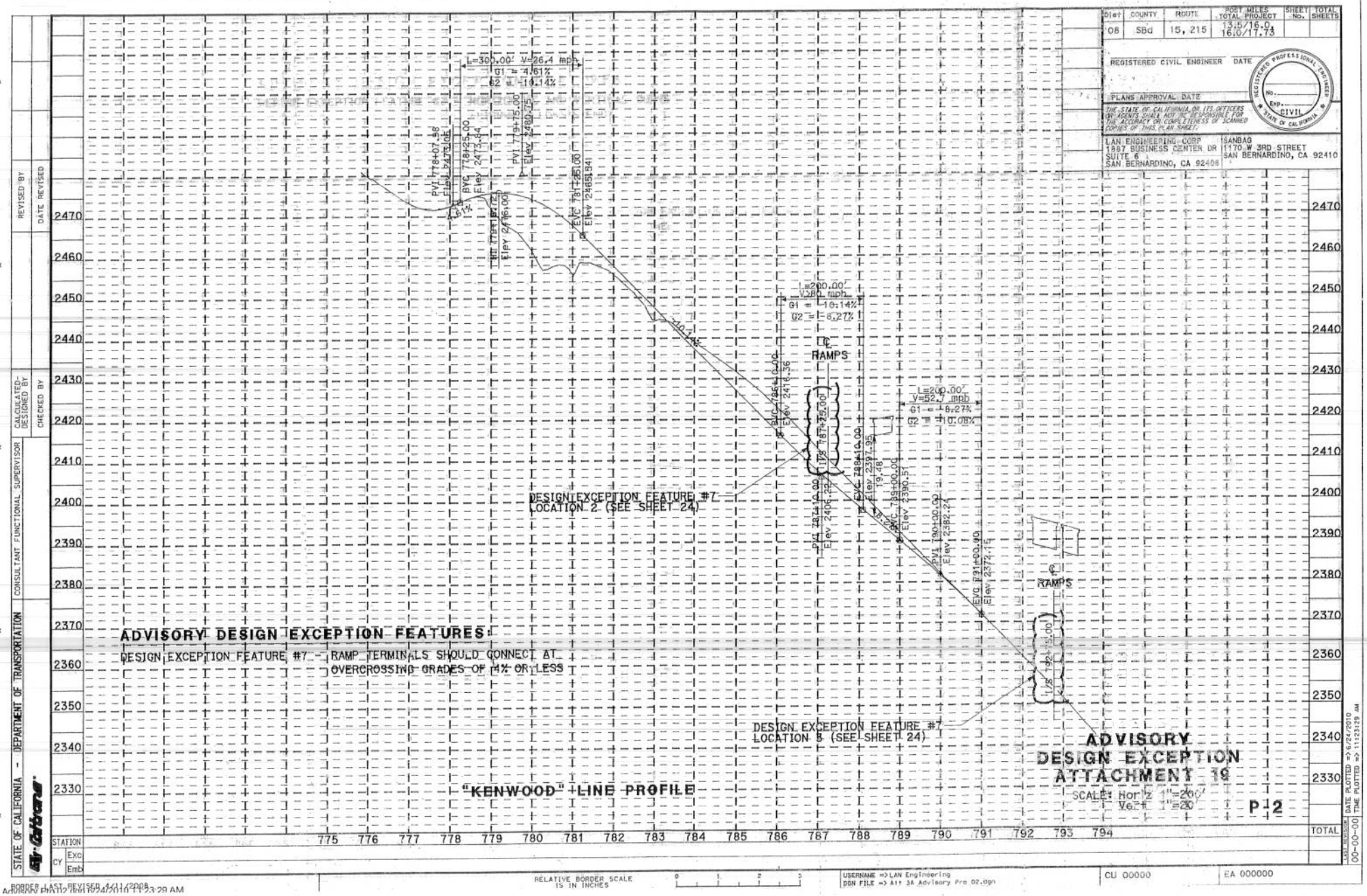

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0, 16.0/17.73		

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Alt 3A Advisory Prp 02.dgn 6/24/2010 11:23:29 AM

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SANBAG
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ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #3 = HORIZONTAL AND VERTICAL CURVE ALIGNMENT CONSISTENCY

DESIGN EXCEPTION FEATURE #3
(SEE SHEET 13 & 14)

BC
856+12.00

PVT 858+61.20
Elev 2149.81

L = 400.00' V>80 mph
G1 = 2.78%
G2 = -0.89%

PVC 862+03.70
Elev 2136.96

PVT 866+03.70
Elev 2129.62

PVI 864+03.70
Elev 2131.40

EC
872+73.00

2.78%

-0.89%

"C2" LINE PROFILE
NB 215 TO SB 15 CONNECTOR

ADVISORY DESIGN EXCEPTION ATTACHMENT 20

SCALE: Horiz 1"=200'
Vert 1"=20'

P-13

STATION	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	TOTAL
CY Exc																														
CY Emb																														

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => LAN Engineering
DGN FILE => Alt 3A Advisory Prp 03.dgn

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DATE PLOTTED => 6/24/2010
TIME PLOTTED => 11:24:07 AM

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.9, 16.0/17.73		

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SUITE 6
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

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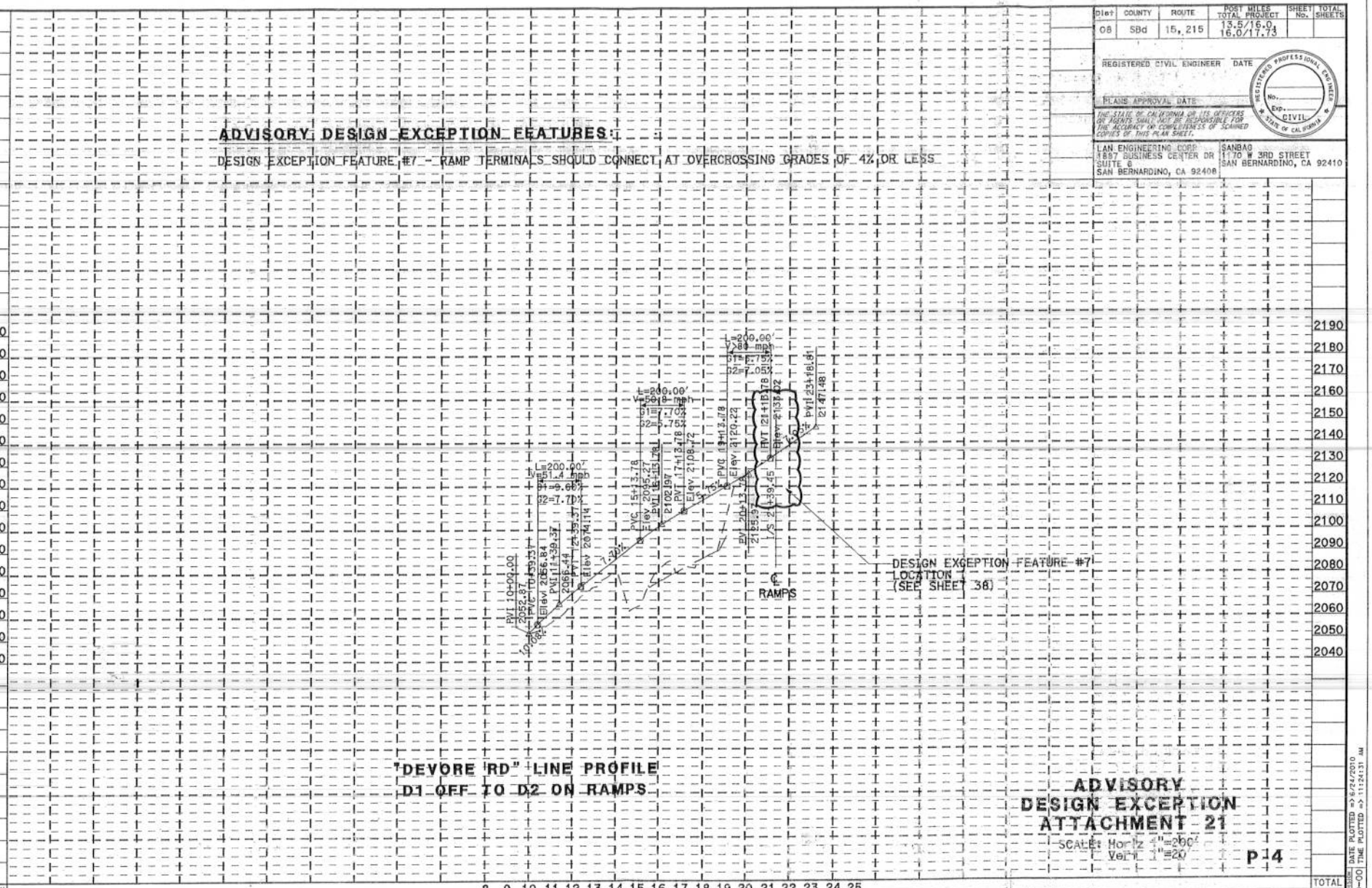
CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Kimley»Horn

ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #7 - RAMP TERMINALS SHOULD CONNECT AT OVERCROSSING GRADES OF 4% OR LESS



"DEVORE RD" LINE PROFILE
D1 OFF TO D2 ON RAMPS

ADVISORY DESIGN EXCEPTION ATTACHMENT 21

SCALE: Horiz 1"=200'
Vert 1"=20'

P14

STATION	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	TOTAL
CY Exc																			
CY Emb																			

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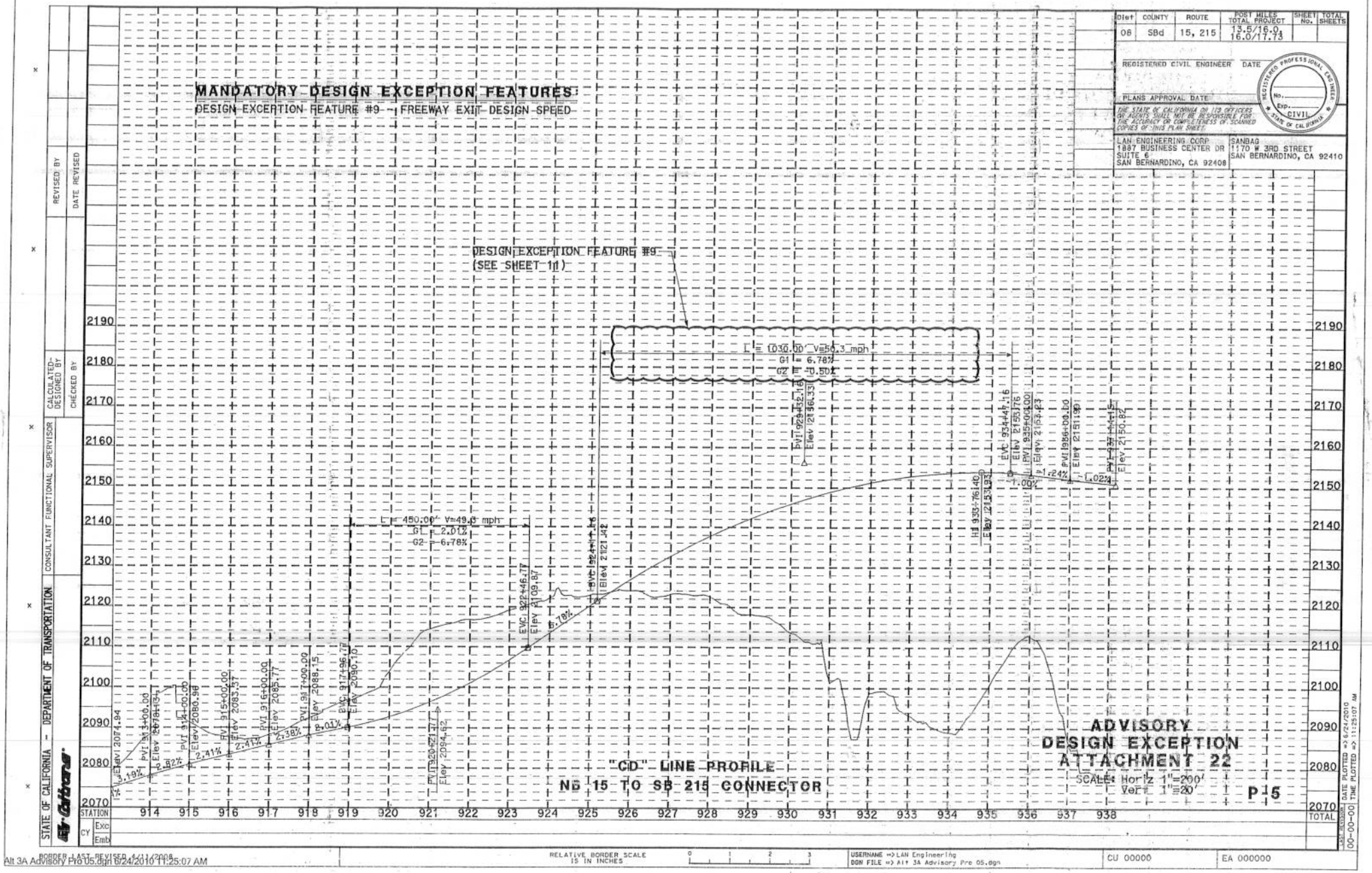

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.6/16.0, 16.0/17.73		

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SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

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EXHIBIT 11-C

Supplemental Fact Sheet Exceptions to Mandatory Design Standards

08-SBd-15, 215, PM 14.0/R16.4, 16.0/17.8
EA 08-0K7100
I-15/I-215 Interchange Improvement Project
January 2012

Supplemental Fact Sheet
Exceptions to Mandatory Design Standards

REGISTERED PROFESSIONAL ENGINEER
Norman Suydam
No. 041152
Exp. 3/31/13
CIVIL
STATE OF CALIFORNIA

Prepared by:

Norman Suydam, P.E. — 1/09/12 Date
Project Engineer
AECOM

Submitted by: for — 1-11-12 Date — (909) 889-8611 Telephone
Dennis Saylor
Project Manager
SANBAG

Recommended for Approval: — 1-11-12 Date — (909) 383-4969 Telephone
Jason Collado
District 8, Office Chief
Design

Concurred by: — 1/11/12 Date — (909) 383-7582 Telephone
Christy Connors
District 8, Deputy District Director
Design/Engineering Services

Approved by: — 1/12/12 Date
Luis Betancourt
Design Coordinator
HQ Division of Design

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This Supplemental Fact Sheet Exceptions to Mandatory Design Standards is to supplement the initial document which was approved by HQ Division of Design on July 1st, 2010, (see Attachment 8). Additional Exceptions to Mandatory Design Standards have been identified and listed under Section 2.

1. PROPOSED PROJECT

A. Project Description

San Bernardino Associated Governments (SANBAG), in cooperation with California Department of Transportation (Caltrans) proposes to reconfigure Interstate 15/Interstate 215 (I-15/I-215) Interchange near Devore (unincorporated area), County of San Bernardino, CA. These sections of highway are access controlled Interstate Freeways adopted by the California Transportation Commission (CTC) in 1969. The purpose of the proposed project is to eliminate congestion, reduce accidents, restore route continuity for Interstate 15 (I-15), construct truck bypass, and improve non-standard weaving between interchanges. Four alternatives were considered ranging from $264 million to $349 million. Project funding is anticipated to be a combination of State, Federal, Local and Measure I funds.

B. Existing Highway

I-15 crosses between the San Gabriel and San Bernardino Mountains in an area known as the Cajon Pass. The Cajon Pass area encompasses approximately twelve miles of freeway from Sierra Avenue in Fontana to Oak Hills Road just past the Cajon summit in the Hesperia area.

I-15 is a major south/north route through Riverside and San Bernardino Counties. Interstate 215 (I-215) branches from I-15 in Temecula in Riverside County just north of San Diego County line. The I-15 proceeds north through the cities of Norco and Corona before entering San Bernardino County through the cities of Ontario, Rancho Cucamonga, and Fontana. I-215 ultimately reconnects with I-15 in the Devore area in San Bernardino County. Separation between I-15 and I-215 corridors is generally about fifteen to twenty miles. I-15 provides one of two south/north links with the National Interstate Network in the Riverside and San Bernardino areas.

Within the project limits, I-15 consists of four mixed flow lanes in each direction from Route 60 to Glen Helen Parkway, three mixed flow lanes in each direction from Glen Helen Parkway to I-215, four mixed flow lanes northerly of the junction with I-215, and one truck climbing lane in the northbound direction only.

I-215 is a major route between Temecula and Devore in Riverside and San Bernardino Counties. I-215 begins in Temecula following an old alignment of U.S. Route 395 through Riverside County, passing through Riverside and San Bernardino, and ending at the junction with I-15 in Devore. Within the project limits, I-215 consists of two through mixed flow lanes in each direction.

North Junction of I-15/I-215

This junction is a "Y" type of system interchange that was constructed in the late 1960s with the alignment towards San Bernardino being the primary move and the southwesterly leg being the diverging route. Because of this, the design standards for the diverging route are less than mainline standards for an Interstate. Currently, the design speeds for the I-15 southwest leg to the Northwest

leg in the NB direction is greater than 80 mph based on the vertical alignment, but is about 69 mph based on the horizontal alignment, while SB direction is 67 mph (vertical) and 69 (horizontal). Therefore, the existing minimum design speeds are less than the desired design standard for an Interstate mainline. The construction of this interchange retained a connection to Devore Road (Glen Helen Parkway) on the I-215 leg which was less than the current standard of a two mile spacing between a system interchange and a service interchange. Along the I-15 alignment, interchanges were constructed at Kenwood which is slightly less than two miles from the system interchange and a local interchange with Glen Helen Parkway to the south, which also is slightly less than the two mile spacing.

C. Safety Improvements

Many of the design elements in the project improve current non-standard features, provide additional capacity or make operational improvements that will have an impact to improve safety for the freeway.

The following improvements provided by this project will enhance safety:

- Add truck bypass lanes through the interchange to eliminate difficult auto/truck weaving conflicts.
- Rebuild the I-215/Devore Road Interchange to eliminate non-standard geometric features.
- Reconfigure the existing I-15/Kenwood Avenue interchange to eliminate non-standard geometric features.
- Eliminating the freeway mainline weaving areas: NB I-215 at Devore Road, NB and SB I-15 between I-215 and Kenwood Avenue.

Northbound I-15

- Adding a northbound mainline line between the Glen Helen Parkway off-ramp and the I-215 junction to reduce congestion.
- Adding a northbound auxiliary lane between the Glen Helen Parkway on-ramp and the I-215 junction to improve operation.
- Construct auxiliary lanes to provide for weaving traffic.
- Widen existing Northbound I-15 to Northbound I-15 Connector to add one lane and allow for passing of slower traffic.

Southbound I-15

- Adding a southbound mainline lane between the I-215 junction and the Glen Helen Parkway on-ramp to provide additional capacity.
- Adding a southbound auxiliary lane between the I-215 junction and the southbound Glen Helen Parkway off-ramp to improve operation of the freeway.
- Add auxiliary lanes to provide for merging and diverging traffic.
- Southbound I-15 and I-215 will braid with each other in order to provide route continuity and eliminate a left hand exit ramp.

Northbound I-215

- Construct one additional northbound lane to provide needed capacity.
- Reconfigure the northbound on-ramps at Devore Road to eliminate a loop on-ramp with high accident rate.

- Realign northbound off-ramp at Devore Road to make alignment standard.
- Construct Northbound I-215 truck bypass to eliminate auto/truck weaving conflicts.

Southbound I-215

- Reconfigure and add one additional lane to the southbound connector to provide needed capacity.
- Braid the Northbound I-15 to Southbound I-215 connector and the Southbound Devore Road off ramp to eliminate a short weaving area along a CD road.
- Reconstruct southbound off-ramp and on-ramp approximately 500 feet southerly of the proposed intersection of Glen Helen Parkway with Devore Road to improve geometry.

D. Total Project Costs

The total estimated project cost is $264,424,641 and the cost break down is shown in the table below.

Construction Cost:	Alt 3A
Roadway	$163,301,000
Structure	$52,172,000
Right-of-Way Acquisition Cost: (including utility relocation)	$32,127,641
Support Cost: (Permits and Mitigation Expenses)	$16,824,000
Total Project Cost:	**$264,424,641**

2. FEATURES REQUIRING AN EXCEPTION

A. Design Exception Feature #1 – Cross Slope – Left Shoulder

Nonstandard Features:

Location 1 (Attachment 3, Sheet 01):
This project proposes to construct the inside left shoulder slope at 2% cross slope in the same plane of the adjacent traveled way on southbound I-215 (line B1) from station 856+14 to 880+00.

Standard for which Exception is Requested:
Index 302.2(2) - Cross Slopes – Left shoulders **"In depressed median sections, shoulders to the left of traffic shall be sloped at 2 percent away from the traveled way."**

Reasons for Requesting Exception:
This portion of I-215 is designed with the anticipation of future lanes to be added to the median. For this reason, the shoulder will be constructed with the same structural section and cross slope of the traveled way at 2%. This will reduce construction cost for the future projects (RTP# 4M01004/4M01003 I-215 Add two mixed flow lane from Route 210 to I-15 and RTP# 4H01008 I-215 Add 2 HOV lanes from Route 210 to I-15).

Added Cost to Make Standard:

Location 1 – There is no additional cost to make standard. The future cost savings is estimated at $3.2 million which includes cost of reconstructing the shoulders for both the NB and SB directions.

B. Design Exception Feature #2 – Travel way Cross Slopes

Nonstandard Features:

Location 2 (Attachment 4, Sheets 01 and 02):
This project proposes to use travel way cross slope of 3% on the outermost lanes of southbound I-15 main line (Line A3) from station 871+47.06 to station 899+20.84.

Location 3 (Attachment 4, Sheet 03):
This project proposes to use travel way cross slope of 3% on the outermost lanes of northbound I-15 main line (Line A2) from station 832+00 to station 846+29.75.

Location 3A (Attachment 4, Sheet 04):
This project proposes to use travel way cross slope of 3% on the outermost lanes of northbound I-15 main line (Line A4) from station 758+16.41 to station 790+00.

Location 3B (Attachment 4, Sheets 05 and 06):
This project proposes to use travel way cross slope of 3% on the outermost lanes of northbound I-15 main line (Line A4) from station 19+74.79 to station 53+71.73.

Location 3C (Attachment 4, Sheets 05 and 06):
This project proposes to use travel way cross slope of 3% on the outermost lanes of southbound I-15 main line (Line A4) from station 17+83.42 to station 72+99.88.

Standard for Which Exception is Requested:
Index 301.2(2)(a) - Cross Slopes – **"The standard cross slope to be used for new construction on the traveled way for all types of surfaces shall be 2 percent."**

Reasons for Requesting Exception:
Location 2, 3, 3A, 3B, 3C:
According to roadway drainage guidance provided in HDM 833.2, "where three (3) lanes or more are sloped in the same direction, it is desirable to counter the resulting increase in flow depth by increasing the cross slope of the outermost lanes". Locations 2, 3, 3A, 3B and 3C as described above are proposed to ultimately consist of (6) or more lanes. Therefore, to reduce the effect of increasing flow depth across multiple lanes that may result in hydroplaning, it is appropriate to increase the cross slope of the outermost lanes to 3% to enhance roadway drainage for (6) lanes or more of pavement. This roadway drainage design improvement was requested by Caltrans HQ Geometrician.

Added Cost to Make Standard:

Location 2, 3, 3A, 3B, 3C – There is no additional cost to make standard.

C. Design Exception Feature #3 – Standards for Superelevation

Nonstandard Features:

This project proposes to use non-standard superelevation rates for horizontal curves at various locations within the project limits listed in the table below. See Attachment 5 for Layouts and superelevation diagrams

Location Description	**Proposed Exception Feature**	Curve Radius	Attachments
No. 4 Line A2 NB I-15 830+38.17 to 836+10.36	**3%**	11,000'	Att. 5 Sheet 01
No. 5 Line A2 NB I-15 846+29.75 to 858+72.62	**Adverse superelevation rate of 1.5% and 2%**	6,000'	Att. 5 Sheet 01
No. 6 Line T2 SB I-15 348+57.61 to 350+50.15	**3%**	3,000'	Att. 5 Sheet 02

No. 7 Line T1 NB I-15TBP 943+71.81 to 945+62.31	**3%**	3,000'	Att. 5 Sheet 03
No.8 Line D1 NB I-215 913+21.11 to 916+95.22	**8%**	300'	Att. 5 Sheet 04
No. 9 Line D4 SB I-215 890+74.90 to 892+42.00	**2%**	3,000'	Att. 5 Sheet 05
No. 10 Line K1 NB Kenwood exit ramp 929+55.31 to 930+88.42	**8.6%**	850'	Att. 5 Sheet 06
No.11 Line K3 SB I-15 13+11.47 to 16+99.98	**8%**	1,200'	Att. 5 Sheet 07

Standard for Which Exception is Requested:
Index 202.2 – Standards for Superelevations – **"Based on an emax selected by the designer for one of the conditions, superelevation rates from Table 202.2 shall be used within the given range of curve radii. If less than standard elevation rate are approved, Figure 202.2 shall be used to determine superelevation based on curve radius and maximum comfortable speed."**

Reasons for Requesting Exception:
Location 4 (Attachment 5, Sheet 01):
According to HDM table 202.2, the superelevation rate should be 2% for a 11,000' radius curve. However, this section of roadway is proposed to be widened at 3% cross slope to enhance roadway drainage for (6) lanes of pavement as explained in Feature 2 Location 3 above. HDM Figure 202.2 determined the maximum comfortable speed for an 11,000' curve with a 3% superelevation rate to be greater than 80 mph, which is greater than the proposed design speed.

Location 5 (Attachment 5, Sheet 01):
According to HDM table 202.2, the superelevation rate should be 2% for a 6,000' radius curve. However, this curve is proposed for a section of existing roadway and bridge which were originally constructed on a tangential alignment with no superelevation and a 1.5% cross slope. It is proposed to widen this bridge to the outside with a 2% cross slope. In order to attain a superelevation rate of 2% for this curve on the existing bridge, the bridge would need to be completely reconstructed. Overlaying the existing bridge deck to achieve a standard SE rate is not possible since the outer edge of the deck would have to be raised by 18". Bridges are typically designed to allow for a nominal 2" AC overlay on the deck as added Dead Load. HDM Figure 202.2 determined the maximum

comfortable speed for a 6,000' curve with a no superelevation and 1.5% adverse cross slope to be 77 mph, which is greater than the posted speed.

A review of the Bridge inspection and maintenance reports reveals that the right bridge has a Sufficiency Rating of 93 and a Health Index of 98.5. These are considered very high numbers indicating the bridge is in very good condition and not in need of replacement. The bridges are experiencing scour of the foundation which is constantly being monitored by Caltrans. The bridges had received a 'PPPPP' rating for permit loads. On this project we are proposing to replace the bridge railings with current standard 736 railings.

Location 6 (Attachment 5, Sheet 02):
According to HDM table 202.2, the superelevation rate should be 4% for a 3,000' radius curve. However, this section of roadway is proposed to be widened at 3% cross slope to enhance roadway drainage for (6) lanes of pavement as explained in Feature 2 Location 2. Additionally, using a 3% superelevation instead of 4% superelevation enhances the roadway drainage more by eliminating a potential low point at the curve where ponding may occur. Furthermore, HDM Figure 504.2A note 6 confirms a 2% superelevation may be acceptable for the 3,000' radius curve on entrance ramps. HDM Figure 202.2 determined the maximum comfortable speed for a 3,000' radius curve with a 3% superelevation rate to be 74 mph, which is greater than the proposed design speed.

Location 7 (Attachment 5, Sheet 03):
According to HDM table 202.2, the superelevation rate should be 4% for a 3,000' radius curve. However, this section of roadway is proposed to be widened at 3% cross slope to enhance roadway drainage for (7) lanes of pavement as explained in Feature 2 Location 3B. Additionally, using a 3% superelevation instead of 4% superelevation enhances the roadway drainage more by eliminating a potential low point at the curve where ponding may occur. Furthermore, HDM Figure 504.2A note 6, confirms a 2% superelevation may be acceptable for the 3,000' radius curve on entrance ramps. HDM Figure 202.2 determined the maximum comfortable speed for a 3,000' radius curve with a 3% superelevation rate to be 74 mph, which is greater than the proposed design speed.

Location 8 (Attachment 5, Sheet 04):
According to HDM table 202.2, the superelevation rate should be 12% for a 300' radius curve. However, under certain restrictive conditions the standard superelevation rate may not be required on the curve nearest the ramp intersection of a ramp per HDM 504.3(4). The restrictive condition at this location is the proposed ramp geometry only provides a short 23' superelevation transition length after the end of curve to the 7% downgrade of Devore Rd at the ramp terminus. After evaluating and discussing this restrictive condition with the Caltrans HQ Geometrician, the 8% superelevation rate was considered acceptable. HDM Figure 202.2 determined the maximum comfortable speed for a 300' radius curve with a 8% superelevation rate to be 33 mph, which is greater than the proposed design speed.

Location 9 (Attachment 5, Sheet 05):
According to HDM table 202.2, the superelevation rate should be 4% for a 3,000' radius curve. However, this section of roadway is proposed to be widened at 3% cross slope to enhance roadway drainage for (4) lanes of pavement. Additionally, using a 3% superelevation instead of 4% superelevation enhances the roadway drainage more by eliminating a potential low point at the curve where ponding may occur. Furthermore, HDM figure 504.2A note 6, confirms a 2% superelevation rate may be acceptable for the 3,000' curve radius on entrance ramps. HDM Figure 202.2 determined

the maximum comfortable speed for a 3,000' radius curve with a 3% superelevation rate to be 74 mph, which is greater than the proposed design speed.

Location 10 (Attachment 5, Sheet 06):
According to HDM table 202.2, the superelevation rate should be 10% for a 850' radius curve. However, under certain restrictive conditions the standard superelevation rate may not be required on the curve nearest the ramp intersection of a ramp per HDM 504.3. The restrictive condition at this location is the proposed ramp geometry only provides a short 32' superelevation transition length after the end of the short 133' long curve to the 8.6% downgrade of Kenwood Ave at the ramp terminus. After evaluating and discussing this restrictive condition with the Caltrans HQ Geometrician, 8.6% was considered acceptable. HDM Figure 202.2 determined the maximum comfortable speed for a 850' radius curve with a 8.6% superelevation rate to be 53 mph, which is greater than the proposed design speed.

Location 11 (Attachment 5, Sheet 07):
According to HDM table 202.2, the superelevation rate should be 9% for a 1,200' radius curve. However, under certain restrictive conditions the standard superelevation rate may not be required on the curve nearest the ramp intersection of a ramp per HDM 504.3(4). The restrictive condition at this location is the proposed ramp geometry only provides a short 290' superelevation transition length after the end of curve to the 10% downgrade of Kenwood Ave at the ramp terminus. The maximum Superelevation transition rate of 6%/station (HDM 202.5(3)) was used along this section of the ramp. After evaluating and discussing this restrictive condition with the Caltrans HQ Geometrician, 8% was considered acceptable. HDM Figure 202.2 determined the maximum comfortable speed for a 1,200' radius curve with a 8% superelevation rate to be 59 mph, which is greater than the proposed design speed.

Added Cost to Make Standard:

Location 4,6,7,8,9,10,11 – There is no additional cost to make standard.

Location 5 –
Added cost to Make Standard
The cost to provide standard is summarized below:

Items	Cost
Roadways	$200,000
Structures	$7,200,000
Estimated Total Cost	**$7,400,000**

D. Design Exception Feature #4 – Minimum Distance between Ramp Intersection and Local Road Intersection

Non-standard Features:

Location 12 (Attachment 6, Sheet 01):
This project proposes 318 feet of distance (curb return to curb return) between the I-215 NB/Devore Rd. intersection and Santa Fe Ave. /Devore Rd. intersection

Standard for Which Exception I Requested:
Index 504.3(3) – Minimum Distance between Ramp Intersection and Local Road Intersection - **"For the new construction or major reconstruction of interchanges, the minimum distance (curb return to curb return) between ramp intersections and local road intersection shall be 400 ft."**

Reasons for Requesting Exception:
The existing intersection spacing between the I-215 NB ramp intersection with Devore Rd. and the adjacent local road intersection with Santa Fe Ave. is approximately 300 feet. This project proposes to reconstruct the I-215 NB/Devore Rd. interchange and shift the I-215 NB/Devore Rd. ramp intersection southerly, thus increasing the ramp intersection spacing at this location to 318 feet.

To comply with the ramp intersection spacing standard, Santa Fe Ave. would need to be realigned and its intersection with Devore Rd. would need to be relocated north by at least 85 feet. Consequently, the realignment would result in significantly more right of way acquisition and residential housing displacement as well as require additional environmental studies.

The approved Traffic Operational Analysis (TOA) shows that the ramp intersection with Devore Rd. will operate at an LOS of 'C' in the year 2040 using 3-way stop control. The intersection of Devore Rd. and Santa Fe Ave is a 2-way stop controlled intersection with only the side roads having stop signs. No queuing of cars is developed along Devore Rd. at that intersection. The queuing analysis at the ramp intersection in the TOA shows only the NB Devore Rd. left turn move will have a queue of one vehicle (25') in the year 2040.

Added cost to Make Standard
The cost to provide standard is summarized below:

Items	Cost
Roadways	$200,000
Right of Way	$1,000,000
Estimated Total Cost	**$1,200,000***

*Total estimated cost does not include cost for environmental studies and mitigation

E. Design Exception Feature #5 – Shoulder width for Freeway-to-Freeway Connector

Non-standard Features:

Location 13 (Attachment 7, Sheet 01):
This project proposes a right shoulder width that varies from 10' to 8' and a left shoulder width that varies from 5' to 4' along an existing bridge structure from Sta. 853+97.30 to Sta. 849+02.53 C2 Line on the NB I-215 to SB I-15 connector.

Standard for Which Exception Is Requested:
Index 504.(4)(a) – Shoulder width for Freeway-to-Freeway Connector - "**The width of shoulders on the single-lane and two-lane freeway-to-freeway connectors shall be 5 feet on the left and 10 feet on the right.**"

Reasons for Requesting Exception:
This project proposes to widen the existing freeway-to-freeway connector to include a 24' traveled way, a 10' outside shoulder and 5' inside shoulder (39' total width). The freeway-to-freeway

connector along the Cajon Creek Bridge was originally constructed according to standard with only 4' left and 8' right shoulders and varying traveled way width and has a rail to rail width that varies only from 32' to 24'. The Cajon Creek connector bridge would need major reconstruction for sliver widening up to 3' wide to include standard shoulder widths with varying traveled way.

The overhang could be widened to a width equal to 50% of the width of the internal cell closest to the exterior of the bridge. This bridge has a variable width with 3 equal width cells inside. At the narrowest point of the superstructure (where we have the non-standard features) it is about 21' wide making each cell about 7' wide. Therefore the max overhang could be about 3'-6". The existing bridge overhang is 3'-2". Using the above criteria we could only sliver widen the bridge about 4" which would not eliminate the non-standard feature.

The Left bridge has a Sufficiency Rating of 70.7 and a health index of 99. The report which was prepared prior to recent construction project on the bridge noted cracking of the deck and it recommended remedial action which recently applied a methacralate overlay on the deck. The bridges are experiencing scour of the foundation which is constantly being monitored by Caltrans. The bridges had received a 'PPPPP' rating for permit loads. On this project we are proposing to replace the bridge railings with current standard Type 736 railings.

For this area, the statewide accident rate is 0.8 and the actual rate 0.1. This correlates to one accident in a 3 year period. There are no broadside accidents.

Added cost to Make Standard

The cost to provide standard is summarized below:

Items	Cost
Roadways	$100,000
Structures	$320,000
Estimated Total Cost	**$420,000**

3. TRAFFIC DATA

A Traffic Report was prepared by Iteris for the project. The SCAG "interim" travel model was utilized to develop traffic forecasts for year 2040 conditions. The interim model is the most current model available from SCAG. The forecast 2040 average daily traffic (ADT) volumes range from 122,000 to 191,100 vehicles along the I-15 and from 65,400 to 80,400 vehicles along the I-215.

Traffic volumes in the corridor are forecast to more than double by 2040. The peak hour directional volumes on I-15 are forecast to range between 4,988 vehicles/hour (A.M. Northbound, I-215 SB Connector to I-215 NB Connector) and 14,452 vehicles/hour (A.M. Southbound, North of Kenwood to Kenwood Ave Off-Ramp). The peak hour directional volumes on I-215 are forecasted to range between 2,840 vehicles/hour (A.M. Northbound, Palm Ave Off-Ramp to Palm Ave On-Ramp) and 6,749 vehicles/hour (A.M. Southbound, Palm Ave On-Ramp to University Pkwy Off-Ramp). Table 1 provides a comparison of the existing and year 2040 mainline peak-hour volumes.

Table 1: Freeway Mainline Peak Hour Demand Comparison

Freeway Segment	A.M. Peak Hour			P.M. Peak Hour		
	Year 2007	Year 2040	% Growth	Year 2007	Year 2040	% Growth
I-15 Northbound						
Sierra Ave On Ramp to Glen Helen Pkwy Off Ramp	2,132	5,898	177	4,107	8,862	116
Glen Helen Pkwy Off Ramp to Glen Helen Pkwy On Ramp	2,068	5,704	176	3,929	8,392	114
Glen Helen Pkwy On Ramp to I-215 SB Connector	2,084	5,808	179	3,983	8,880	123
I-215 SB Connector to I-215 NB Connector	1,740	4,988	187	3,654	8,086	121
I-215 NB Connector to Kenwood Ave Off Ramp	2,595	7,931	206	5,990	13,567	126
Kenwood Ave On Ramp to North of Kenwood	2,573	7,871	206	5,904	14,061	138
I-15 Southbound						
North of Kenwood to Kenwood Ave Off Ramp	6,659	14,452	117	3,714	11,119	199
Kenwood Ave Off Ramp to Kenwood Ave On Ramp	6,644	13,869	109	3,705	11,108	200
Kenwood Ave On Ramp to I-215 SB Connector	6,832	14,079	106	3,754	11,198	198
I-215 SB Connector to I-215 NB Connector	4,170	8,385	101	2,663	7,099	167
I-215 NB Connector to Glen Helen Pkwy Off Ramp	4,707	9,042	92	3,138	7,794	148
Glen Helen Pkwy On Ramp to Sierra Ave Off Ramp	4,741	9,424	99	3,187	7,920	149
I-215 Northbound						
University Pkwy On Ramp to Palm Ave Off-ramp	1,231	3,711	210	2,693	6,713	149
Palm Ave Off Ramp to Palm Ave On Ramp	896	2,840	217	2,231	5,571	150
Palm Ave On Ramp to Devore Rd Off Ramp	1,301	3,293	153	2,783	6,184	122
Devore Road Off Ramp to Devore Road On Ramp	1,231	3,143	155	2,657	5,949	124
Devore Road On Ramp to I-15 SB Connector	1,392	3,600	159	2,811	6,185	120

I-215 Southbound						
I-215 SB Connector to I-215 SB	2,662	5,694	114	1,091	4,101	276
CD Off Ramp to CD On Ramp	2,607	5,536	112	1,051	4,016	282
CD On Ramp to Palm Ave Off Ramp	2,965	6,471	118	1,440	4,462	210
Palm Ave Off Ramp to Palm Ave On Ramp	2,380	5,688	139	1,172	4,187	257
Palm Ave On Ramp to University Pkwy Off Ramp	2,913	6,749	132	1,640	5,151	214

Table 2 shows the Opening Year 2017 and Design Year 2040 peak hour volumes for various ramp locations.

Table 2: I-15/I-215 Ramp Traffic Volumes

Ramp	Year 2017		Year 2040	
	AM	PM	AM	PM
I-15 Northbound				
Off Ramp to Glen Helen Pkwy	101	272	194	470
On Ramp from Glen Helen Pkwy	43	189	104	488
Off Ramp to I-215 SB Connector	486	469	820	793
Off Ramp to Kenwood Avenue	51	190	79	309
On Ramp from Kenwood Avenue	17	279	20	794
I-15 Southbound				
Off Ramp to Kenwood Avenue	188	9	584	11
On Ramp from Kenwood Avenue	194	59	210	90
On Ramp from I-215 Connector	0	0	0	0
Off Ramp to Glen Helen Pkwy	71	29	152	64
On Ramp from Glen Helen Pkwy	210	100	535	190
I-215 Northbound				
Off Ramp to Palm Avenue	491	665	871	1143
On Ramp from Palm Avenue	418	569	453	613
Off Ramp to Devore Road	92	157	150	235
On Ramp to Devore Road	248	176	457	236
I-215 Southbound				
Off Ramp to CD	86	53	158	85
On Ramp from CD	532	405	935	447
Off Ramp to Palm Avenue	643	269	784	275
On Ramp from Palm Avenue	692	611	1061	963

4. ACCIDENT DATA

Caltrans District 8 provided Traffic Accident Surveillance and Analysis System (TASAS) data along I-15 (PM 14.0 to R16.4) and I-215 (PM 16.00 to 17.75). This data covered the project area and was for the period of July 01, 2007 through June 30, 2010.

Table 3: TASAS Accident Rate from 07/01/2007 to 06/30/2010

Location	Actual *(Per MVM for mainline, per MV for ramp)*			Average *(Per MVM for mainline, per MV for ramp)*		
	Fatal	F + I	Total	Fatal	F + I	Total
Route 15 Mainline:						
Mainline, NB from PM 14.000 to 15.100	0.000	0.27	0.71	0.011	0.29	0.82
Mainline, NB from PM 15.101 to 16.373	0.000	0.09	0.32	0.012	0.30	0.87
Mainline, NB from PM R14.273 to R14.990	**0.016**	0.15	0.51	0.008	0.23	0.64
Mainline, NB from PM R14.991 to R16.100	0.000	**0.31**	0.59	0.008	0.23	0.64
Mainline, SB from PM 14.000 to 14.400	0.000	0.07	0.17	0.010	0.26	0.74
Mainline, SB from PM 14.401 to 16.100	0.008	0.22	0.49	0.012	0.30	0.87
Mainline, SB from PM 16.101 to 16.373	0.000	**0.15**	0.35	0.012	0.30	0.87
Mainline, SB from PM R14.048 to R14.960	**0.026**	**0.37**	**0.84**	0.008	0.23	0.64
Mainline, SB from PM R14.961 to R16.400	**0.024**	**0.33**	**0.77**	0.008	0.23	0.64
Mainline, NB from R13.799 to R14.275 *	**0.025**	0.12	0.20	0.011	0.29	0.81
Mainline, SB from R13.799 to R14.048 *	0.000	0.24	0.42	0.014	0.34	0.97
Route 15 Ramps:						
NB Exit to Glen Helen Pkwy, PM 14.565	0.000	**2.11**	**3.51**	0.007	0.37	1.20
SB Entrance from Glen Helen Pkwy, PM 14.587	0.000	0.00	0.00	0.004	0.18	0.60
SB Exit to Glen Helen Pkwy, PM 14.996	0.000	0.00	0.46	0.007	0.37	1.20
NB Entrance from Glen Helen Pkwy, PM 15.008	0.000	0.00	**2.28**	0.004	0.18	0.60
NB Exit to SB I-215, PM 16.137	0.000	**0.12**	0.12	0.003	0.10	0.30
SB Exit to SB I-15, PM R14.048 **	0.000	0.00	0.03	0.003	0.10	0.30
NB Entrance from NB I-15, PM R14.273 **	0.000	0.00	0.00	0.005	0.20	0.60
SB Entrance from Kenwood Ave, PM R14.787	0.000	0.00	0.00	0.004	0.18	0.60
NB Exit to Kenwood Ave, PM R14.806	0.000	0.00	0.65	0.007	0.37	1.20
SB Exit to Kenwood Ave, PM R15.200	0.000	**7.60**	**15.21**	0.007	0.37	1.20
NB Entrance from Kenwood Ave, PM R15.210	0.000	0.00	0.00	0.004	0.18	0.60

Location	Actual *(Per MVM for mainline, per MV for ramp)*			Average *(Per MVM for mainline, per MV for ramp)*		
	Fatal	**F + I**	**Total**	**Fatal**	**F + I**	**Total**
Route 215 Mainline:						
Mainline, NB from PM 16.00 to 17.753	**0.016**	0.17	0.42	0.009	0.24	0.70
Mainline, SB from PM 16.00 to 17.753	**0.016**	**0.34**	0.75	0.009	0.24	0.70
Route 215 Ramps:						
SEG SB Entrance from Cajon Blvd, PM 17.075	0.000	0.00	**1.52**	0.004	0.23	0.70
NB Exit to Devore Rd, PM 17.146	0.000	**2.11**	**3.51**	0.004	0.42	1.20
NB Entrance from Devore Rd, PM 17.253	0.000	**0.61**	**1.52**	0.008	0.16	0.55
NB Exit to SB I-15, PM 17.489	0.000	0.00	0.10	0.007	0.26	0.80
SEG SB Exit to Cajon Blvd, PM 17.654	0.000	0.00	**6.52**	0.004	0.23	0.70

* TASAS identifies this as part of the I-15 'mainline', however it is actually a portion of the northbound and southbound I-215 connectors.
** TASAS identifies this as a 'ramp' to the freeway but actually it is the I-15 'mainline' northbound and southbound.
Note: **BOLD #** Indicate actual is higher than the statewide average.

The TASAS data indicates that the accident (fatal and fatal/injury) rates are higher than the statewide average for similar facilities with comparable traffic volumes.

Within the project limits the data revealed a total of 537 accidents of which 10 were fatal (1.86%), 217 were injuries (40.41%) and 310 were property damage only (57.73%). The types of the accidents are summarized in the following table:

Table 4: Type of Collision

Type of Collision	Number	Percent in Total (%)
Rear End	161	29.98
Hit Object	154	28.68
Sideswipe	129	24.02
Overturn	51	9.50
Broadside	25	4.66
Other	9	1.68
Auto/Pedestrian	3	0.56
Head On	2	0.37
Not Stated	3	0.56

The primary collision patterns are summarized in the following table:

Table 5: Primary Collision Factor

Primary Collision Factor	Number	Percent in Total (%)
Excessive Speed	188	35.01
Improper Turn	137	25.51
Other Violation	127	23.65
Driving Under Influence	44	8.19
Other Than Driver	18	3.35
Failure to Yield	14	2.61
Following Too Close	7	1.30
Unknown	2	0.37

The project is expected to reduce congestion and improve operations on I-15 and I-215 and as a result is anticipated to also reduce the accident rates in the area.

A. Accident Analysis

The accident rates within the project limits vary from above to below the statewide average for similar facilities. This discussion will address the higher accident rates to identify the possible causes and corrective actions that can be implemented in this project.

The northbound I-15 from the I-15/I-215 Interchange to north of the Kenwood Avenue Interchange (PM R14.99 to R16.1) has accident rates higher than the statewide average for similar facilities. This is the location where the freeway merges with the lanes from I-215. Northbound trucks from I-215 must merge onto I-15 and weave across to reach the slow lanes. There is also a non-standard weaving distance to the Kenwood exit ramp. It is believed that many of the accidents in this area are related to these weaving / merging maneuvers. This project will construct northbound truck bypass lanes in all of the alternatives, which will reduce the truck weaving maneuver and the congestion related to it. The northbound Kenwood exit ramp will only be accessible from the truck bypass, thus eliminating the non-standard weaving section. A reduction in the accident rate is anticipated.

Southbound I-15 from north of the Kenwood Avenue Interchange to the I-15/I-215 Interchange (PM R14.0 to R16.4) has an accident rate higher than the statewide average for similar facilities. This is in the location where two auxiliary lanes are added prior to the I-15 diverge from the mainline on the right side. There is also a non-standard weaving area between the southbound Kenwood entrance ramp and the I-215 diverging on the left creating a short weaving area for the number of lanes which need to be crossed to access the I-215 connector. It is believed that the substantial number of lane changes associated with I-15 traffic staying on I-15 is causing congestion in this area and contributes to the higher accident rates. Alternative 3A resolves the issue associated with the right side I-15 diverge. Route continuity is provided with the I-215 traffic diverging to the right and I-15 auto traffic staying in the three left lanes. The southbound Kenwood entrance ramp cannot access I-215 in this configuration also eliminating the non-standard weave. This design is anticipated to reduce the accident rate in this area.

The northbound exit and entrance ramps at Glen Helen Parkway have higher accident rates than similar facilities statewide. This is the location where the freeway narrows from four to three lanes and

typically has recurring congestion in the evenings. This project will add one through lane and one auxiliary lane within this area to reduce congestion. A corresponding reduction in the accident rate is anticipated.

The northbound exit ramp at Kenwood Ave has a slightly higher accident rate than similar facilities statewide. It is believed that this has the same cause as the I-15 mainline; weaving and merging of vehicles within a non-standard weaving distance. The reconfiguration of the exit ramp from the truck bypass lanes is anticipated to reduce the accident rate for the ramp.

The southbound Kenwood exit ramp has an accident rate higher than the statewide average for similar facilities. This high rate (15.21 vs. 1.20) can be attributed to only a few accidents on a relatively low volume ramp. These accidents mostly involve trucks descending Cajon Pass and experiencing what appears to be brake failure, or the inability to stop at the ramp termini.

The southbound I-215 mainline has an accident rate slightly higher than the statewide average for a similar facility. Improvements in this area will add a third lane and a wider left shoulder. These improvements should improve the situation.

The southbound I-215 CD road (PM 17.075 and 17.654) has an accident rate higher than the statewide average for a similar facility. This collector-distributor road has a very short weaving section where traffic from the northbound I-15 connector merges with southbound I-215 traffic going to the Devore Rd. exit ramp. This exit ramp also has a tight radius 'hook' configuration. The southerly end of this weaving section also has a crest vertical curve with limited sight distance. These three factors contribute to the high accident rate. In Alternative 3A the weaving section is eliminated by braiding the Devore Rd. exit ramp. The I-215 southbound Devore Rd. hook ramps are moved further south, a larger radius is provided, and a longer deceleration distance provided prior to the first curve. All of these proposed designs are anticipated to reduce the accident rate along this section of freeway.

The northbound I-215 exit and entrance ramps at Devore Rd. have accident rates higher than the statewide average for a similar facility. The non-standard geometric configuration of the ramps may be a contributing factor to the higher accident rates. The entrance ramp has a compound curve ending in a very tight loop, and merges with high speed auxiliary lanes. Following the merge onto the I-215 mainline there is an immediate weaving area prior to the southbound I-15 connector. Alternative 3A will eliminate the loop entrance ramp to northbound I-215 as well as the short auxiliary lane. The proposed design provides a direct ramp to northbound I-15 & southbound I-15.

5. INCREMENTAL IMPROVEMENTS

Feature 4, location 12: The distance (curb return to curb return) between the existing ramp intersection and Santa Fe is 300 feet. The distance between the proposed ramp intersection and Santa Fe is 318 feet. Therefore, the incremental improvement is 18 feet.

6. FUTURE CONSTRUCTION

This project is compatible with the proposed I-15 ultimate facility currently under study by SANBAG and Caltrans. The Route Concept Fact Sheet dated 1999, addresses the ultimate facility as being an 8+2 freeway. The I-15 Corridor Feasibility Study has three conceptual elements for the ultimate facility. When finally approved, these features will be incorporated into the new Route Concept Report currently being updated by Caltrans. The three elements being considered are:

- Add two HOV lanes (traditional widening adjacent to #1 lane)
- Construct 'Managed' lanes (similar to the reversible lanes in San Diego on I-15)
- Construct barrier separated "Truck Only" Lanes.

The managed lane concept could be 2, 3 or 4 lanes wide with or without a movable barrier to reconfigure the number of lanes in the heavier direction of travel. Reversible use of these lanes would favor the heaviest demand direction. The HOV and Managed lanes can be accommodated in the median of the south leg of I-15. The truck lane concept takes up the most width which would require outside widening of the south leg of I-15. The north leg of I-15 presents a challenge to this project because it is unknown which alternative will be selected for the corridor. The northbound and southbound roadbeds are on independent profiles and are separated vertically by up to 15 feet. Addition of more than one lane in the median will require extensive use of retaining walls for several miles.

An optional configuration on this leg would be to construct a 3rd roadbed on an independent profile further up the side of the hill, easterly of the northbound lanes. This new roadbed could be used for either the northbound mainline or the new 'managed' or 'truck' lanes. The existing northbound roadbed might be used for the managed/truck lanes if the northbound auto traffic uses the new roadbed. Close coordination with the corridor project will be needed as final design approaches.

The I-215 corridor also needs to be considered in these designs as it has not been built to its ultimate width which is 8 MF lanes + 2 HOV lanes. The August 1999 Route Concept Fact sheet identified the need for two HOV lanes on this section of I-215 just to meet the 2015 traffic demand. A revised Route Concept Report is being prepared by Caltrans at this time. The ultimate facility for I-215 will be considered in the development of this project.

7. PROJECT REVIEWS, CONCURRENCE

The exception has been reviewed during the Geometric Approval Drawing phase by the following individuals:

1. Anthony Ng, P.E., Headquarters Design Reviewer
2. Robert Lyles, P.E., Design Oversight Engineer
3. Theresa Sasis, P.E., Traffic Operations Reviewer
4. Luis Bentancourt, P.E, Headquarters Design Coordinator

8. ATTACHMENTS

Attachment 1 - Location Map

Attachment 2 - Key Map

Attachment 3 - Design Exception Feature # 1

Attachment 4 - Design Exception Feature # 2

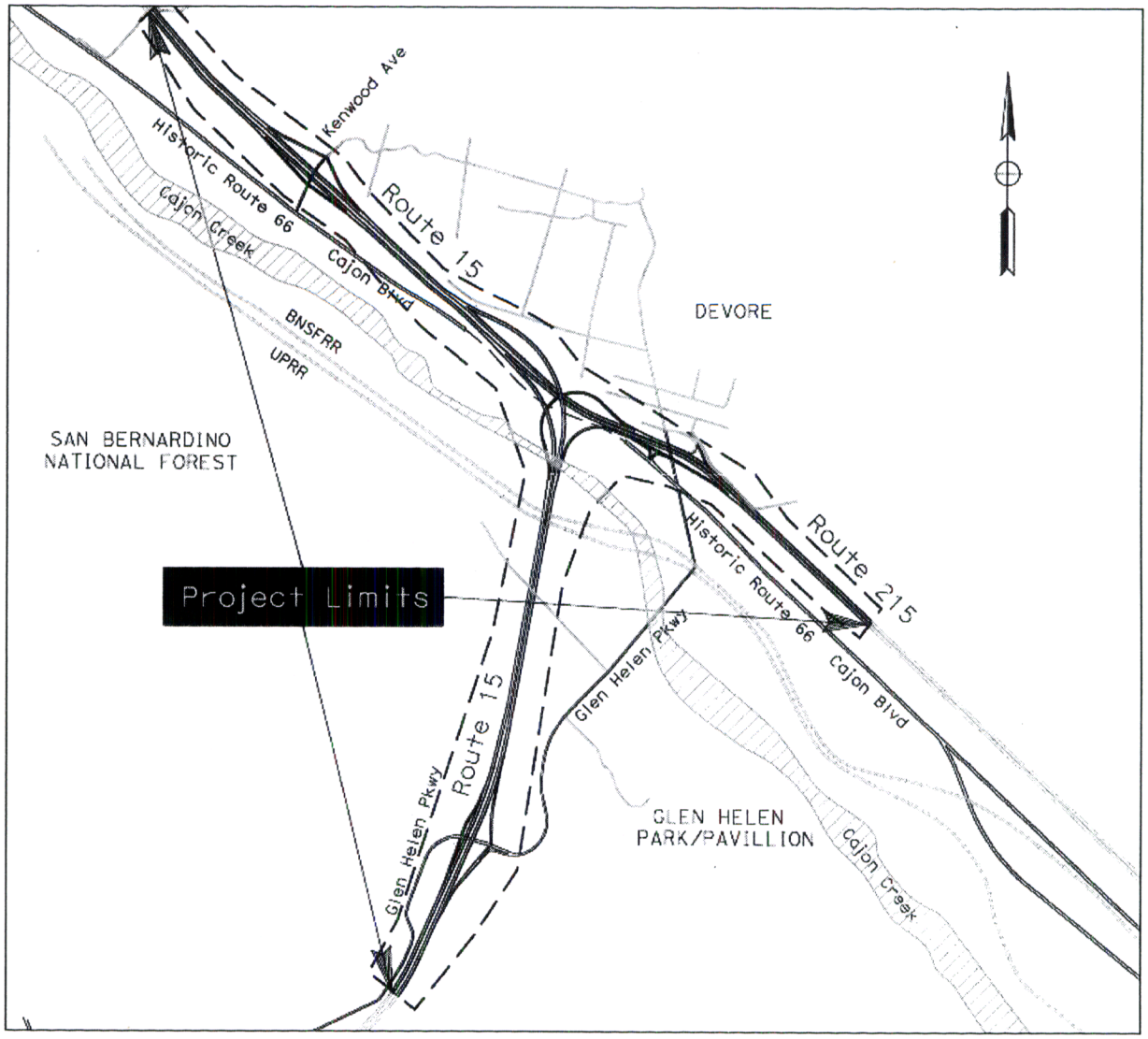
Attachment 5 Design Exception Feature # 3

Attachment 6 Design Exception Feature # 4

Attachment 7 Design Exception Feature # 5

Attachment 8 - Approved Fact Sheet Exceptions to Mandatory Design Standard

Attachment 1
Location Map



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08	SBd	15, 215	14.0/16.4, 16.0/17.8		

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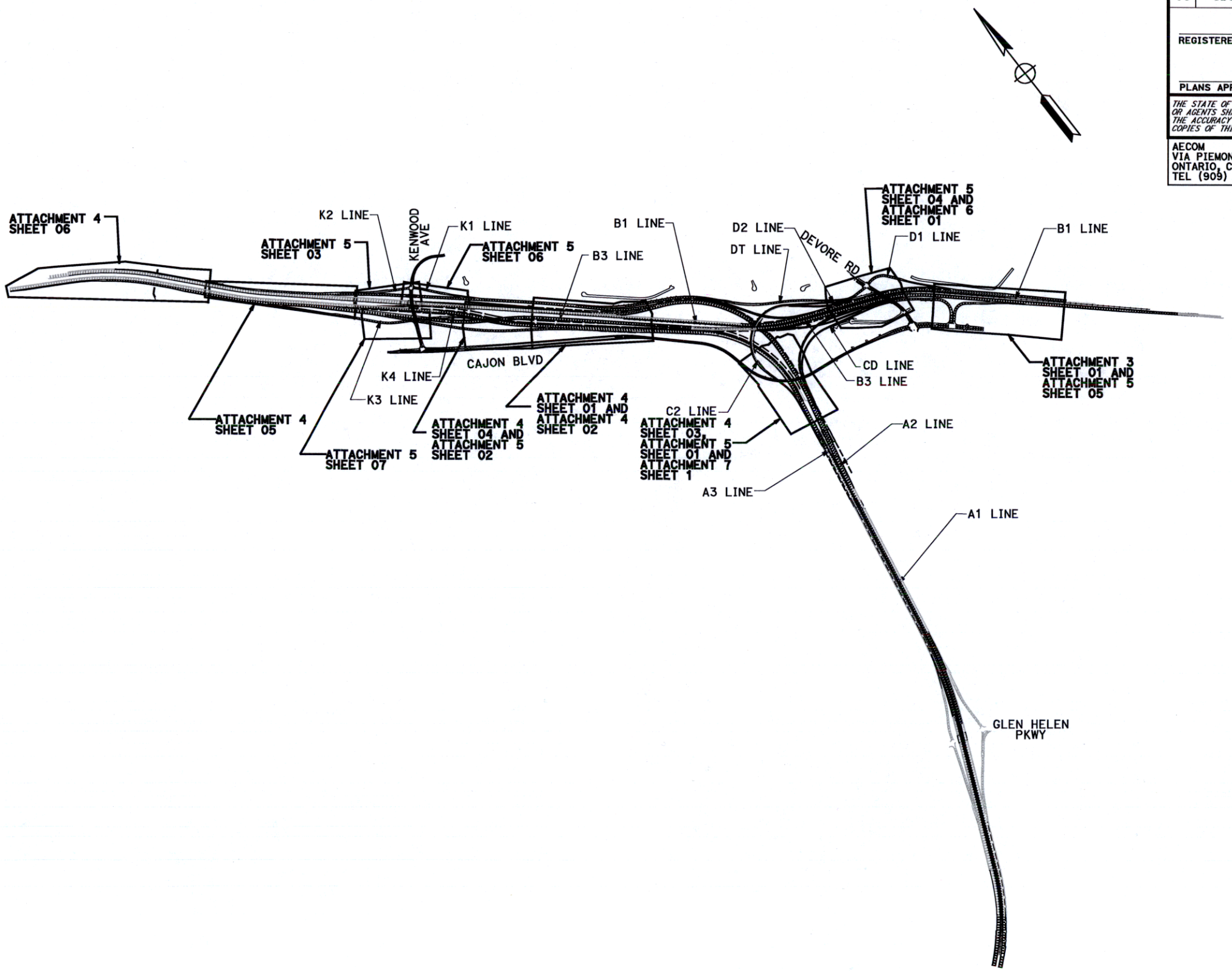

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KEY MAP
MANDATORY
DESIGN EXCEPTION
ATTACHMENT 2

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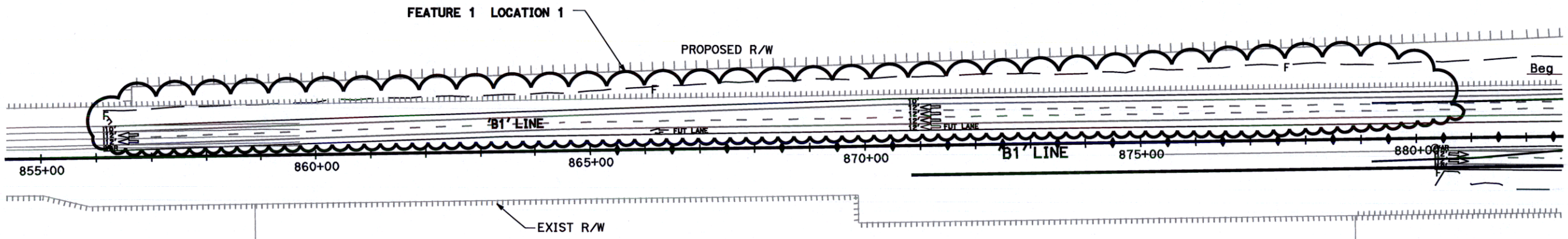

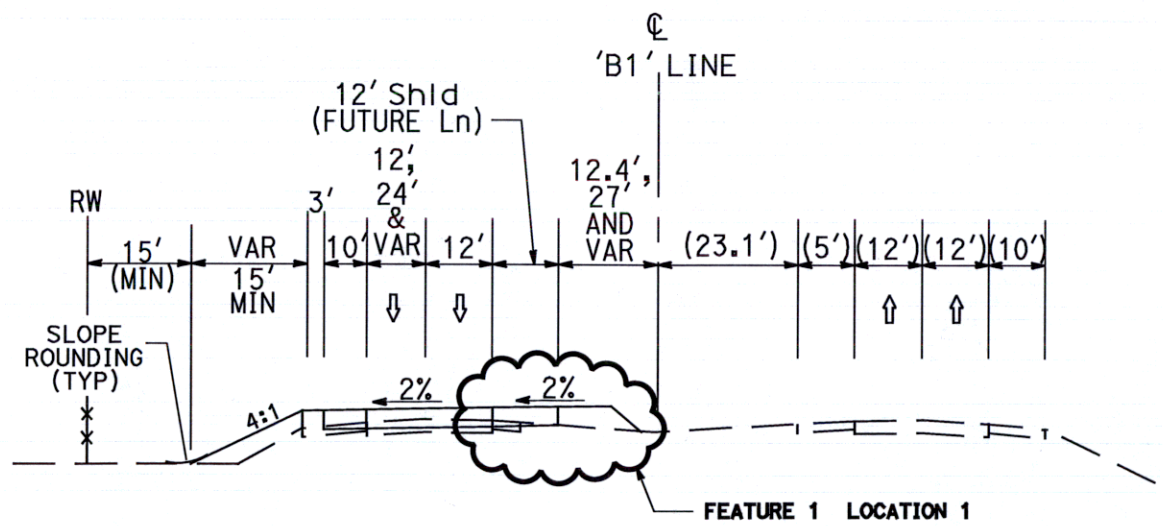

STA 856+14 to STA 880+00 'B1'

INTERSTATE - 215 SB LANES
'B1' LINE

NTS

FEATURE 1 LOCATION 1

MANDATORY DESIGN EXCEPTION ATTACHMENT 3

SCALE: NTS

SHEET 01

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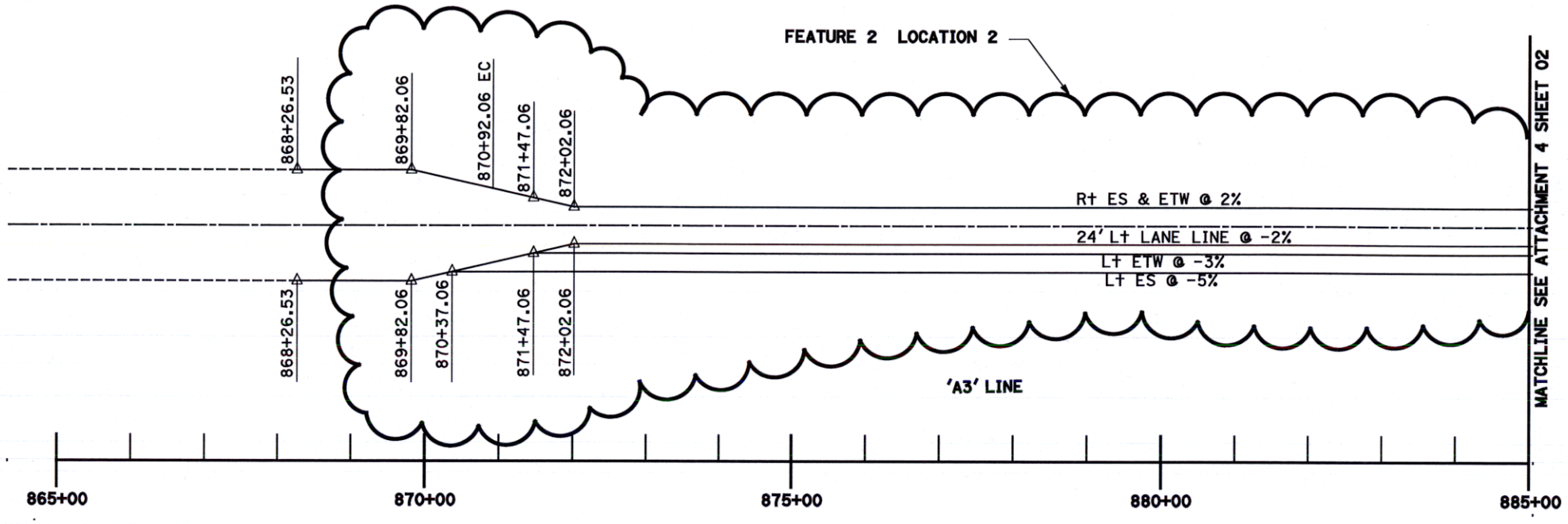

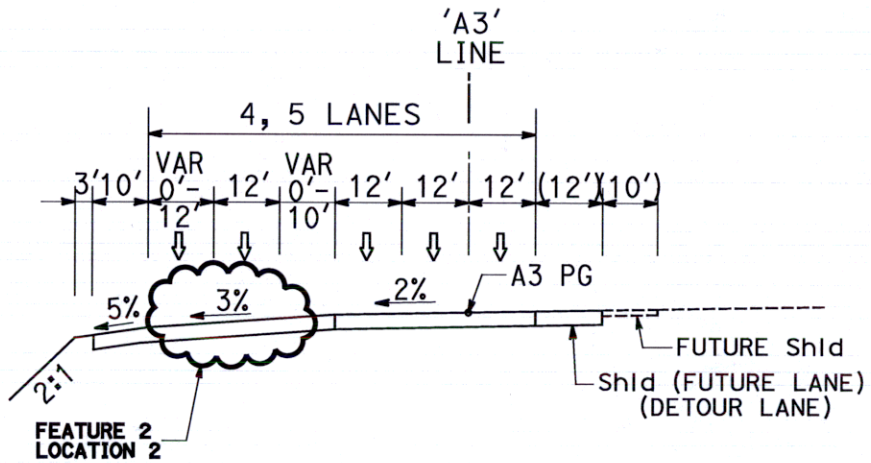

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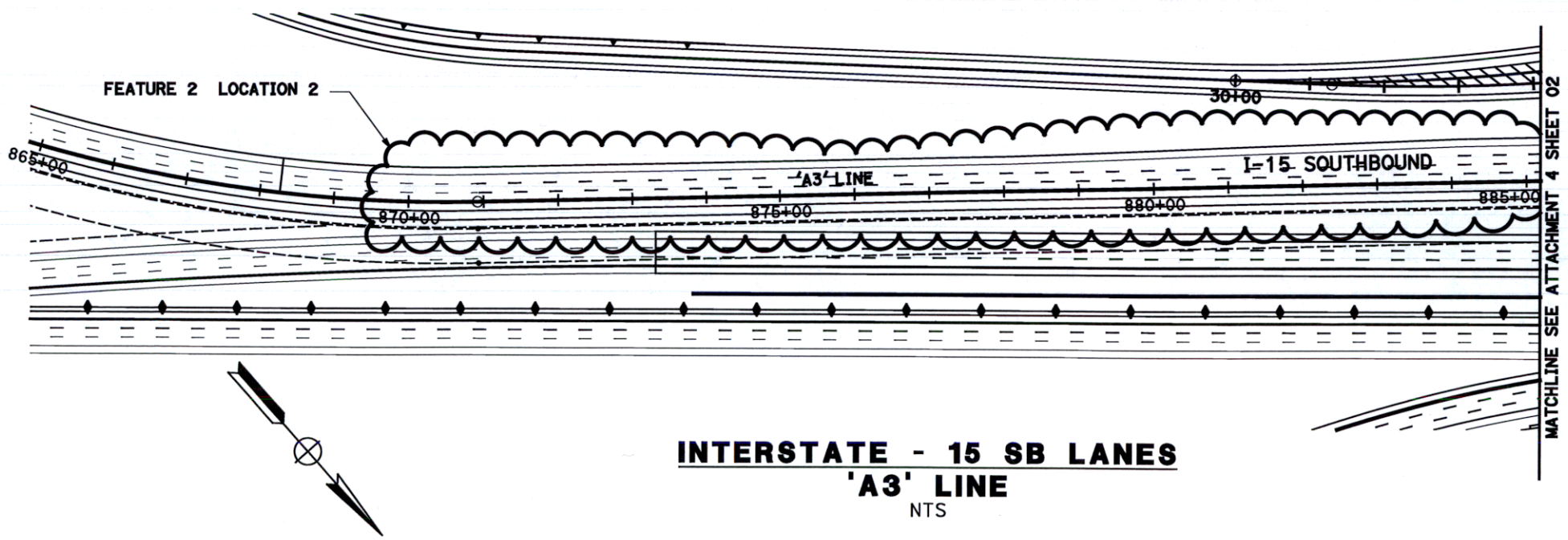

INTERSTATE - 15 SB LANES
'A3' LINE

NTS

FEATURE 2 LOCATION 2

MANDATORY DESIGN EXCEPTION ATTACHMENT 4

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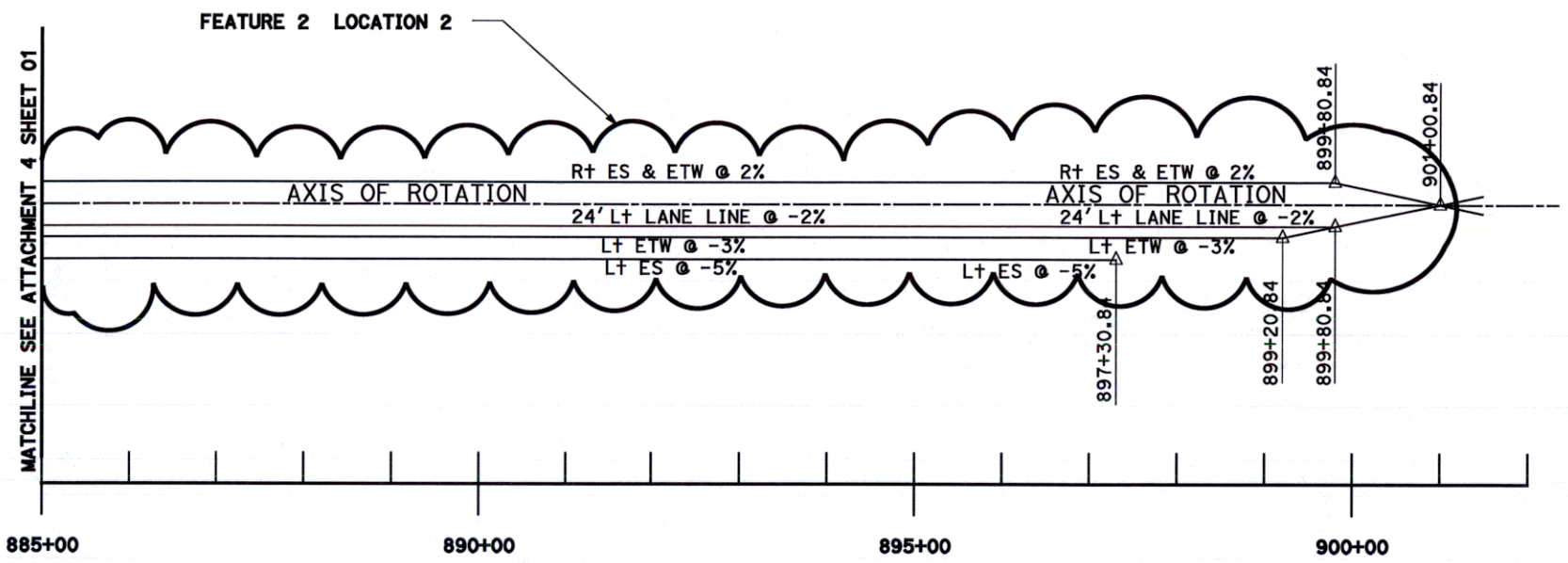

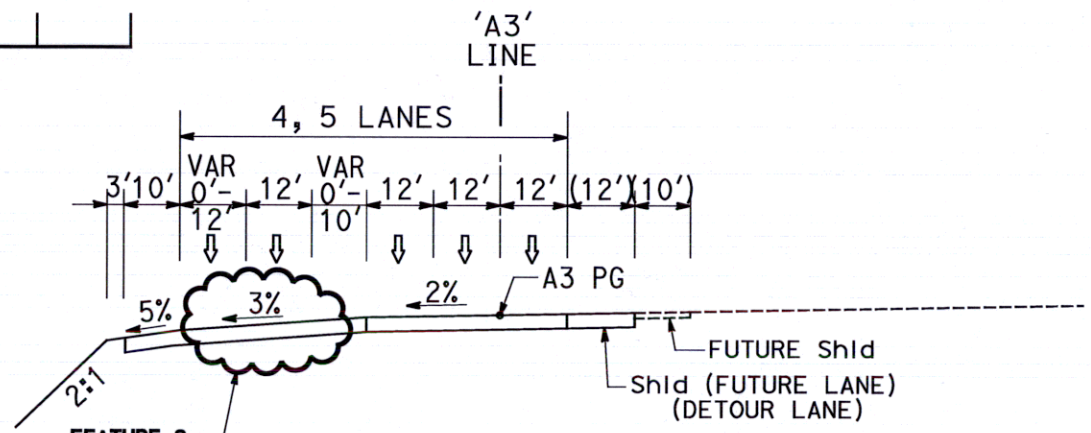

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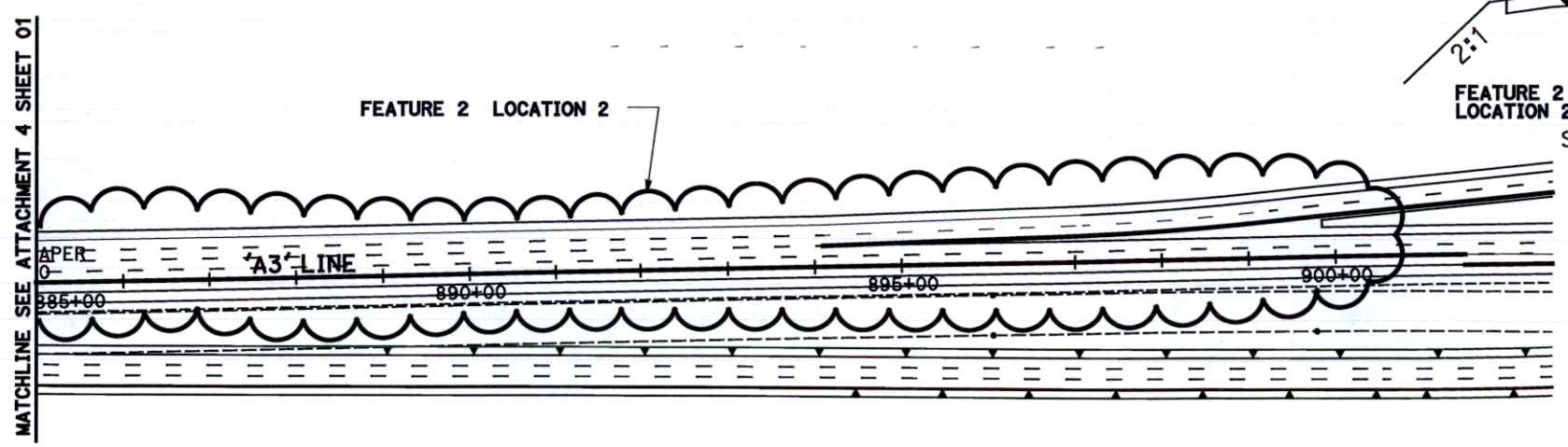

INTERSTATE - 15 SB LANES
'A3' LINE
NTS
FEATURE 2 LOCATION 2

MANDATORY DESIGN EXCEPTION ATTACHMENT 4
SCALE: NTS

SHEET 02

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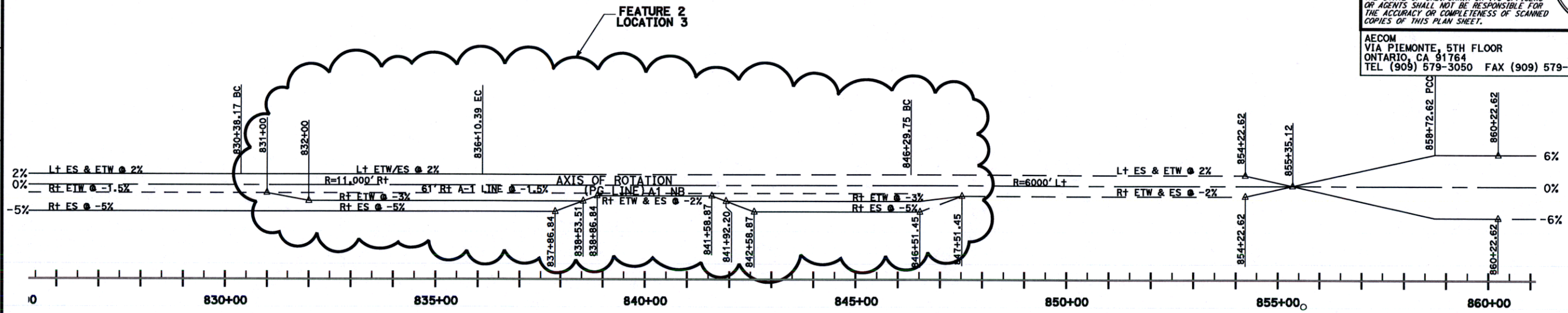

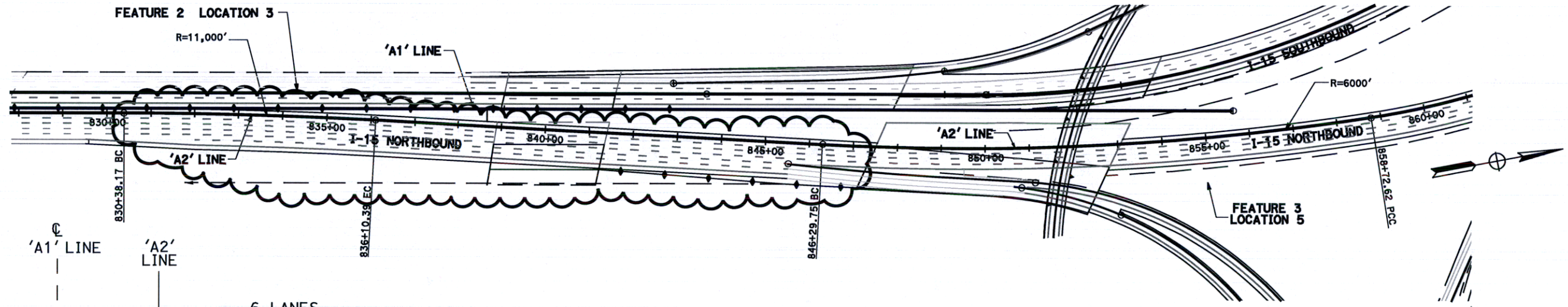

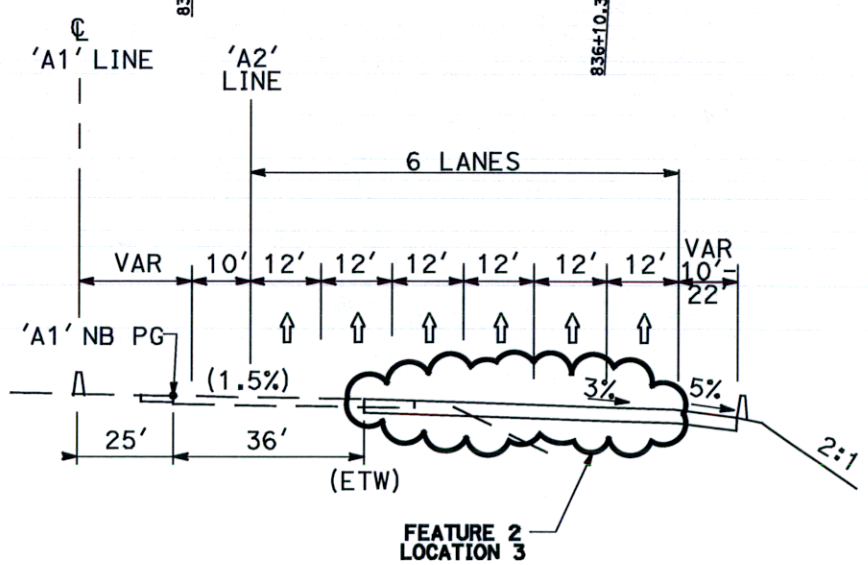

STA 832+00 TO STA 846+29.75 'A2'

INTERSTATE - 15 NB LANES
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FEATURE 2 LOCATION 3

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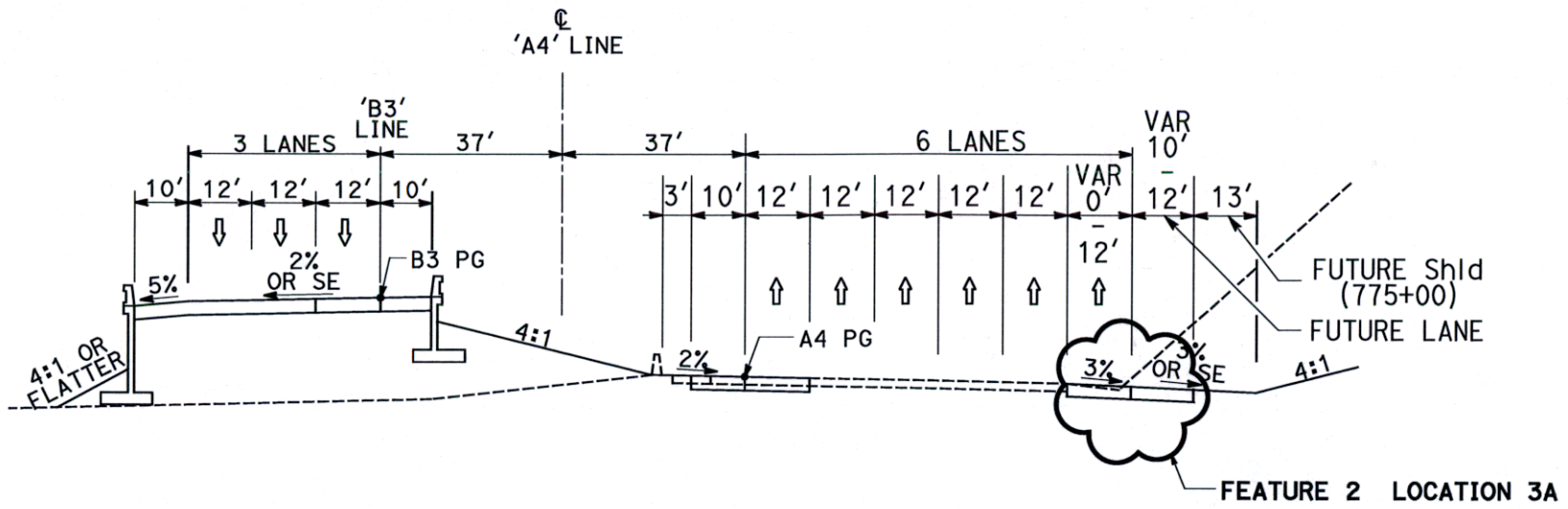

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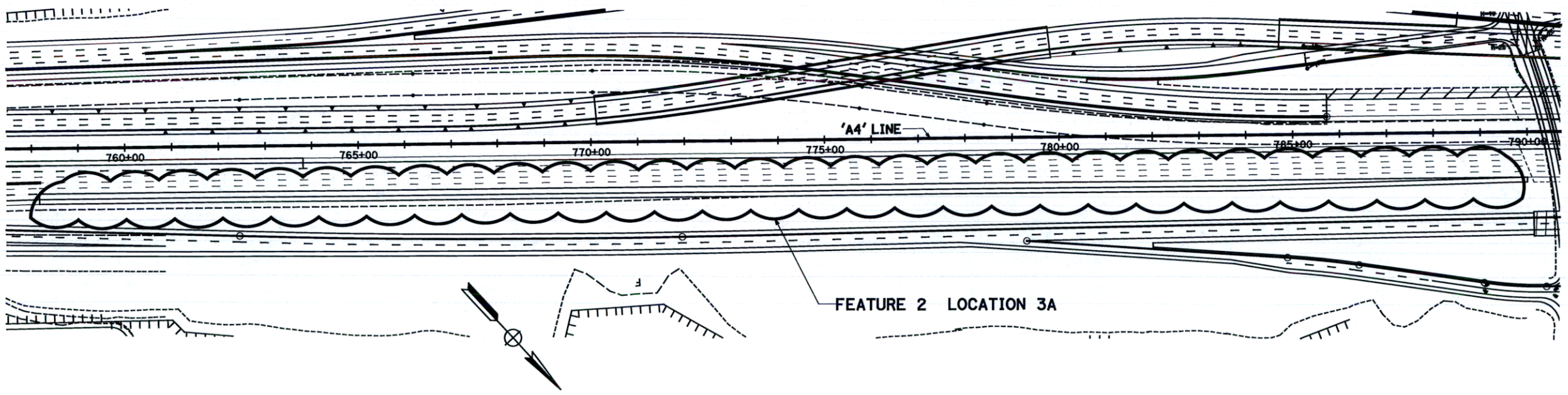

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SHEET 04

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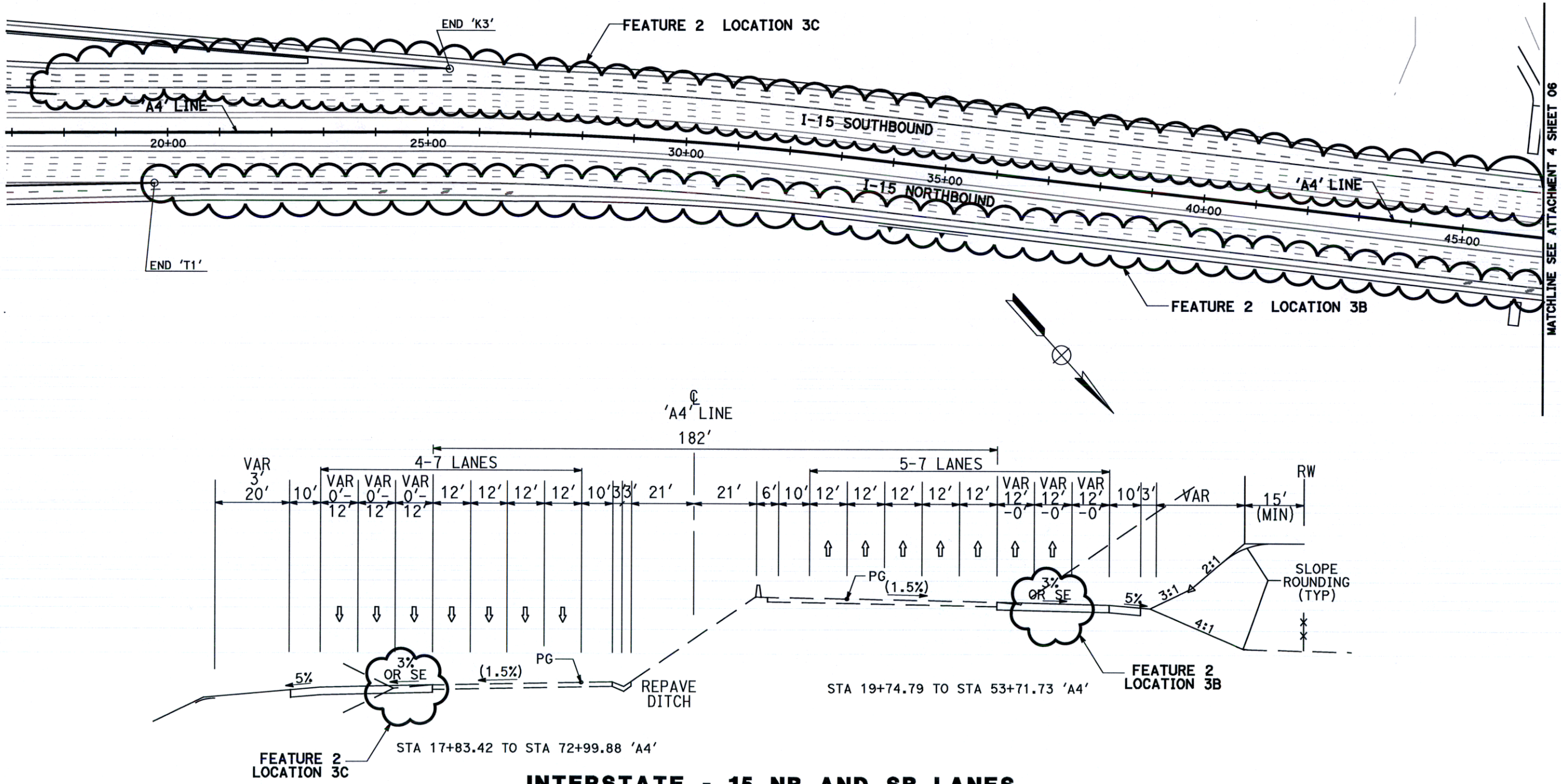

INTERSTATE - 15 NB AND SB LANES
'A4' LINE

NTS

FEATURE 2 LOCATIONS 3B AND 3C

MANDATORY DESIGN EXCEPTION ATTACHMENT 4

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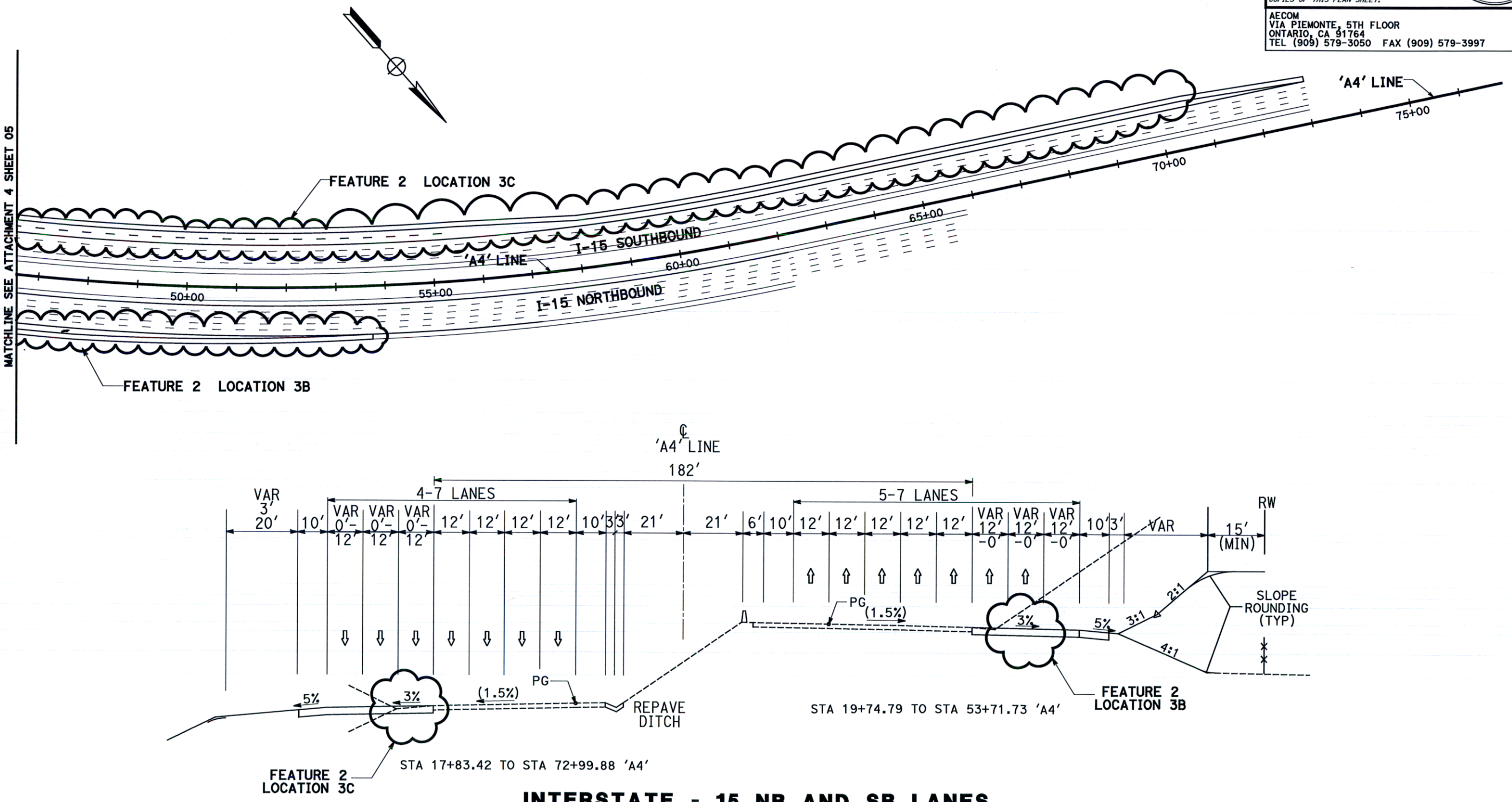

INTERSTATE - 15 NB AND SB LANES
'A4' LINE

NTS

FEATURE 2 LOCATIONS 3B AND 3C

MANDATORY DESIGN EXCEPTION ATTACHMENT 4

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SHEET 06

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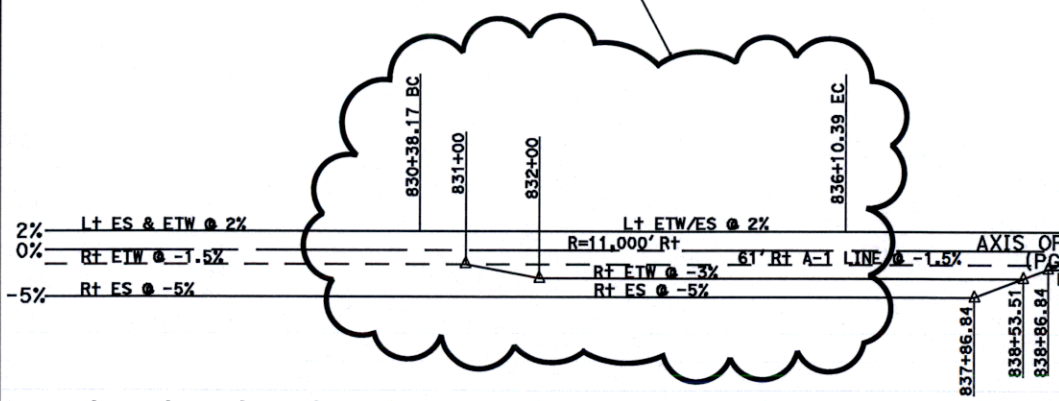

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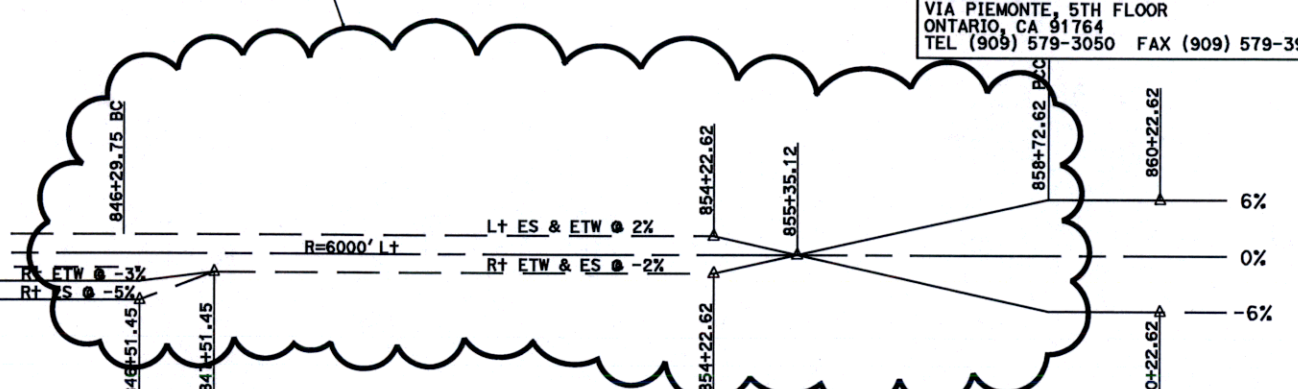

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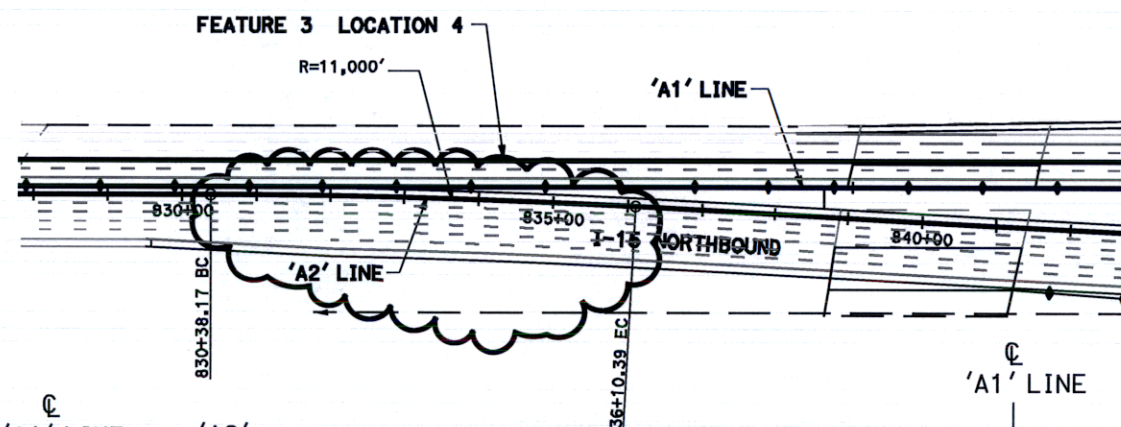
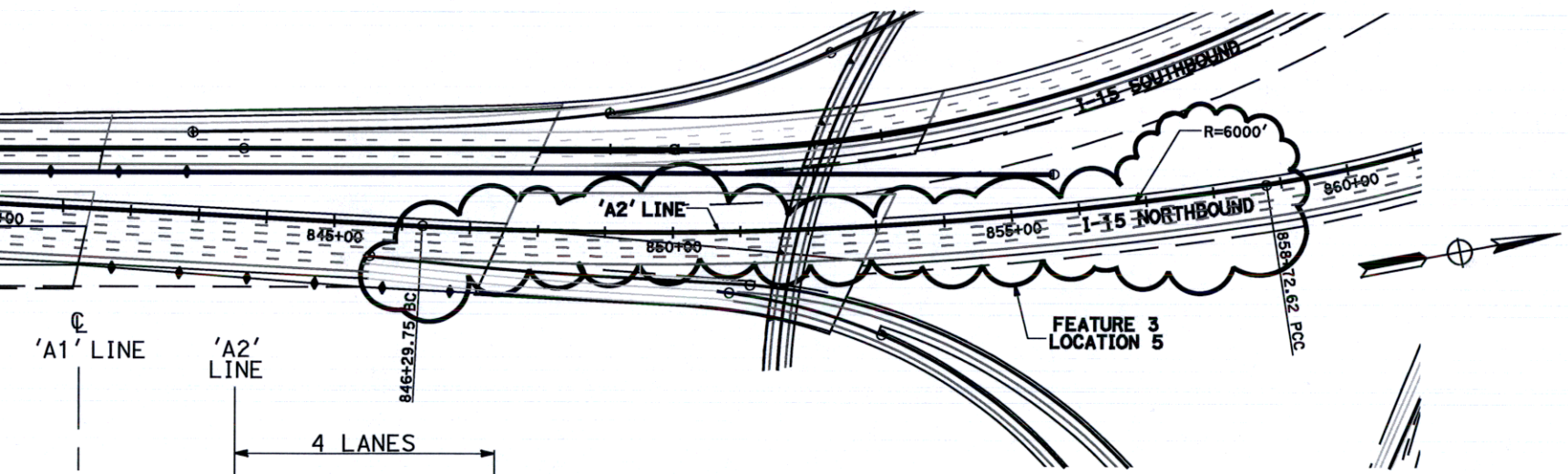
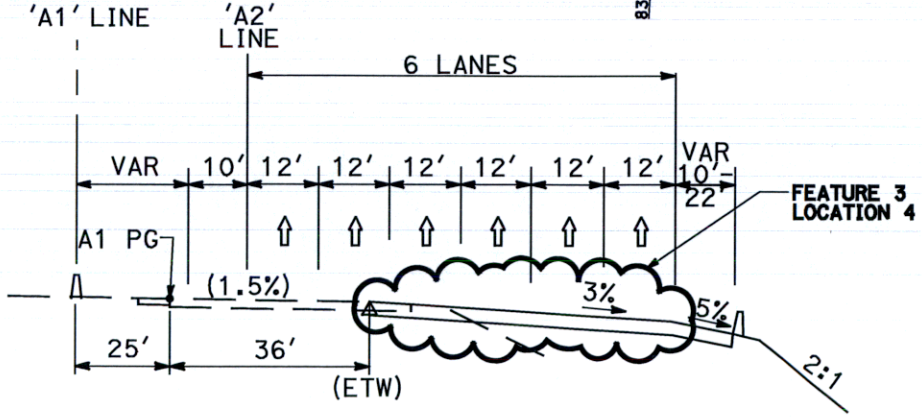
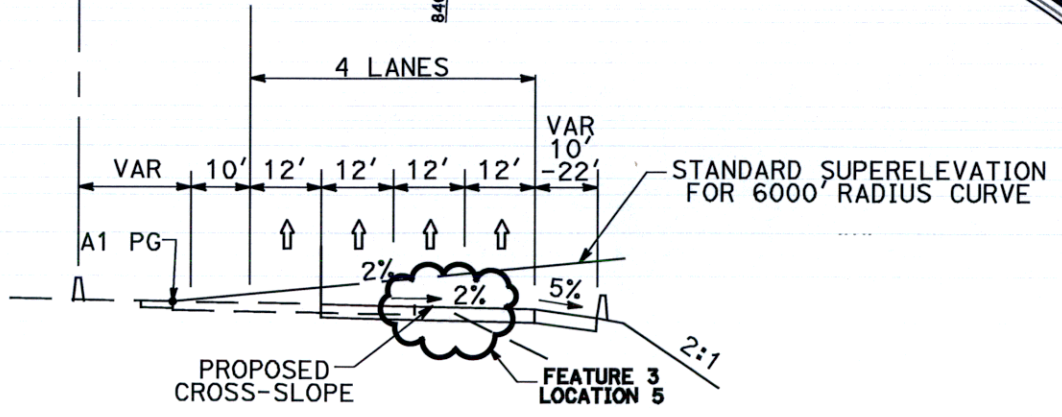






STA 830+38.17 TO 836+10.36 'A2'



STA 846+29.75 TO 858+72.62 'A2'

INTERSTATE - 15 NB LANES
'A2' LINE

NTS

FEATURE 3 LOCATION 4 AND 5

MANDATORY DESIGN EXCEPTION ATTACHMENT 5

SCALE: NTS

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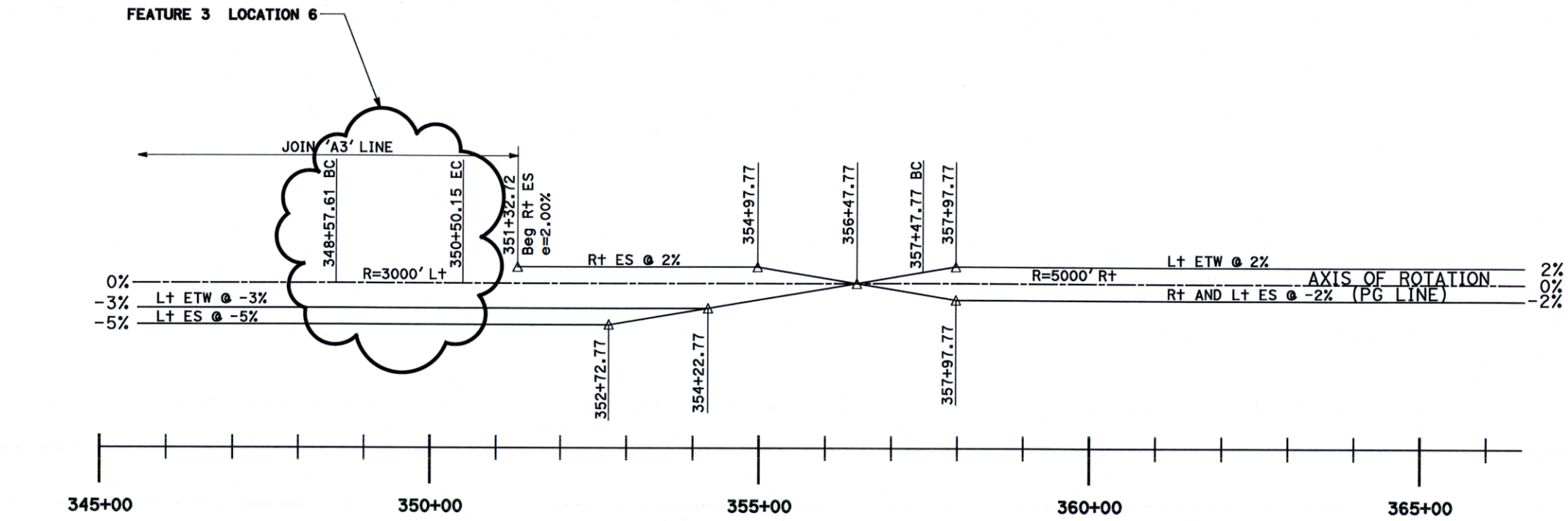

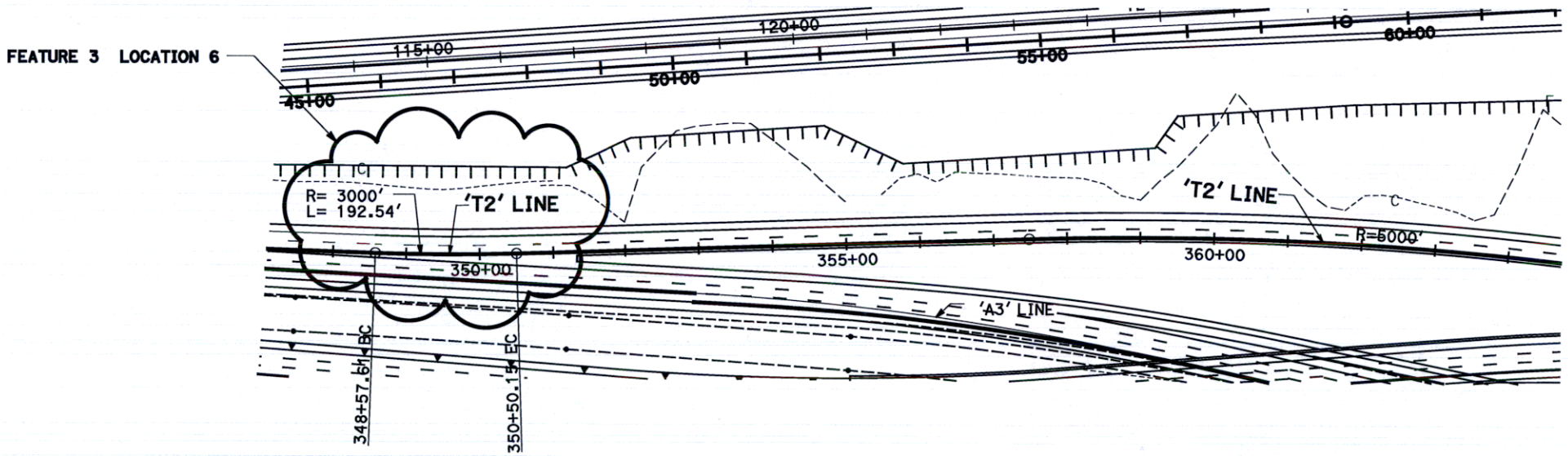

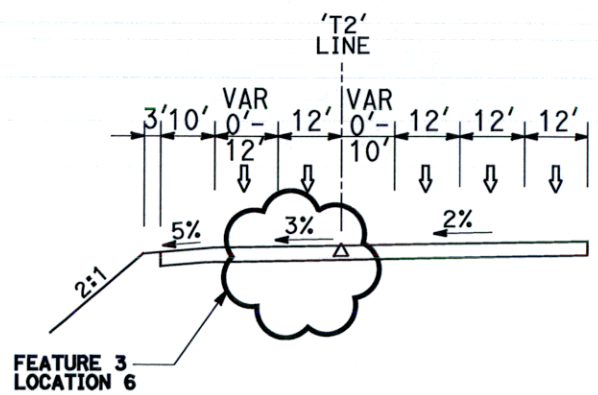

STA 348+57.61 TO STA 350+50.15 'T2'

INTERSTATE - 15 SB LANES
'T2' LINE
NTS
FEATURE 3 LOCATION 6

MANDATORY DESIGN EXCEPTION ATTACHMENT 5

SCALE: NTS

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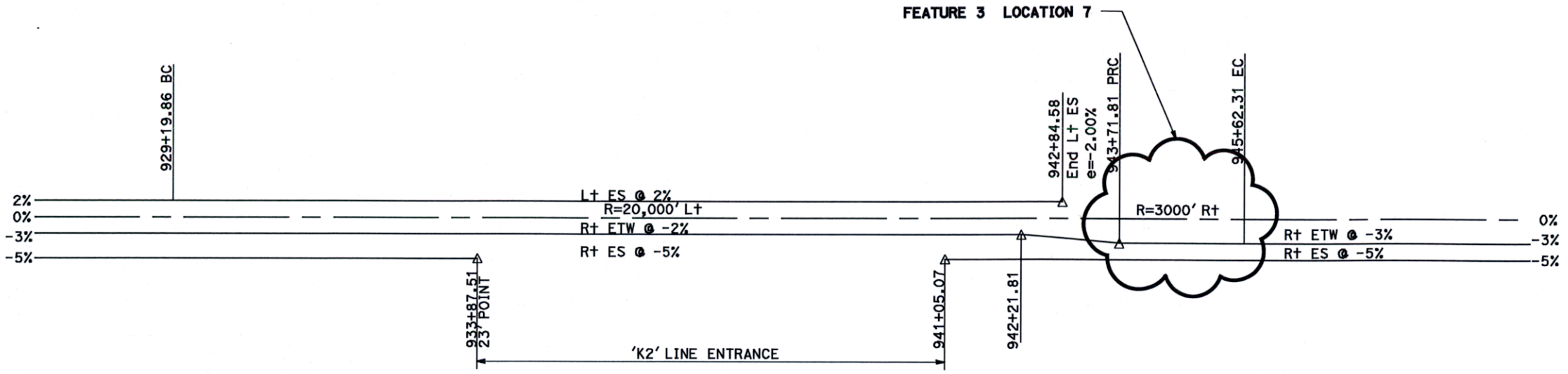
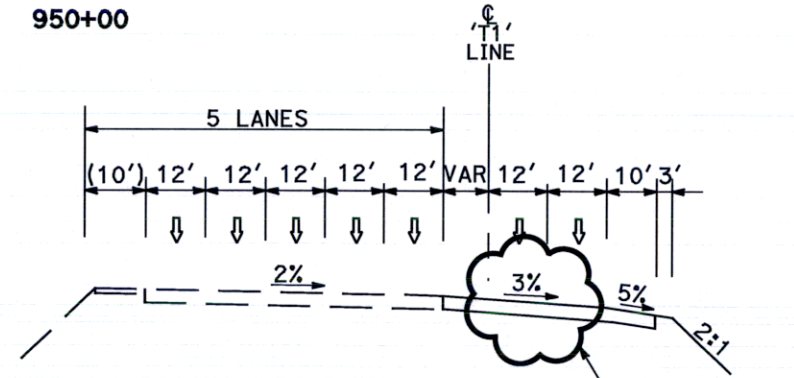
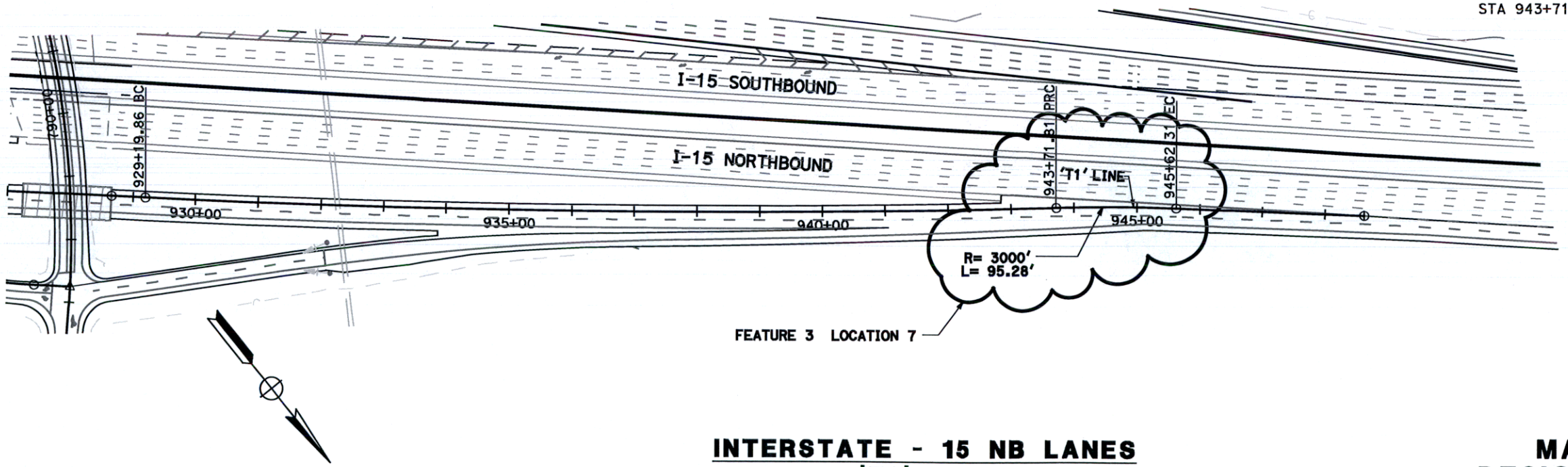
FEATURE 3 LOCATION 7





STA 943+71.81 TO STA 945+62.31 'TI'

FEATURE 3 LOCATION 7



INTERSTATE - 15 NB LANES
'T1' LINE

NTS

FEATURE 3 LOCATION 7

MANDATORY DESIGN EXCEPTION ATTACHMENT 5

SCALE: NTS

SHEET 03

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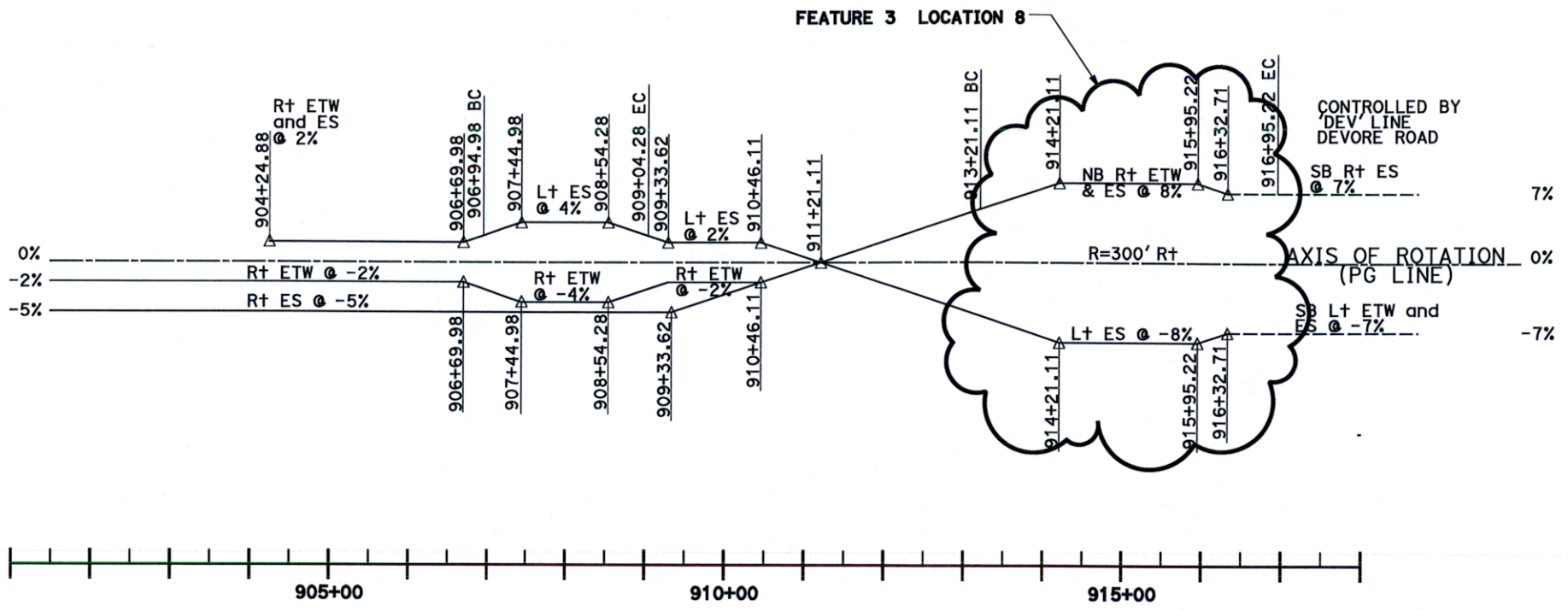

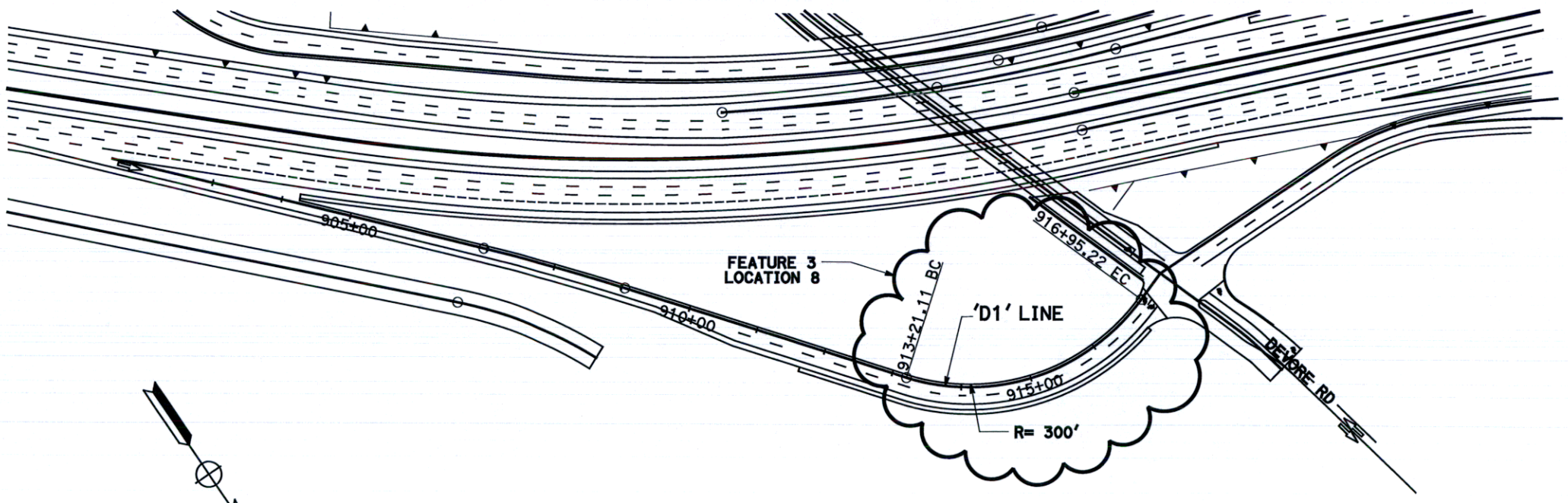

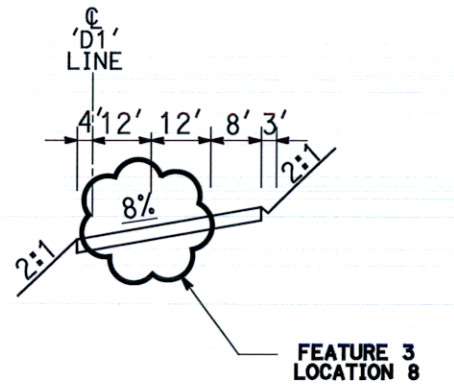

STA 913+21.11 TO STA 916+95.22 'D1'

INTERSTATE - 215 NB LANES
'D1 LINE
NTS
FEATURE 3 LOCATION 8

MANDATORY DESIGN EXCEPTION ATTACHMENT 5

SCALE: NTS

SHEET 04

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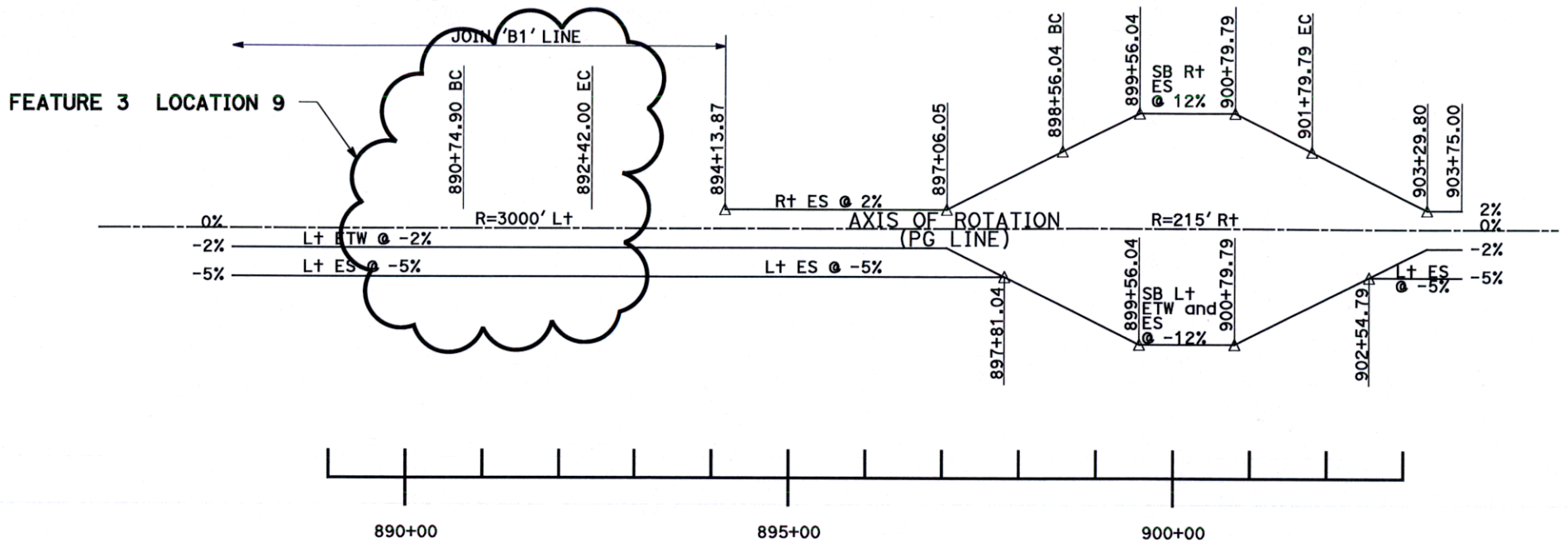
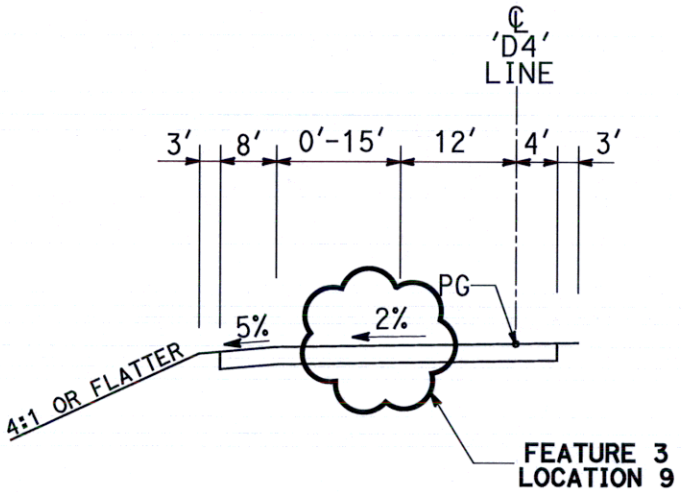
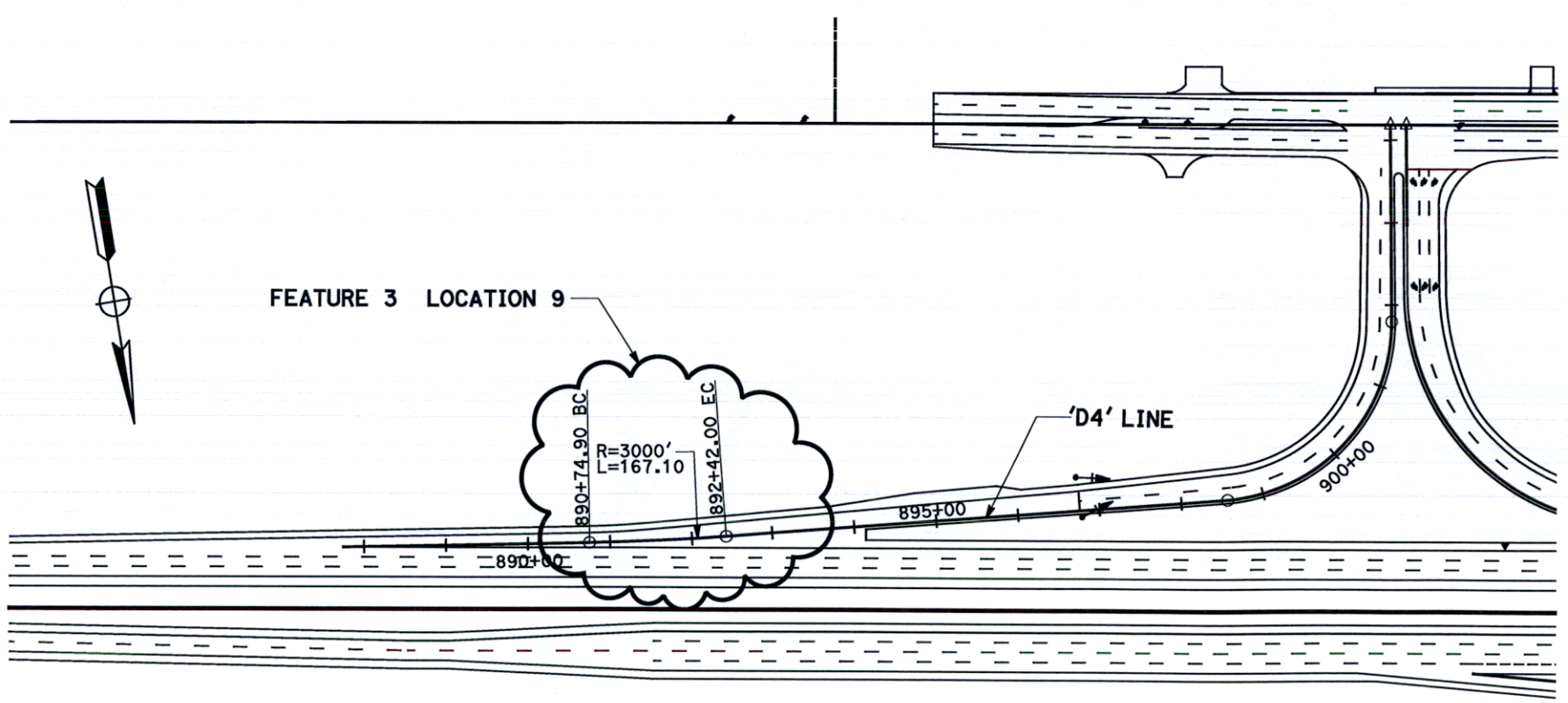




STA 890+74.90 TO STA 892+42.00 'D4'



INTERSTATE - 215 SD LANES
'D4' LINE

NTS

FEATURE 3 LOCATION 9

MANDATORY DESIGN EXCEPTION ATTACHMENT 5

SCALE: NTS

SHEET 05

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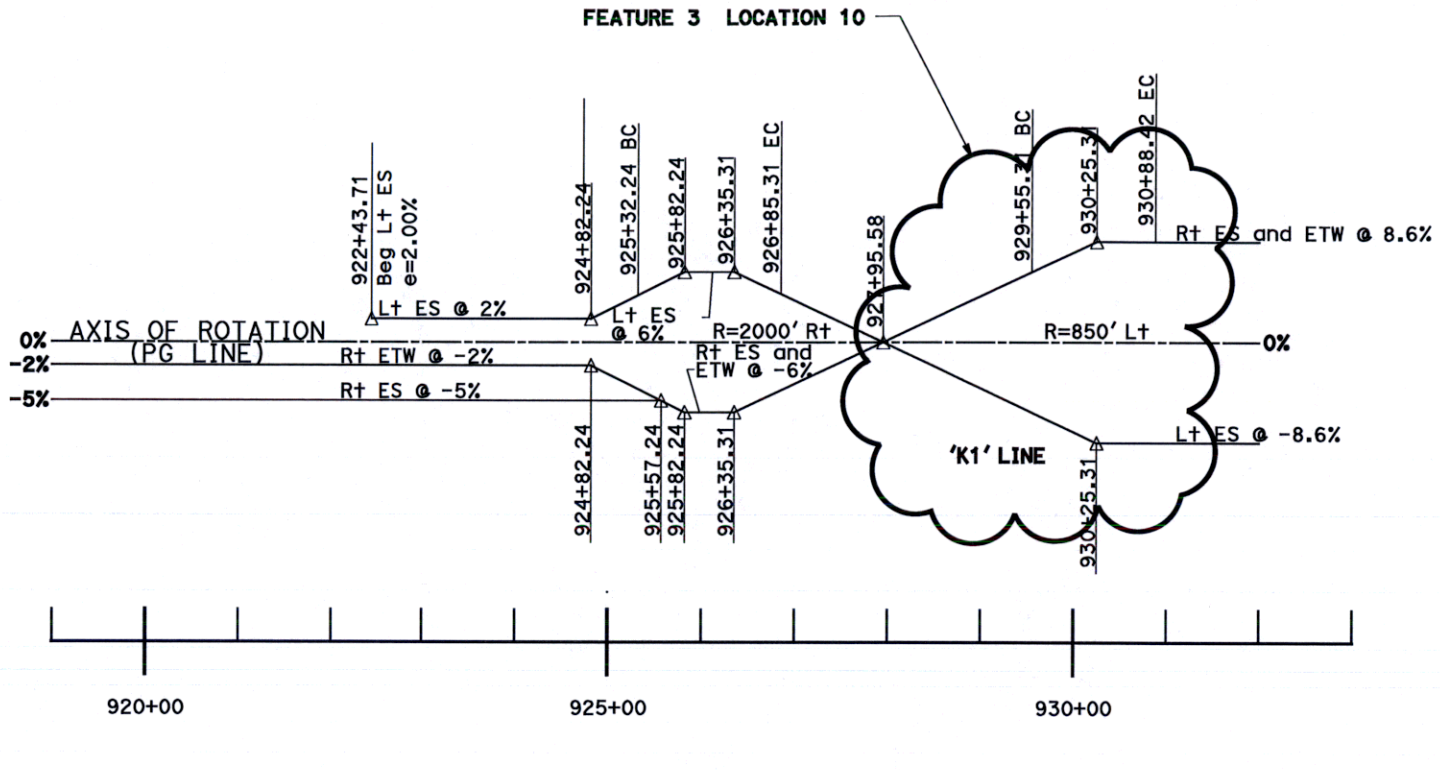
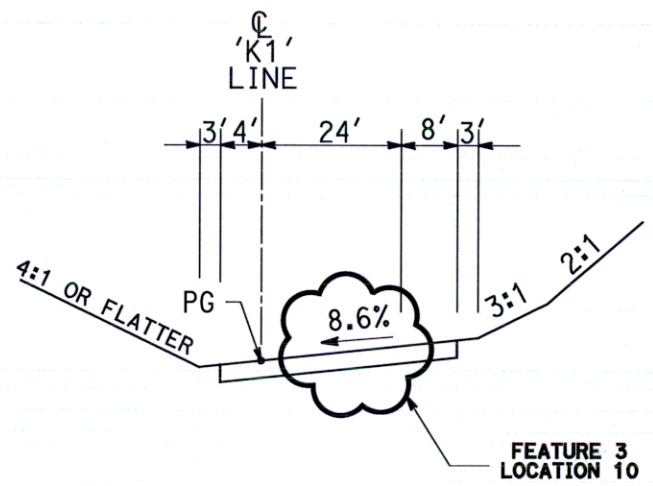
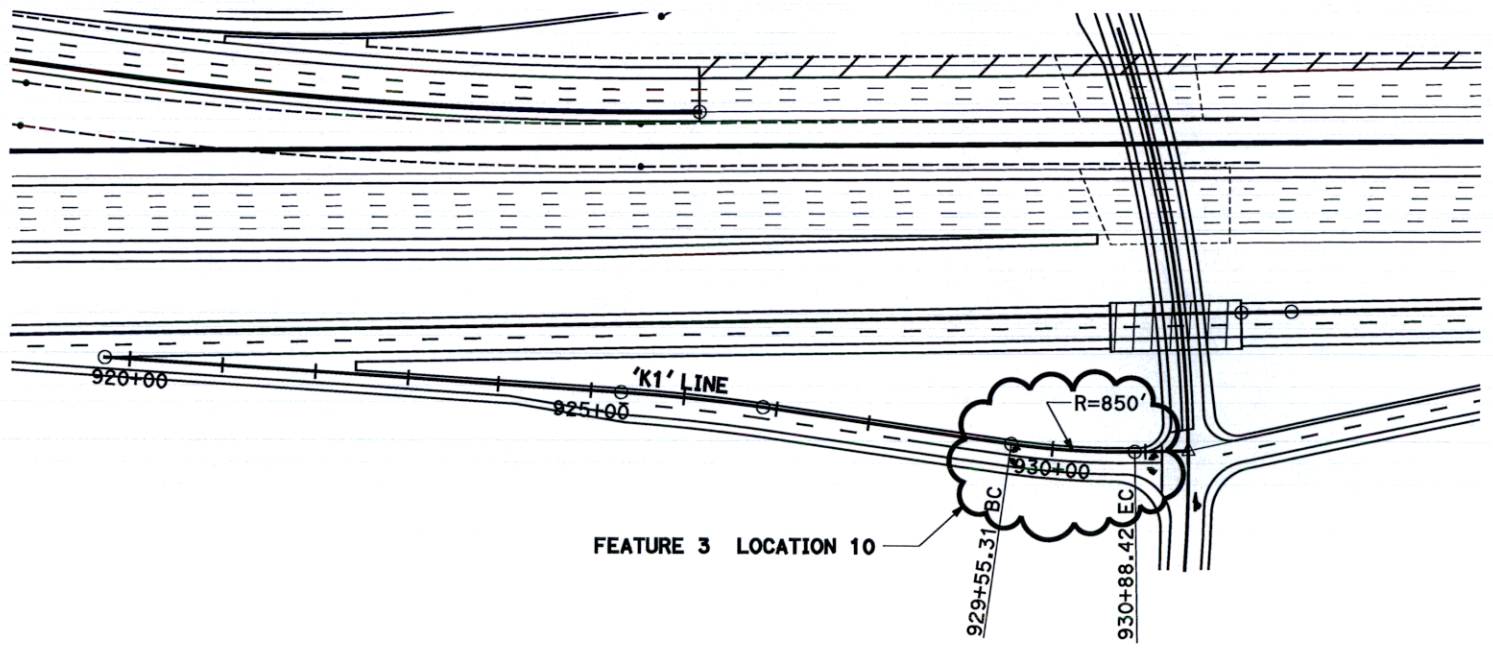




STA 929+55.31 TO STA 930+88.42 'K1'



INTERSTATE - 15 NB LANES
K1 LINE

NTS

FEATURE 3 LOCATION 10

MANDATORY DESIGN EXCEPTION ATTACHMENT 5

SCALE: NTS

SHEET 06

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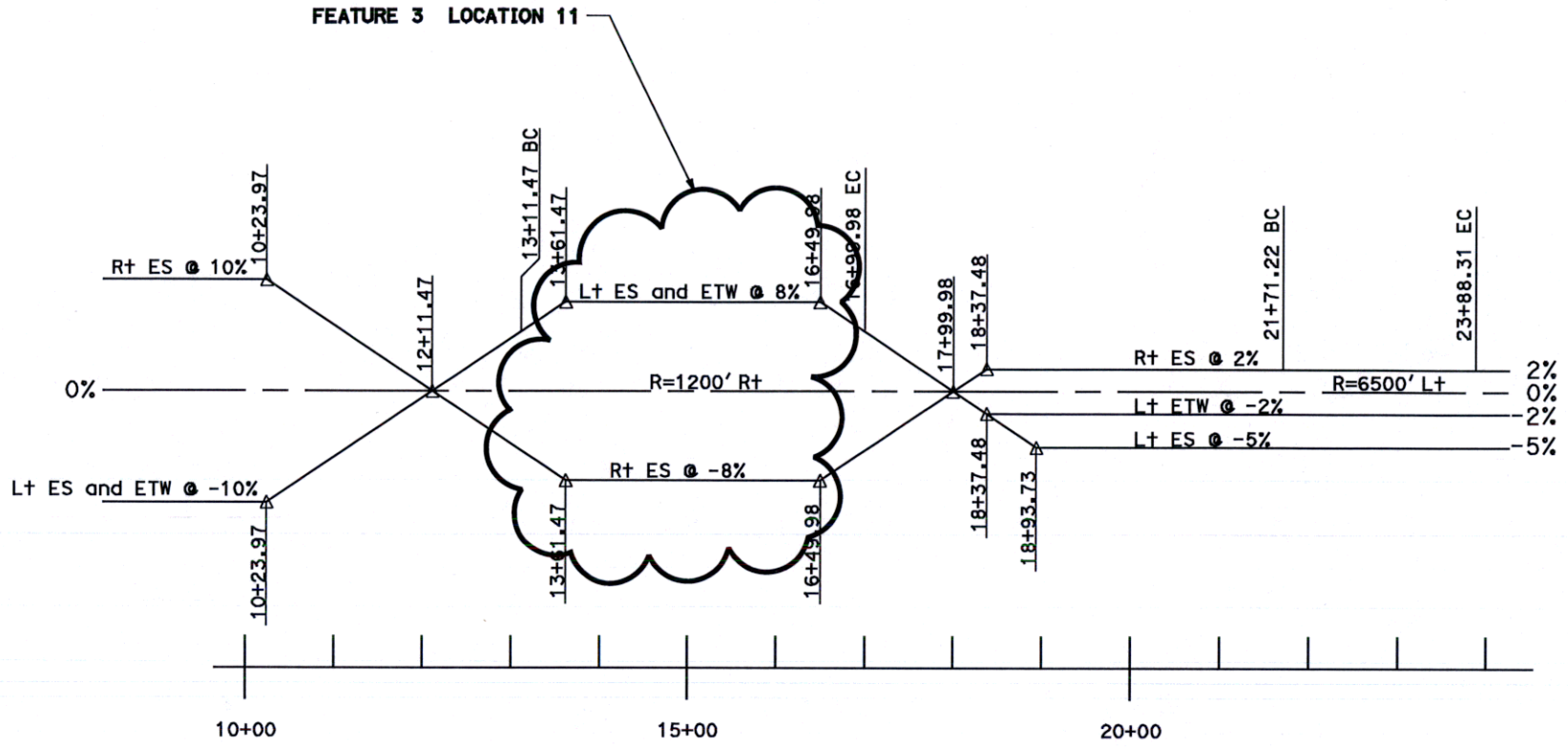

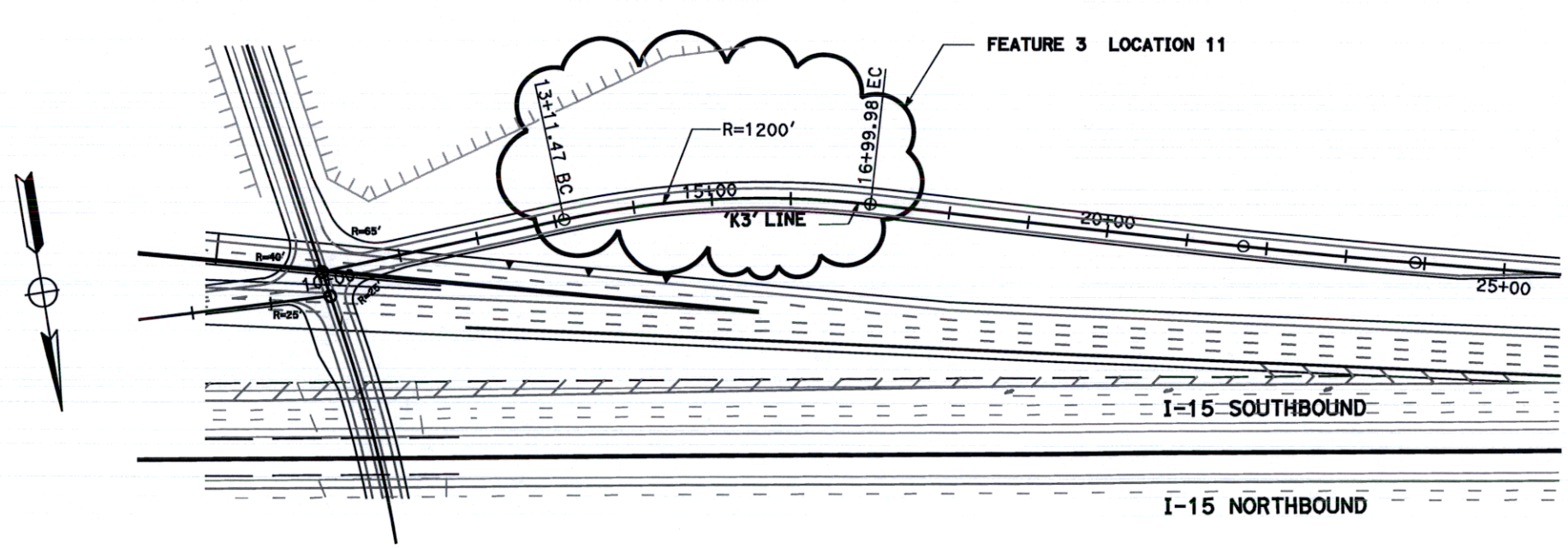

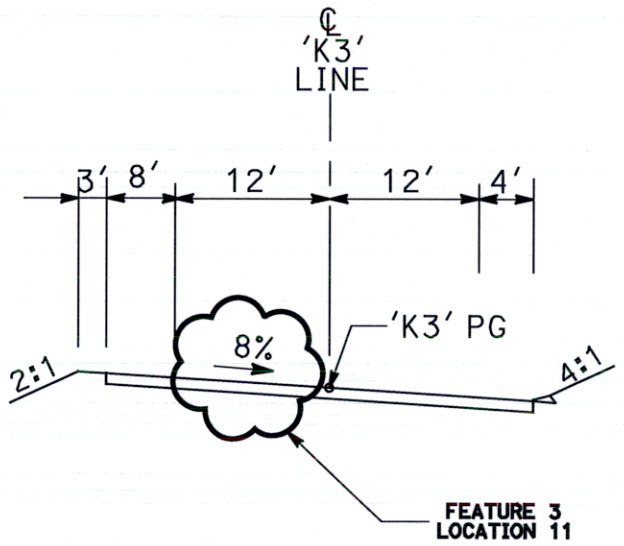

STA 13+11.47 TO STA 16+99.98 'K3'

INTERSTATE - 15 SB LANES
'K3' LINE

NTS

FEATURE 3 LOCATION 11

MANDATORY DESIGN EXCEPTION ATTACHMENT 5

SCALE: NTS

SHEET 07

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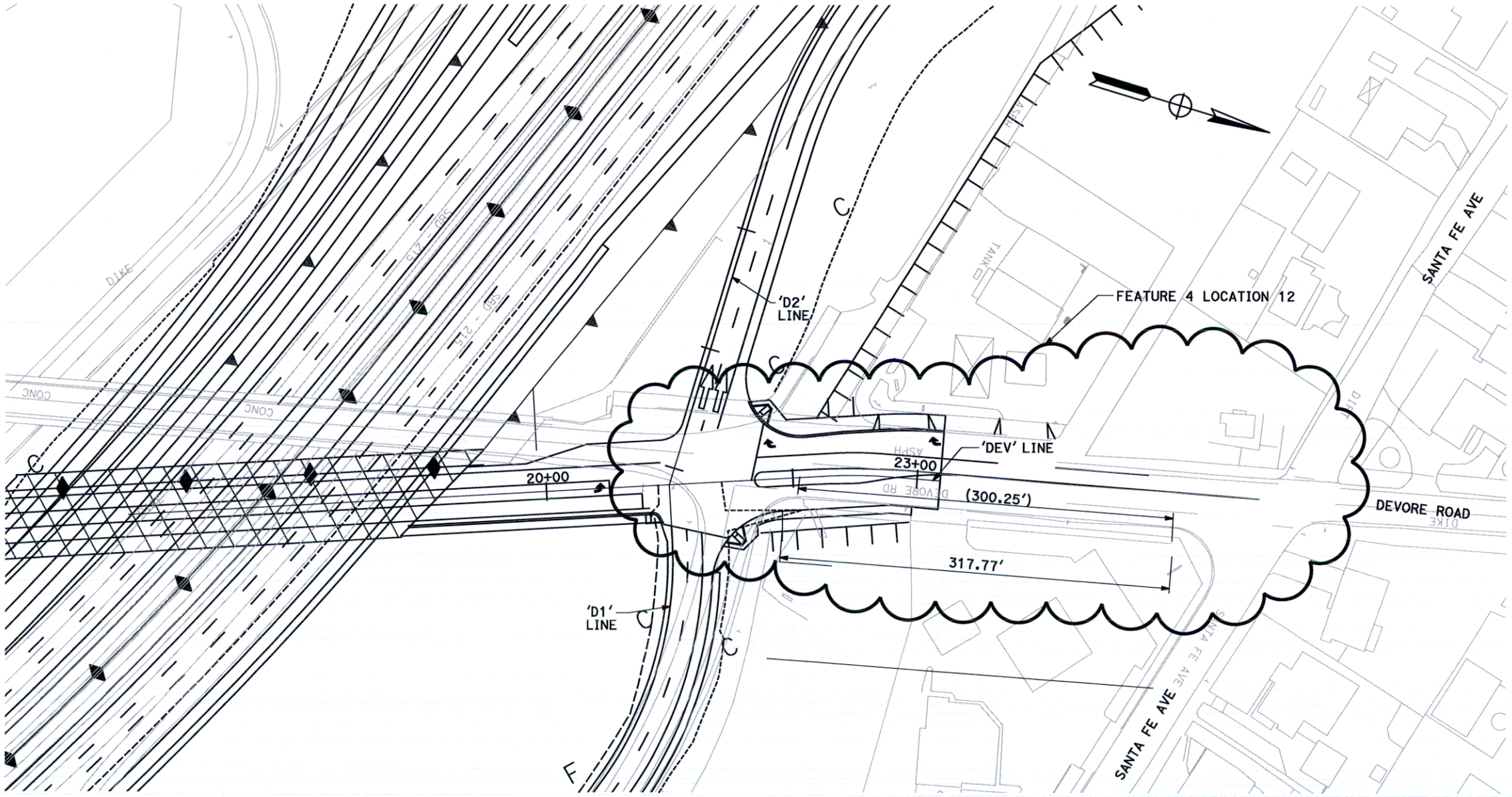

DEVORE ROAD
'DEV' LINE

NTS

FEATURE 4 LOCATION 12

MANDATORY DESIGN EXCEPTION ATTACHMENT 6

SCALE: NTS

SHEET 01

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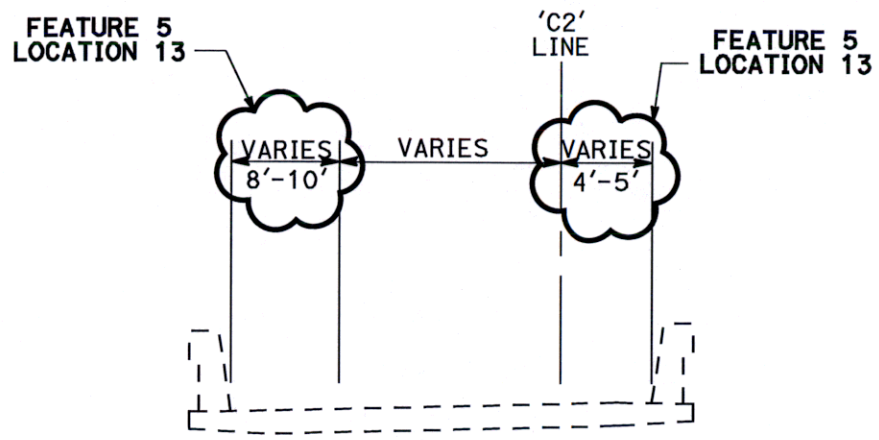
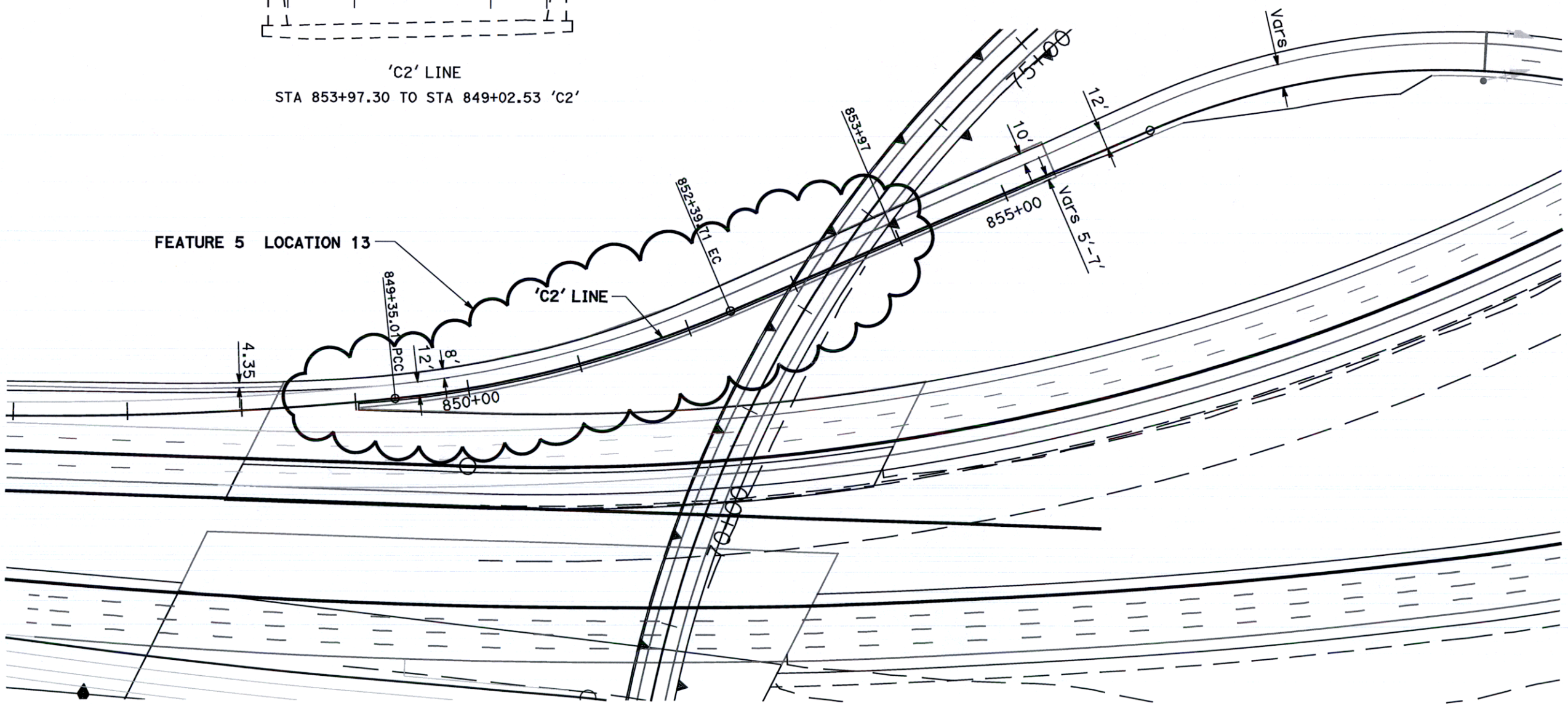


'C2' LINE

STA 853+97.30 TO STA 849+02.53 'C2'



INTERSTATE - 15 SB LANES
'C2' LINE

NTS

FEATURE 5 LOCATION 13

MANDATORY DESIGN EXCEPTION ATTACHMENT 7

SCALE: NTS

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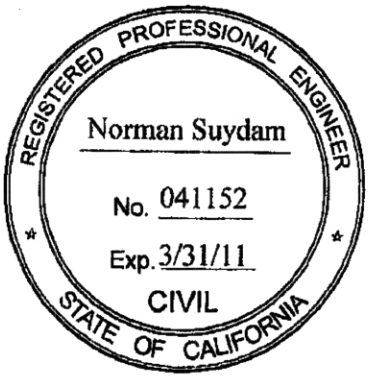
EA 08-0K7100
I-15/I-215 Interchange
February 2010

Fact Sheet Exceptions to Mandatory Design Standards



Prepared by:

Norman Suydam, P.E. — 06/29/10 Date
Project Engineer
AECOM

Submitted by: for Dennis Saylor — 6/29/10 Date — (909) 889-8611 Telephone
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Design

Concurred by:
Christy Connors — 6/30/10 Date — (909) 383-7582 Telephone
District 8, Deputy District Director
Design/Engineering Services

Approved by:
Luis Betancourt — 7/1/10 Date
Design Coordinator
HQ Division of Design

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1. PROPOSED PROJECT

1.1. Proposed Project Description

San Bernardino Associated Governments (SANBAG), in cooperation with California Department of Transportation (Caltrans) proposes to reconfigure Interstate 15/Interstate 215 (I-15/I-215) Interchange near Devore (unincorporated area), County of San Bernardino, CA. These sections of highway are access controlled Interstate Freeways adopted by the California Transportation Commission (CTC) in 1969. The purpose of the proposed project is to eliminate congestion, reduce accidents, restore route continuity for I-15, construct truck By-Pass, and improve non-standard weaving between interchanges. Three alternatives were considered ranging from $350 million to $437 million. Project funding is anticipated to be a combination of State, Federal, Local and Measure I funds. The support cost of the PA & ED is estimated to be $3.5 million.

1.2. Existing Highway

Interstate 15 crosses between the San Gabriel and San Bernardino Mountains in an area known as the Cajon Pass. The Cajon Pass area encompasses approximately twelve miles of freeway from Sierra Avenue in Fontana to Oak Hills Road just past the Cajon summit in the Hesperia area.

I-15 is a major south/north route through Riverside and San Bernardino Counties. I-215 branches from I-15 in Temecula in Riverside County just north of San Diego County line. The I-15 proceeds north through the cities of Norco and Corona before entering San Bernardino County through the cities of Ontario, Rancho Cucamonga, Fontana and Rialto. I-215 ultimately reconnects with I-15 in Devore area in San Bernardino County. Separation between I-15 and I-215 corridors is generally about fifteen to twenty miles. I-15 provides one of two south/north links with the National Interstate Network in the Riverside and San Bernardino areas.

Within the project limits, I-15 consists of four mixed flow lanes in each direction from Route 66 to Glen Helen Parkway , three mixed flow lanes in each direction from Glen Helen Parkway to I-215, four mixed flow lanes northerly of the junction with I-215, and one truck climbing lane in the northbound direction only.

Interstate 215 is a major route between Temecula and Devore in Riverside and San Bernardino Counties.. I-215 begins in Temecula following an old alignment of U.S. Route 395 through Riverside County, passing through Riverside and San Bernardino, and ending at the junction with I-15 in Devore. Within the project limits, I-215 consists of two through mixed flow lanes in each direction.

NORTH JUNCTION OF I-15/I-215

This junction is basically a "Y" type of system interchange that was constructed in the late 1960s with the alignment towards San Bernardino being the primary move and the southwesterly leg being the diverging route. Because of this, the design standards for the diverging route are less than mainline standards for an Interstate. Currently, the design speeds for the I-15 southwest leg to the Northwest leg in the NB direction is greater than 80 mph based on the vertical alignment, but is about 69 mph based on the horizontal alignment, while SB direction is 67 mph (vertical) and 69 (horizontal). Therefore, the existing minimum design speeds are less than the desired design standard for an Interstate mainline. The construction of this interchange retained a connection to Devore Road (Glen Helen Parkway) on the I-215 leg which was less than the current standard of a two mile spacing between a system interchange and a service interchange. Along the I-15 alignment, interchanges were made at Kenwood which is slightly less than two miles from the system interchange and a local interchange with Glen Helen Parkway to the south, which also is slightly less than the two mile spacing.

1.3. Safety Improvements

Many of the design elements in the project improve current non standard features, provide additional capacity or make operational improvements that will have an impact to improve safety for the freeway.

The following improvements provided by this project will enhance safety:

- Add truck bypass lanes through the interchange to eliminate difficult auto/truck weaving conflicts.
- Rebuild the I-215/Devore Road Interchange to eliminate non-standard geometric features.
- Reconfigure the existing I-15/Kenwood Avenue interchange to eliminate non-standard geometric features.
- Eliminating the freeway mainline weaving areas: NB I-215 at Devore Road, NB and SB I-15 between I-215 and Kenwood Avenue.

Northbound I-15

- Adding a northbound mainline line between the Glen Helen Parkway off-ramp and the I-215 junction to reduce congestion.
- Adding a northbound auxiliary lane between the Glen Helen Parkway on-ramp and the I-215 junction to improve operation.
- Construct auxiliary lanes to provide for weaving traffic.
- Widen existing Northbound I-15 to Northbound I-15 Connector to add one lane and allow for passing of slower traffic.

Southbound I-15

- Adding a southbound mainline lane between the I-215 junction and the Glen Helen Parkway on-ramp to provide additional capacity.
- Adding a southbound auxiliary lane between the I-215 junction and the southbound Glen Helen Parkway off-ramp to improve operation of the freeway.
- Add auxiliary lanes to provide for merging and diverging traffic.
- Southbound I-15 and I-215 will braid with each other in order to provide route continuity and eliminate a left hand exit ramp.

Northbound I-215

- Construct one additional northbound lane to provide needed capacity.
- Reconfigure the northbound on-ramps at Devore Road to eliminate a loop on-ramp with high accident rate.
- Realign northbound off ramp at Devore Road to make alignment standard.
- Construct Northbound I-215 truck bypass to eliminate auto/truck weaving conflicts.

Southbound I-215

- Reconfigure and add one additional lane to the southbound connector to provide needed capacity.
- Braid the Northbound I-15 to Southbound I-215 connector and the Southbound Devore Road off ramp to eliminate a short weaving area along a CD road.

- Reconstruct southbound off ramp and on ramp approximately 500 feet southerly of the proposed intersection of Glen Helen Parkway with Devore Road to improve geometry.

1.4. Total Project Costs

The total estimated project cost within the project limits consists of (1) construction cost, (2) right-of-way acquisition cost and (3) Support Cost as follows:

(1) Construction Cost:	Alt 3A
Roadway	$187,391,000
Structure	$54,500,000
(2) Right-of-Way Acquisition Cost: (including utility relocation)	$47,937,240
(3) Support Cost: (Permits and Mitigation Expenses)	$24,688,280
Total Project Capital Cost:	**$314,517,000**

2. FEATURES REQUIRING AN EXCEPTION

There are twenty-two locations that require mandatory design exceptions (Refer to Attachment 2, Key Map of sheet locations for Mandatory Design Exceptions).

2.1. Design Exception Feature #1 – Stopping Sight Distance (Vertical Curve)

Nonstandard Features (refer to Attachments 4, & 17):
A short vertical curve is used at Location 1 with Stopping Sight Distance (SSD) less then the required.

Location	Attachment #	Line	From Station	To Station	Provided			Required		
					SSD (ft)	Speed mph	VC Length (ft)	SSD (ft)	Speed mph	VC Length (ft)
1	4 & 17	A3	850+00.00	856+00.00	671	67	600	930	80	1152

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 201.1 - Sight Distance - General
"Table 201.1 shows the standards for stopping sight distance related to design speed, and these shall be the minimum values used in design."

Reasons for Requesting Exception:
Location 1 - The existing southbound I-15 mainline where it crosses over Cajon Creek (4 & 17)
This section of I-15 mainline, where it crosses over Cajon Creek, has been an existing condition for approximate about 40 years with accident rates that are below average (see Table 4 for the southbound mainline accident data, PM 12.500 to 16.373). To make Location 1 standard would involve rebuilding of the existing bridge and rebuilding the roadway on either side of two bridges between Station 850+00.00 and 870.+20.96. A complete

redesign of the vertical realignment would be required. A longer crest vertical curve of 1152 feet will be required for 80 mph design speed which will cause the 600 feet sag vertical curve northerly of the non standard crest vertical curve to be moved about 288 feet northerly causing a new profile grade to be approximately 5 feet higher than the existing roadway and bridge over the C2 line which will have to be replaced To accomplish these changes either a new bridge over Cajon creek would be needed on a lower profile with the longer vertical curve requiring a complete replacement of the structure. Or another option is for the northerly portion of the bridge to have an overlay on the bridge deck holding the BVC at station 850+00 and sliding the VC to the north. It is unsure if the bridge is structurally capable of carrying this concrete overlay considering it will be over 24" thick at the north end of the bridge. This roadway is the 3 SB mainline lanes of I-15. It is not possible to close or reduce the number of these lanes so any new vertical alignments will have to be constructed first on a new horizontal alignment greatly increasing the cost of construction, right of way and environmental impacts. Therefore a longer VC will not work at this location without these replacements in order to increase the provided speed by 13 mph. The provided speed of 67 mph is higher than the posted speed of 70 mph for this facility. It is not reasonable to rebuild the bridge and portion of the roadway where the actual accident rates (see Table 4) are lower than the average for a similar roadway facilities.

Added Cost to Make Standard:
Location 1 - The cost to make standard is estimated at $11.25 million which includes the cost of the roadway which is $1.5 million and the cost of the structures is $9.75 million. These additional costs represent 4.7 % of the total project construction cost.

2.2. Design Exception Feature #2 – Horizontal Alignment (Minimum Radius)

Nonstandard Features (refer to Attachments 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14 &15):

Location #	Attachment #	Line	Location Description	BC Station	EC Station	Radius (ft)	Standard Radius (ft)
1	3, 13	CD	Off-Ramp	925+26.89	934+42.28	757	850
2	4, 6, 7	A3	SB I-15	850+12.23	871+04.70	2012	3900
3	5, 8, 9	A2	NB I-15	857+09.70	882+40.57	2000	3900
4	5, 6, 14, 15	C2	Connector	856+42.14	872+73.31	650	850
5	9	A2	NB I-15	886+01.19	890+83.74	2000	3900
6	9	A2	NB I-15	890+83.74	892+50.82	3000	3900
7	11, 12	B1	I-215 Mainline	904+29.17	915+20.43	2999	3900

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 203.2 - Standards for Curvature
" Table 203.2 shall be the minimum radius of curve for specific design speeds."

Reasons for Requesting Exception:
Many of the locations where an exception has been requested, has a curve radius less than 3900 feet or 850 feet for mainlines and connector ramps respectively. The request for these design exceptions is primarily to reduce impact to the surrounding community, right of way acquisition and environmental habitat; and cost. A number of the existing alignments have a history of accident rates that are lower than the statewide average for a similar section of highway. Some of the new alignments, which are non-standard, are the result of other geometric constraints in this area that result in these exceptions.

Location 1 – CD line, Northbound I-15 off ramp to Devore Road (3 &13)
The C1 line has an 850 foot radius. The CD line off-ramp has an 850 foot radius, compounds to a 757 foot radius immediately after the exit nose which is 93 feet less than the required 850 foot radius. This is required to permit the merge with the D3 line. The design speed of this particular radius is 47 mph which slightly less than 50 mph but is consistent with the crest vertical curve design speed noted in Design Feature Number 1. To achieve standard design, a considerable amount of additional bridge and roadway construction and right of way acquisition impacts on environmental habitat would be required. Making Line CD standard would require that the diverge from the I-15, at both Line CD and Line C1, be relocated further south. Since the Line CD diverge requires a distance of 600 feet between successive exits, increasing the horizontal curve radius for Line CD requires that Line C1 be moved further south. This would require a widening of about 35 feet of the Cajon Creek Bridge and a widening of about 12 feet of the railroad bridge located further south. Additionally, this would extend out the right of way acquisition approximately 40 to 50 feet impacting Cajon Creek, Glen Helen Park, San Bernardino Kangaroo Rat habitat and private properties.

Location 2 – A3 line, Southbound I-15 mainline (4, 6 & 7)
This is an existing alignment that was the south to west connector and was converted to be the SB I-15 mainline. About 25% of this alignment is on the bridge and possess common reasons for requesting exceptions. The actual accident rates in this area (PM 14.048) are lower than the statewide average for similar sections of highway. There will be a substantial cost savings by keeping the existing roadway opposed to a completely new alignment on a larger radius. This particular roadway would present the largest impact to the Cajon Creek right of way and habitat areas. Currently the radius is 2012 feet, however, if the full standard 3900 ft radius were constructed, the centroid of the curve would move approximately 300 feet further into the streambed, requiring additional embankment, bridge, right of way acquisition and environmental impacts. To make Line A3 (Location 2) standard, the pavement along SB I-15 would need to be realigned in addition to replacing Cajon Creek Bridge Left. The W-S Connector merge must be moved further south with a new separate bridge and Devore Overhead Left widen outside for the lane merge of the W-S Connector. It would be impractical to spend $47 million to improve this curve and impact the Creek where there is no accident issues.

Location 3 – A2 line, Northbound I-15 roadway (5, 8 & 9)
This is an existing alignment that was the east to north connector and was converted to be the NB I-15 mainline. This particular alignment is being widened in order to utilize the existing pavement and more importantly the bridge structure that spans over the B2, B3 and C2 alignments. The accident data for this particular roadway (PM 14.273) is substantially below the average accident rate for this type of facility. For this location, realigning Line A2 involves new pavement along I-15 NB, replacing Cajon Creek Bridge Right and Route 215/15 Separation Bridge. Additionally, I-15 SB will have to be realigned also involving new pavement, and replacing Cajon Creek Bridge Left. Small portions of the W-S Connector will also be realigned with a new bridge. The Devore Overhead Left will need an additional lane to accommodate the W-S Connector merge. It would be impractical to spend $97 million to improve this area by replacing bridges and impact other areas where there is no accident issues.

Location 4 – C2 Line, North I-215 to south I-15 Connector (5, 6, 14 & 15)
This particular roadway is the lowest of the three levels of this interchange. Reconstruction of this connector to facilitate a larger radius would result in a complete reconstruction of all the bridges and roadways in this interchange. The actual accident (F+I) rate of 0.29 for this connector (PM 17.489) is slightly higher than the statewide average of 0.26. However, the total actual accident rate is much lower (0.49 versus 0.80) for similar sections of highway. Keeping this particular connector in its current location would result in substantial reduction of right of way and environmental impacts. In order to make Line C2 (Location 4) standard it requires realignment under existing roads, new pavement and new multiple structures. The structures requiring

replacement include Cajon Creek Left Bridge, Center Connector Bridge, West Connector Bridge, and widening on Devore Overhead Left.

Locations 5 and 6 – Line A2, Northbound I-15 roadway (9)
This is a continuation of the existing alignment identified as location 3. This is the existing concrete pavement for the northbound I-15 mainline and we are proposing to keep the existing automobile traffic on this roadway and move truck traffic to a bypass. The first curve has a 2000 foot radius which equivalent to 69 mph and the second curve has a 3000 foot radius which equivalent to 75 mph where the posted maximum speed limit is 70 mph and the standard design speed is 80 mph for a standard radius of 3900 feet. The actual accident rates in this area (PM 14.273) are lower than the statewide average for similar sections of highway. For Locations 5 & 6, to make the curves standard would shift the T1, T3, A2 lines and Nedlee Street northerly. Also, there would be a northerly shift of the merge point of the A2 & B2 Lines to make the 3900 foot curve acceptable. This would shorten the merge distance to the Kenwood undercrossing which can only accommodate 5 lanes. To accommodate the new realignments, additional right of way acquisition increase of the retaining wall size, and a new roadway section would be required for the A2 line through the revised radius and it's superelevation transitions.

Location 7 – B1 line, I-215 freeway mainline (11 & 12)
This is an existing roadway where the centerline radius is less than 3900 feet. The radius of 3000 feet has existed since the freeway was constructed in the late 1950's. The existing design and comfort speed is 75 mph this condition is 5 mph over the posted speed and 5 mph less than the proposed design speed of 80 mph. We propose to widen the freeway about the existing centerline to minimize impacts to motorists, adjacent properties and environmental areas. Symmetrical widening about the existing roadway will also facilitate easier construction staging. The accident rate along this section of I-215 in the northbound direction is below the average; however, the southbound accident rate is slightly above. The actual total southbound accident rate is 0.99 when compared against 0.90 for the statewide average. We do not believe that the radius of this curve contributes to the accident rate of this facility. The southbound direction could drive its accident rate from the lack of route continuity as well as the downhill speed of vehicles traveling from Cajon Pass. This alternative will provide route continuity for the SB I-15 traffic which should lower the accidents associated with the current 3 lane changes needed to stay on I-15. To make Line B1 (Location 7) standard, the affects would be considerable for an increase of 5 mph. The Centerline radius could be revised two ways. First, if the incoming and outgoing tangents remain at their current position, the 3900 foot radius would shift the roadway to the southwest. The centroid of the curve would move about 15 feet southwest. Both northbound and southbound mainline would have to be reconstructed. This would impact the adjacent proposed connector and ramp horizontally by extending them further south, thus requiring additional right of way acquisition as well as lengthening the span of the proposed Devore Overcrossing. This could increase the depth of structure and therefore causing the Devore OC vertical alignment to be non-standard. The connector and ramps vertical alignment would also be affected. The C1 connector would need to be lowered in order to be in the same superelevation plane of the widened freeway, thus making it's vertical alignment non-standard. Second, the 3900 foot radius could be shifted where the centerline crosses the existing centerline at the center bent of the proposed bridge. This would lessen the effects of the widening to the southwest. However, there will be some widening to the southwest and some to the northeast, northerly of the bridge, therefore, resulting in more right of way acquisition/ takes. Also, new roadway sections would be required due to the change in supertransitions and alignment shifts.

Added Cost to Make Standard:
Location 1 – The cost to make standard is estimated at $1.7 million which includes a bridge modification. These additional costs represent 0.7 % of the total project construction cost.

Location 2 – The cost to make standard is estimated at $47 million which includes the cost for new pavement along southbound I-15 and the replacement of the existing Cajon Creek overhead right bridge. These additional costs represent 19.4 % of the total project construction cost.

Location 3 – The cost to make standard is estimated at $97 million which includes the cost for new pavement along I-15 northbound, replacing Cajon Creek Right Bridge and Route 215/15 Separation Bridge. This will also include additional costs to realign I-15 southbound, replace the Cajon Creek Left Bridge, W-S Connector and the Devore Overhead Left Bridge. These additional costs represent 40.1 % of the total project construction cost.

Location 4 – The cost to make standard is estimated at $29.4 million which includes the cost of realignment under existing roads, new pavement, new Cajon Creek Left Bridge, Center Connector Bridge, West Connector Bridge, and widening on Devore Overhead Left Bridge. These additional costs represent 12.2 % of the total project construction cost.

Location 5 and 6 – The cost to make standard is estimated at $1.7 million which includes the cost of right of way acquisition for both location 5 and 6. These additional costs represent 0.7 % of the total project construction cost.

Location 7 – The cost to make standard is estimated at $1.2 million which includes the cost of realignment and the addition of 1 lane in both the northbound and southbound directions of I-215 at this location. These additional costs represent 0.5 % of the total project construction cost.

2.3. Design Exception Feature #3 – Stopping Sight Distance (Horizontal Curve and Obstructions)

Nonstandard Features (refer to Attachments 3, 4, 5, 6, 12, 13 & 14):

Location	Attachment #	Line	Location Station	Provided		Required	
				Speed (mph)	SSD (ft)	Speed (mph	SSD (ft)
1	5	C2	865+30	40	301	50	430
2	13	C1	925+00	42	327	50	430
3	3	CD	933+71 to 936+78	40.2	302	50	430
4	4	A3	851+77 to 856+91	55	501	80	930
5	6	A3	858+07 to 863+15	55	501	80	930
6	5	A2	860+29 to 865+34	55.4	506	80	930
7	5, 14	B3	928+52 to 935+74	68.8	723	80	930
8	12	B1	904+29 to 915+20	77	883	80	930
9	4	C2	848+82 to 852+17	43	331	50	430

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 203.1 - General
"Horizontal alignment shall provide at least the minimum stopping sight distance for the chosen design speed at all points on the highway, as given in Table 201.1 and explained in Index 201.3."

Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 309.1(1)
" Horizontal clearances greater than those cited below under subsection (3) – 'Minimum Clearances' shall be provided where necessary to meet horizontal stopping sight distance requirements."

Reasons for Requesting Exception:
This particular feature deals with restrictions to stopping sight distance that would result in a design speed that would be less than presented for that particular facility. There are two different roadways involved in this feature: The C2 line which is also an existing freeway to freeway connector with a 50 mph design speed and the C1 line which is a freeway to freeway connector with a 50 mph design speed.

Location 1 – C2 Line, North I-215 to south I-15 connector (5)
The existing C2 connector is the lowest level of this three level interchange. The roadway is in a depressed section with cut slopes on both the left and right sides. The sight obstructions come from a partial obstruction due to a bridge column. The bridge column effectively reduces the stopping sight distance at a spot location at Station 865+30. The connector stopping sight distance of 301 feet provides a speed of 40 mph, which is very similar to the connector's design speed of 43 mph due to it's 650 foot radius. The actual accident (F+I) rate of 0.29 for this connector (PM 17.489) is slightly higher than the statewide average of 0.26. However, the total actual accident rate is much lower (0.49 versus 0.80) for similar sections of highway. A cut slope on the left side of the connector had restricted SSD to 43 mph. However, a retaining wall is proposed to be placed at 24 feet from the edge of the shoulder which will meet the standard SSD. The single column obstruction, the stopping sight distance (SSD) will never meet the standard for 50 mph design speed. As noted in the Advisory Design Feature #3, the horizontal and vertical alignments are being retained in an effort to minimize impacts to right of way and environmental areas adjacent to the freeway. To make standard, the Separation Bridge (No. 54-783) will need to replaced.

Location 2 – Along C1 line, North I-15 to south I-215 connector (13)
The sight restriction is located at the braided ramp bridge structures safety shaped railing as it passes over the D3 line . In this particular area the stopping sight distance provides a speed of 42 mph for only 160 feet along the bridge railing. The design speed of a connector is 50 mph. As mentioned on design exception feature number 1 at, this location an attempt was made to balance the design speeds for the various braided and dependant roadways to achieve a design which was mutually acceptable . With Lines C1, D3, and CD affecting each other, making the C1 Line SSD standard would cause other alignments to become non-standard. In order to make the 430' SSD standard, the inside shoulder would need to be widened over 11 feet. However, the required minimum clearance (16.5 feet) of the C1 bridge over the D3 Line would then be non-standard. If the vertical alignments for both Lines C1 and D3 were adjusted for the bridge clearance, they would also become non-standard. If C1 was shifted to the outside, the vertical alignment would exceed 6% and become non-standard. If the non-standard 6% is accepted, then the horizontal alignment would need to extend farther south so the crest vertical curve would remain standard.

Location 3 – Along CD line, Northbound I-15 off ramp to Devore Road (3)
The sight restriction is located at the ramp bridge structure railing as it passes over the Cajon Boulevard. In this particular area the stopping sight distance is 302 feet provides a speed of 40 mph for about 170 feet of bridge railing which less than the design speed of 50 mph. In order to make the 420 foot SSD standard, the bridge railing will have to be tapered to a maximum of about 14 feet to the outside. This would only make the stopping sight distance standard not accounting for curves design speed. To make the curve standard, see design exception feature 2 above. Taillight will not be visible within this particular area due to the bridge railing.

Location 4 - A3 line, Southbound I-15 mainline (4)
The sight restriction, to this existing alignment, is located at the approach to the Cajon Creek Bridge Left (No. 781 L). In this particular area the stopping sight distance is 501 feet provides a speed of 55 mph for about 330 feet of bridge railing which less than the design speed of 80 mph. In order to make the 930 foot SSD standard, the roadway and existing bridge will have to be widened up to about 40'. To achieve standard sight distance, a considerable amount of additional bridge and roadway construction would be required. Also, this particular

roadway would present the largest impact to the Cajon Creek habitat areas. Taillight will not be visible within this particular area due to the bridge railing.

Location 5 - A3 line, Southbound I-15 mainline (6)
This is a continuation of the existing A3 line at Location 4. The sight restriction is located at the West Connector Undercrossing Bridge (No. 54-782). In this particular area the stopping sight distance is 501 feet provides a speed of 55 mph for about 130 feet of bridge railing which less than the design speed of 80 mph. In order to make the 930 foot SSD standard, the roadway and existing bridge will have to be widened up to 30 feet on the right shoulder. Taillight will be visible to traffic within this particular bridge area .

Location 6 - A2 line, Northbound I-15 mainline (5)
The sight restriction, to this existing alignment, is located at the approach to the I-15/I-215 Separation Bridge (No. 54-783). In this particular area the stopping sight distance is 506 feet provides a speed of 55.4 mph for about 260 feet of bridge railing which less than the design speed of 80 mph. In order to make the 930 foot SSD standard, the roadway and existing bridge will have to be widened up to 29 feet on the left shoulder. The existing 5 foot shoulder will be improved to 10 foot shoulder with this project. As mentioned on design exception number 2, this particular alignment is being widened in order to utilize the existing pavement and more importantly the bridge structure that spans over the B2, B3 and C2 alignments substantial savings in cost will be noted by this alignment. For this location, realigning Line A2 involves new pavement along I-15 NB and widening Route 215/15 Separation Bridge. Taillight will be visible to traffic within this particular bridge area .

Location 7 - B3 line, Southbound I-215 mainline (5 & 14)
The sight restriction, to this existing alignment, is located along the I-215 mainline just south of Route I-15/I-215 Separation Bridge. In this particular area the stopping sight distance is 723 feet provides a speed of 68.5 mph which less than the design speed of 80 mph. In order to make the 930 foot SSD standard, the roadway alignment will need to shift about 12 feet on the right shoulder. This restriction due to the median barrier is about 712 feet long south of Route I-15/I-215 Separation Bridge. The realignment would require the modification the bridge over the C2 connector as well as the separation bridge above. However, this widening would not be structurally feasible or consistent with ultimate project since a second widening would be needed for the ultimate lane configuration (1 HOV + 3 lanes). Taillight will be visible to traffic within this particular median area .

Location 8 - B1 line, Northbound I-215 mainline (11 & 12)
The restriction, to this existing alignment, is located along the I-215 mainline just south of the Devore Road overcrossing bridge. In this particular area the stopping sight distance is 883 feet, due to the concrete barrier, provides a speed of 77 mph which 3 mph less than the design speed of 80 mph, SSD of 930 feet, but 7 mph over the posted speed for a restriction of 1,091 feet long. As mentioned on design feature number 2, this is an existing roadway where the centerline radius is less than 3900 feet. The radius of 3000 feet has existed since the freeway was constructed in the late 1950's. The existing design and comfort speed is 75 mph which is 5 mph over the posted speed and 5 mph less than the proposed design speed of 80 mph. We propose to widen the freeway about the existing centerline to minimize impacts to motorists, adjacent properties and environmental areas. Symmetrical widening about the existing roadway will also facilitate easier construction staging. The accident rate along this section of I-215 in the northbound direction is below the average, however, the southbound accident rate is slightly above. A 3900 foot radius could be shifted where the centerline crosses the existing centerline at the center bent of the proposed bridge. This would lessen the effects of the widening to the southwest. However, there will be some widening to the southwest and some to the northeast, northerly of the bridge, therefore, resulting in more right of way acquisition/ takes. Also, new roadway sections would be required due to the change in supertransitions and alignment shifts. Taillight will be visible to traffic within this particular median area.

Location 9 - C2 line, North I-215 to south I-15 connector (4)
The sight restriction, to this existing alignment, is located just north of the merge with the I-15 southbound on the existing bridge over the Cajon Creek. In this particular area the connector stopping sight distance is 331 feet that provides a speed of 43 mph which less than the design speed of 50 mph. In order to make the 420 foot SSD standard, the existing bridge will need to be widened up to 17 feet. Also, this particular roadway would have an impact to the Cajon Creek habitat area.

Added Cost to Make Standard:
For Location 1, the cost to make standard includes the cost of replacing Separation Bridge (No. 54-783) and roadway for A2 Line at an estimated cost of $7,000,000. These additional costs represent 2.9 % of the total project construction cost.

For Location 2, to increase the stopping sight distance from 327 feet to 430 feet, and a grade of greater than 6% is accepted, the horizontal alignment would need to extend farther south and therefore additional roadway and a wider bridge structure would result in a $1,700,000 cost. These additional costs represent 0.7 % of the total project construction cost.

For Location 3, to increase the stopping sight distance from 302 feet to 430 feet, the added cost of the bridge widening is estimated at $1,300,000 which represent 0.5 % of the total project construction cost.

For Location 4, to increase the stopping sight distance from 501 feet to 930 feet, the of the roadway and bridge widening cost is estimated at $3,500,000 which represent 1.4 % of the total project construction cost.

For Location 5, to increase the stopping sight distance from 501 feet to 930 feet, the of the roadway and bridge widening cost is estimated at $1,700,000 which represent 0.7 % of the total project construction cost.

For Location 6, to increase the stopping sight distance from 506 feet to 930 feet, the roadway and existing bridge will have to be widened up to 29 feet on the left shoulder. The added cost to make standard is estimated at $2,500,000 which represent 1.0 % of the total project construction cost.

For Location 7, to increase the stopping sight distance from 723 feet to the standard 930 feet, the added cost of the widening and bridge modifications is estimated at $2,700,000 which represent 1.1 % of the total project construction cost.

For Location 8, to increase the stopping sight distance from 883 feet to 930 feet, the I-215 freeway mainline will need to be realigned and additional 1 lane in both the northbound and southbound directions of I-215 at this location will also be needed. The added cost to make standard is estimated at $1,200,000 which represent 0.5 % of the total project construction cost.

For Location 9, to increase the stopping sight distance from 331 feet to 430 feet, the existing bridge will need to be widened up to 17 feet. The added cost to make the SSD standard is estimated at $1,900,000 which represent 0.8 % of the total project construction cost.

2.4. Design Exception Feature #4 – Minimum Horizontal Clearance to Objects and Shoulder Width

Nonstandard Features (refer to Attachment 5):

On Lines B2 and B3, from about 937+00 to 937+40, the horizontal clearance will be about 7 feet to the proposed Type 60E PCC barrier. The required horizontal clearance is 10 feet to all objects from the edge of travel way.

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 309.1(3)(a) - Horizontal Minimum Clearance
"The minimum horizontal clearance to all objects, such as bridge rails and safety-shaped concrete barriers, as well as sand-filled barrels, metal beam guardrail, etc., on all freeway and expressway facilities, including auxiliary lanes, ramps, and collector roads, shall be equal to the standard shoulder width of the highway facility as stated in Table 302.1. A minimum clearance of 4 feet shall be provided where the standard shoulder width is less than 4 feet."

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 302.1 - Shoulder Width
"The shoulder widths given in Table 302.1 shall be the minimum continuous usable width of paved shoulder.
Reasons for Requesting Exception:
The construction of the interchange originally built the existing B2 and B3 alignments as the mainline freeway traveling toward San Bernardino. The bridge at this location spans over the C2 connector and was designed to accommodate three northbound lanes and three southbound lanes with standard 10 foot shoulders on the outside and a 22 foot median in separating the two roadways. This would provide for 10 feet shoulders and two feet for median barrier. The intent of this particular alternative was to utilize the existing bridge for the northbound and southbound connectors. The exception is created by another existing bridge above the B2 and B3 alignment which is the A2 Line or northbound I-15 freeway. This creates a situation where the column of the A2 bridge passes through the deck of the B2 and B3 bridges. The A2 bridge has 5 foot wide columns extending down between the B2 and B3 alignments, thus creating shoulder widths of about 7 feet on the inside of each roadway at the column. It is not uncommon to have columns in the median providing a brief or temporary reduction in the median width. The B2/B3 alignments are designed for future widening to the outside to accommodate a fourth lane in each direction. This widening will be reserved for a future HOV direct connector to the I-15 HOV or Managed lanes. At that time it may be possible to construct the added 2 feet to make the left shoulder 10 feet wide. Therefore, it is impractical to widen the B2 and B3 alignment to obtain a standard median because that would require the B2 and B3 Bridges to be widened by two feet to the outside.

Added Cost to Make Standard:
For Line B2, the cost to make standard is estimated at $2.1 million which includes the costs to increase median width, realignment through the existing Center Connector Bridge with outside widening on the bridge and along the pavement.

For Line B3, the cost to make standard is estimated at $2.2 million which includes the costs of increasing the median width that requires realignment through the existing Center Connector Bridge with outside widening on the bridge along the pavement, and a retaining wall. Widening a bridge by 2 feet is highly expensive and may require a minimum width of 10 feet to be structurally sound.

These additional costs represent 1.8 % of the total project construction cost.

2.5. Design Exception Feature #5 – Interchange Design Standards

Nonstandard Features (refer to Attachments 9 & 10):

Along the existing "B2" Line, 962+00 to 968+00, freeway entrance connects with through traffic on the left (See attachments 18 & 20). The requirements are that connections shall be to the right of through traffic

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 504.2(1) - Freeway Entrances and Exits
"All freeway entrances and exits, except for direct connections with median High-Occupancy Vehicle (HOV) lanes, shall connect to the right of through traffic."

Reasons for Requesting Exception:
All on and off ramps should join the mainline from the right hand side. The northbound I-215, which was the original mainline, joins the I-15 mainline on the left hand side. This particular design is a propagation of the existing roadway configuration. The I-215 transition to the number 1, 2 and 3 lanes and the I-15 merges on the right hand side forming lanes 4, 5 and 6. Over the next half mile, one lane is reduced keeping a five lane configuration to the north. It is proposed to keep this configuration to save on cost, and impacts to adjacent lands. The primary reason that this existing configuration, 2 lanes on I-215 merging with 3 lanes from I-15, does not currently work, is that there are slow moving trucks along with the automobiles in the I-215 connector which must weave across I-15 traffic to reach the slow lane. This section of the I-15 is on a 4% uphill grade causing trucks to slow considerably. With our proposed design, a northbound truck by-pass will remove all trucks and slow vehicles from the northbound I-215 connector and merge on the right hand side further north, creating a standard merge configuration for the slower vehicles. Keeping this configuration will allow us to maintain the B2 and the A2 alignments saving substantial cost and impacts to the surrounding community.

The northbound I-215 B2 alignment and the northbound A2 alignment have a total accident rate below the total average. The current accident rate northerly of where these two roadways join is above the average for a similar facility. The northbound accident rate between the merge and Kenwood Avenue is 0.79 compared to an average of 0.65. A substantial number of these accidents involve slow moving trucks whose accident rate is double the average for a freeway. It is believed that by providing the northbound truck bypass in this area, the accident rate will be reduced closer to the average.

Added Cost to Make Standard:
To make Line B2 standard requires a merge swap with Line A2 and will effect all other structures, ramps, and connectors near the interchange, as a result an interchange reconfiguration is needed along the I-15 northbound section. A graphic representation of this alignment is proposed in alternative 3. The NB I-15 is realigned in the 'median' of the NB freeway, and a longer NB I-15 truck bypass is needed with a new bridge over the B2/B3 alignments. The B2/B3 alignment is moved further to the east requiring a new bridge over the C-2 connector. The NB I-15 mainline over Cajon Creek would be revised requiring that structure to be replaced. The cost to make standard is $35 million. These additional costs represent 14.5 % of the total project construction cost.

2.6. Design Exception Feature #6 – Interchange Spacing

Nonstandard Features (refer to Attachment 16):

#	Location	Existing Spacing (Miles)	Standard Spacing (Miles)
1	Between I-15/I-215 Interchange and Glen Helen Pkwy Interchange	1.6	2.0
2	Between I-15/I-215 Interchange and Glen Helen/Devore Rd Interchange	0.5	2.0
3	Between I-15/I-215 Interchange and Kenwood Ave Interchange	1.2	2.0

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 501.3 – Spacing
"The minimum interchange spacing shall be one mile in urban areas, two miles in rural areas, and two miles between freeway-to-freeway interchanges and local street interchanges"

Design Information Bulletin Number 77 – Interchange Spacing requirements provides added guidance on how the interchange spacing is implemented with specific 'weaving' distances between on and off ramps.

"The minimum spacing between interchanges shall be 1.0 mile in urban areas, 2.0 miles in rural areas, and 2.0 miles between freeway-to-freeway interchanges and local street interchanges". It should be noted that DIB 77 is still showing Metric units of measure which we have converted into English distances for the weaving standards. The 1 and 2 mile spacing distances will be used per the 6th edition of the HDM.

PHYSICAL FEATURE	REQUIRED SPACING	
	1.0 mile *	2.0 miles *
Minimum weaving length as defined in DIB 77	1,969 feet *	4,921 feet *
Minimum distance between centerline of adjacent intersecting roadways	1.0 mile *	2.0 miles *
* See DIB 77 for Metric Unites		

Reasons for Requesting Exception:
At location 1, the maximum distance available is 1.6 miles spacing between the I-15/I-215 Interchange and Glen Helen Pkwy Interchange. The Glen Helen Interchange will be maintained at its location primarily to serve mainly the Glen Helen Regional Park and Pavilion facility and Rosena Ranch. Relocating this interchange to provide a standard two mile spacing will have significant impact on the existing San Bernardino National Forest area, adjacent development, riparian areas and require additional right of way. This interchange, which was constructed about 15 years ago, is located where a local arterial street crossed under the freeway. The I-15 northbound Connector to I-215 southbound will operate at LOS B or better with the proposed configuration. The I-15 mainline segment will operate at LOS D and C or better in the northbound and southbound direction respectively. The provided weaving lengths between the ramp influence areas of these two interchanges are approximately 4,770 feet and 4,915 feet along the northbound and southbound respectively. Therefore, these weaving lengths are only 151 feet and 6 feet short of the standard 4921 feet, respectively.

At location 2, the Devore Road Interchange is proposed to have an approximate spacing of 0.7 miles to the I-15/I-215 Interchange. The proposed Interchange will need to serve the Devore community north of I-15/I-215 area and businesses and community located at the southeast quadrant of the Devore Interchange. If the two mile spacing were implemented, the relocated interchange will be positioned in an area dominated by a flood plane and prime SBKR habitat. This segment of the I-215 mainline will operate at LOS D or better in the northbound and southbound directions.

The I-215 southbound off- ramp to Devore Road will operate at LOS C or better and the I-215 northbound on ramp from Devore Road will operate at LOS B or better with project conditions.

At location 3, the maximum distance available is a 1.2 mile spacing between the I-15/I-215 Interchange and Kenwood Ave Interchange. The Kenwood Avenue Interchange will be kept at its location to serve mainly the Devore community located northeast of I-15. This interchange currently serves as one of only two access points

to Cajon Blvd to the west. At the 2 mile location, the freeway resides on the mountainside making an interchange impractical. This segment of the I-15 mainline will operate at LOS D or better in the northbound and southbound directions with the proposed configuration. Also, there will be no weaving area along this segment of the freeway. The provided weaving distance along the truck bypass/collector distributor, between the northbound I-215 truck bypass and off ramp to Kenwood Avenue, is approximately 1,845 feet which operate at LOS C or better with the proposed configuration.

Added Cost to Make Standard:
At location 1, the added cost to make it standard is estimated at $35 million for additional roadway and bridge construction, embankments, right of way and additional environmental mitigation costs. These additional costs represent 14.5 % of the total project construction cost.

At location 2, the added cost to make it standard is estimated $35 million for additional roadway and bridges construction, embankments, right of way and added environmental mitigation costs. These additional costs represent 14.5 % of the total project construction cost.

At locations 3, the added cost to make it standard is estimated at $35 million for additional roadway and bridge construction, embankments, right of way and additional environmental mitigation costs. These additional costs represent 14.5 % of the total project construction cost.

3. TRAFFIC DATA

A Traffic Operation Analysis was performed to study the existing traffic conditions (Year 2007), forecast future traffic demand (Year 2040) and assess the impact on traffic conditions of the proposed improvements. Detailed methodologies and analysis results can be referenced in the draft Traffic Operations Analysis report dated December 18, 2009.

The current and projected Average Daily Traffic volumes for this project are shown in Table 1:

Table 1: Freeway Mainline Peak Hour Demand Comparison

Freeway Segment	ADT		
	2007	2017	2040
I-15 Northbound			
Sierra Ave On Ramp to Glen Helen Pkwy Off Ramp	55,500	81,200	140,400
Glen Helen Pkwy On Ramp to I-215 SB Connector	53,600	78,200	134,600
I-215 SB Connector	8,800	10,000	12,600
I-215 SB Connector to I-215 NB Connector	44,800	68,200	122,000
I-215 NB Connector to Kenwood Ave Off Ramp	66,100	103,000	188,000
Kenwood Ave On Ramp to North of Kenwood Ave	64,900	103,000	190,700
I-15 Southbound			
North of Kenwood Ave to Kenwood Ave On Ramp	70,400	106,000	187,900
Kenwood Ave On Ramp to I-215 SB Connector	71,600	107,800	191,100

I-215 SB Connector to I-215 NB Connector	50,400	73,200	125,600
I-215 NB Connector to Glen Helen Pkwy Off Ramp	59,200	82,600	136,400
Glen Helen Pkwy On Ramp to Sierra Ave Off Ramp	58,100	83,800	143,000
I-215 Northbound			
University Pkwy On Ramp to Palm Avenue	29,600	44,000	77,000
Palm Ave On Ramp to Devore Rd Off Ramp	28,400	43,400	78,000
I-15 SB Connector	8,800	9,400	10,800
I-15 NB Connector	21,300	34,800	65,900
I-215 Southbound			
Connector from I-15 SB	21,300	34,700	65,400
CD On Ramp to Palm Ave Off Ramp	31,400	46,200	80,400
Palm Ave On Ramp to University Pkwy Off Ramp	30,100	45,000	79,100

Table 2 shows the projected (Year 2040) AM and PM peak hour traffic volumes and percent of trucks for the I-15 freeway mainline between the adjacent interchanges and the ramps.

Table 2: Year 2040 I-15 Mainline and Ramp Peak Hours Volumes

Freeway Segment	2040			
	AM		PM	
	Volume vph	Trucks %	Volume vph	Trucks %
I-15 Northbound				
Sierra Ave On Ramp to Glen Helen Pkwy Off Ramp	5,898	12%	8,862	13%
Glen Helen Pkwy Off Ramp	194	7%	473	5%
Glen Helen Pkwy Off Ramp to Glen Helen Pkwy On Ramp	5,704	12%	8,392	14%
Glen Helen Pkwy On Ramp	104	1%	488	6%
Glen Helen Pkwy On Ramp to I-215 NB Connector	5,808	12%	8,880	13%
I-215 SB Connector	820	3%	793	7%
I-215 SB Connector to I-215 NB Connector	4,988	14%	8,086	14%
I-215 NB Connector	2,943	10%	5,490	5%
I-215 NB Connector to Kenwood Ave Off Ramp	7,931	12%	13,576	10%
Kenwood Ave Off Ramp	79	23%	309	7%
Kenwood Ave Off Ramp to Kenwood Ave On Ramp	7,851	12%	13,267	10%
Kenwood Ave On Ramp	20	30%	794	6%
Kenwood Ave On Ramp to North of Kenwood Ave	7,871	12%	14,061	10%
I-15 Southbound				

North of Kenwood Ave to Kenwood Ave On Ramp	14,452	9%	11,119	11%
Kenwood Ave Off Ramp	584	14%	11	27%
Kenwood Ave Off Ramp to Kenwood Ave On Ramp	13,869	8%	11,108	11%
Kenwood Ave On Ramp	210	6%	90	10%
Kenwood Ave On Ramp to I-215 SB Connector	14,079	8%	11,198	11%
I-215 SB Connector to I-215 NB Connector	8,385	12%	7,099	14%
I-215 NB Connector	657	9%	695	4%
I-215 NB Connector to Glen Helen Pkwy Off Ramp	9,042	11%	7,794	13%
Glen Helen Pkwy Off Ramp	152	14%	64	6%
Glen Helen Pkwy Off Ramp to Glen Helen Pkwy On Ramp	8,890	11%	7,730	13%
Glen Helen Pkwy On Ramp	535	7%	190	13%
Glen Helen Pkwy On Ramp to Sierra Ave Off Ramp	9,424	11%	7,920	13%

Table 3 shows the projected (Year 2040) AM and PM peak hour traffic volumes and percent of trucks for the I-215 freeway mainline between the adjacent interchanges and the ramps.

Table 3: Year 2040 I-215 Mainline and Ramp Peak Hours Volumes

Freeway Segment	2040			
	AM		PM	
	Volume vph	Trucks %	Volume vph	Trucks %
I-215 Northbound				
University Pkwy On Ramp to Palm Ave Off Ramp	3,711	9%	6,713	5%
Palm Ave Off Ramp	871	3%	1,143	1%
Palm Ave Off Ramp to Palm Ave On Ramp	2,840	11%	5,571	6%
Palm Ave On Ramp	453	3%	613	2%
Palm Ave On Ramp to Devore Rd Off Ramp	3,293	10%	6,184	5%
Palm Ave Off Ramp	150	5%	235	13%
Palm Ave Off Ramp to Devore Rd On Ramp	3,143	10%	5,949	5%
Palm Ave On Ramp	457	10%	236	3%
Palm Ave On Ramp to I-15 SB Connector	3,600	10%	6,185	5%
I-15 SB Connector	657	9%	695	4%
I-15 NB Connector	2,943	10%	5,490	5%
I-215 Southbound				
I-215 Connector from I-15 SB	5,694	4%	4,101	6%
CD Off Ramp	158	5%	85	6%

CD Off Ramp to CD On Ramp	5,536	3%	4,016	6%
CD On Ramp	935	5%	447	3%
CD On Ramp to Palm Ave Off Ramp	6,471	4%	4,462	6%
Palm Ave Off Ramp	784	2%	275	6%
Palm Ave Off Ramp to Palm Ave On Ramp	5,688	4%	4,187	6%
Palm Ave On Ramp	1,061	2%	963	2%
Palm Ave On Ramp to University Pkwy Off Ramp	6,749	4%	5,151	5%

4. ACCIDENT ANALYSIS

Traffic Accident Surveillance and Analysis System (TASAS) data was provided by Caltrans District 8, which includes accidents that occurred between October 01, 2005 and September 30, 2008 on the I-15 and I-215 freeway from PM12.5 to R19.5 and PM 14.00 to 17.75 respectively including the interchange ramp areas for a period of three years. Table 4 shows the accident rate at the adjacent interchanges and the mainline segment within the study area.

Table 4: TASAS – Accident Rate from 10/01/2005 to 09/30/2008

Location	Feature #	Alignment Line #	Actual *(Per MVM for mainline, per MV for ramp)*			Average *(Per MVM for mainline, per MV for ramp)*		
			Fatal	F + I	Total	Fatal	F + I	Total
Route 15 Mainline:								
Mainline, NB from PM 12.500 to 16.373	3-4, 3-5 6-1	A1, A2	0.003	**0.43**	**1.31**	0.010	0.27	0.79
Mainline, SB from PM 12.500 to 16.373	1-1,3-6, 6-1	A1, A3	0.003	0.19	0.72	0.010	0.27	0.79
Mainline, NB from PM R14.273 to R16.40	6-3	A2	**0.011**	**0.30**	**0.79**	0.008	0.23	0.65
Mainline, SB from PM R14.048 to R16.40	6-3	A3	**0.015**	**0.54**	**1.50**	0.008	0.23	0.65
Mainline, NB from PM R13.799 to R14.275 *	5	B2	**0.024**	0.27	0.51	0.011	0.29	0.84
Mainline, SB from PM R13.799 to R14.048 *	3-7	B3	0.000	0.28	0.69	0.014	0.35	1.00
Route 15 Ramps:								

NB Off to Glen Helen Pkwy, PM 14.565			0.000	**1.75**	**5.97**	0.007	0.37	1.20
SB On from Glen Helen Pkwy, PM 14.587			0.000	**0.96**	**0.96**	0.004	0.18	0.60
SB Off to Glen Helen Pkwy, PM 14.996			0.000	0.00	0.00	0.007	0.37	1.20
NB On from Glen Helen Pkwy, PM 15.008			0.000	0.00	**4.56**	0.004	0.18	0.60
NB Off to SB I-215, PM 16.137	2-1, 3-2	C1	0.000	0.00	0.00	0.003	0.10	0.30
SB Off to SB I-15, PM R14.048 **	2-2	A3	0.000	0.05	0.10	0.003	0.10	0.30
NB On from NB I-15, PM R14.273 **	1-1, 2-3, 2-5, 2-6	A2	0.000	0.03	0.08	0.005	0.20	0.60
SB On from Kenwood Ave, PM R14.787		K4	0.000	**0.63**	**0.63**	0.004	0.18	0.60
NB Off to Kenwood Ave, PM R14.806		K1	0.000	**0.67**	**1.34**	0.007	0.37	1.20
SB Off to Kenwood Ave, PM R15.200		K3	0.000	**7.72**	**15.44**	0.007	0.37	1.20
NB On from Kenwood Ave, PM R15.210		K2	0.000	0.00	0.00	.004	0.18	0.60
Route 215 Mainline:								
Mainline, NB from PM 14.00 to 17.753	2-7, 3-8, 4, 6-2	B1, B2	0.000	0.17	0.66	0.010	0.29	0.90
Mainline, SB from PM 14.00 to 17.753	4, 6-2	B1, B3	**0.028**	**0.50**	**0.99**	0.010	0.29	0.90
Route 215 Ramps:								
SEG SB On from Cajon Blvd, PM 17.075			0.000	**0.77**	**1.54**	0.004	0.23	0.70
NB Off to Devore Rd, PM 17.146		D1	0.000	**0.68**	**1.37**	0.004	0.42	1.20
NB On from Devore Rd, PM 17.253			**0.318**	**0.32**	**2.55**	0.008	0.16	0.55
NB Off to SB I-15, PM 17.489	2-4, 3-1, 3-9	C2	0.000	**0.29**	0.49	0.007	0.26	0.80
SEG SB Off to Cajon Blvd, PM 17.654	3-1	D3	0.000	**1.19**	**5.95**	0.004	0.23	0.70

* TASAS identifies this as part of the I-15 'mainline', however it is actually a portion of the northbound and southbound I-215 connectors.

** TASAS identifies this as a 'ramp' to the freeway but actually it is the I-15 'mainline' northbound and southbound.

Note: **BOLD #** Indicate actual is higher than the statewide average.

TASAS-TSN data indicates that the accident actual total rate, when compared to the statewide average at the adjacent interchanges, at similar facilities, is higher at (9) nine locations along Route 15 and (5) five locations along Route 215. The PROJECT is expected to reduce congestion on Interstate 15 and 215 thereby reducing the accident rates in the area.

The accident rates for various sections of the state highways are above and below the statewide average for similar facilities. This discussion will look into the higher accident rates to identify the possible causes and corrective actions this project can implement to reduce these accident rates.

The northbound I-15 from PM 12.5 to 16.3 has accident rates higher than the statewide average. This is the location where the freeway narrows from 4 to 3 lanes and there is recurring congestion typically in the evenings. This project will add 1 to 2 lanes within this area to reduce congestion. A similar reduction in the accident rate is anticipated.

The northbound I-15 from PM R14.2 to R16.4 has accident rates higher than the statewide average. This is the location where the freeway merges with lanes from I-215. Northbound trucks from I-215 must weave across the I-15 lanes to reach the slow lanes. There is also a non standard weaving distance to the Kenwood off-ramp. It is believed that many of the accidents in this area are related to these weaving / merging maneuvers. This project will construct northbound truck bypass lanes in all of the alternatives, which will eliminate the truck weaving maneuver and the congestions related to it. The northbound Kenwood off-ramp will only be accessible from the truck bypass, thus eliminating the non standard weaving section. A similar reduction in the accident rate is anticipated.

The southbound I-15 from PM R14.0 to R16.4 has an accident rate higher than the statewide average. This is in the location where 2 auxiliary lanes are added prior to I-15 diverging from the mainline on the right side. There is also a non-standard weaving area between the SB Kenwood on-ramp and the I-215 diverge on the left creating a short weaving area for the number of lanes which need to be crossed to access the I-215 connector. It is believed that the substantial number of lane changes associated with I-15 traffic staying on I-15 is causing congestion in this area and contributes to the higher accident rates. Alternatives 2, 3 & 3A resolve the issue associated with I-15 diverging on the right side. In these three alternatives, route continuity is provided with the I-215 traffic diverging on the right and I-15 auto traffic staying in the left 3 lanes. The SB Kenwood on-ramp cannot access I-215 in these configurations also eliminating the non standard weave. In alternative 5, the basic configuration of the I-15 diverging on the right is maintained and so is the Kenwood on-ramp and the short weaving section. Alternative 5 does provide a SB truck bypass to I-215 which will remove the SB trucks from the weaving area. The length of the auxiliary lanes is made standard providing a longer distance for vehicles to make the needed lane changes prior to the truck bypass and the I-215 connector. These designs are anticipated to reduce the accident rate in this area.

The northbound off and on-ramps at Glen Helen Parkway have higher accident rates than similar facilities statewide. It is believed that this has the same cause as does the I-15 mainline in this area where the #4 lane northbound is forced off at Glen Helen Parkway.

The northbound off-ramp at Kenwood Ave has a slightly higher accident rate than similar facilities statewide. It is believed that this has the same cause as does the I-15 mainline in this area where there is a congested weaving

area. The reconfiguration of the off-ramp from the truck bypass lanes is expected to reduce the accident rate for the ramp.

The southbound Kenwood off-ramp has an accident rate higher than the statewide average. This high rate (15.44 vs. 1.2) can be attributed to only a few accidents on a relatively low volume ramp. These accidents mostly involve trucks descending Cajon Pass and experiencing what appear to be related to brake failure, or the inability to stop at the ramp termini.

The SB I-215 mainline has an accident rate slightly higher than the average. Improvements in this area will add a 3rd lane and a wider left shoulder. These improvements should improve the situation.

The SB I-215 collector–distributor road (PM 17.075 and 17.654) has accident rates higher than the statewide average for a similar facility. This collector-distributor road has a very short weaving section where traffic from the NB 15 connector cross SB I-215 traffic headed to the Devore Rd off-ramp. This off-ramp also has a tight radius 'hook' configuration. The southerly end of this weaving section also has a crest vertical curve with limited sight distance. These 3 factors contribute to the high accident rate in Alternatives 2, 3 & 3A the weaving section is eliminated by use of various braiding configurations. In Alternative 5 a weaving section is provided along the Truck bypass which is about 5 times longer than the existing weaving area. In all alternatives hook ramps are moved further south, a larger radius is provided and a longer deceleration distance provided prior to the first curve. All of these proposed designs are expected to reduce the accident rate along this section of freeway.

The northbound I-215 off and on-ramps at Devore Rd have accident rates higher than the statewide average. The non-standard geometric configuration of the ramps may be contributing factors to this. The on-ramp has a compound curve ending in a very tight loop merge with high speed auxiliary lanes and weaving area immediately prior to the connector to SB I-15. All alternatives eliminate the loop on-ramp to NB I-215 as well as the short auxiliary lane. Alternatives 2 and 5 provide standard hook on-ramps further south. Alternative 3 and 3A provide direct ramp to NB I-215.

5. INCREMENTAL IMPROVEMENTS

The designs proposed already incorporate as much of incremental improvements as possible. There are no additional incremental improvements possible without providing the full standards as outlined in each feature.

6. FUTURE CONSTRUCTION

This project is compatible with the proposed I-15 ultimate facility currently under study by SANBAG and Caltrans. The Route Concept Fact Sheet dated 1999, addresses the ultimate facility as being an 8+2 freeway. The I-15 Corridor Feasibility Study has three conceptual elements for the ultimate facility. When finally approved, these features will be incorporated into the new Route Concept Report currently being updated by Caltrans. The three elements being considered are:

- Add two HOV lanes (traditional widening adjacent to #1 lane)
- Construct 'Managed' lanes (similar to the reversible lanes in San Diego on I-15)
- Construct barrier separated "Truck Only" Lanes.

The managed lane concept could be 2, 3 or 4 lanes wide with or without a movable barrier to reconfigure the number of lanes in the heavier direction of travel. Reversible use of these lanes would favor the heaviest demand direction. The HOV and Managed lanes can be accommodated in the median of the south leg of I-15. The truck lane concept takes up the most width which would require outside widening of the south leg of I-15. The north leg of I-15 presents a challenge to this project because it is unknown which alternative will be selected for the corridor. The northbound and southbound roadbeds are on independent profiles and are separated vertically by up to15 feet. Addition of more than one lane in the median will require extensive use of retaining walls for several miles.

An optional configuration on this leg would be to construct a 3rd roadbed on an independent profile further up the side of the hill, easterly of the northbound lanes. This new roadbed could be used for either the northbound mainline or the new 'managed' or 'truck' lanes. The existing northbound roadbed might be used for the managed/truck lanes if the northbound auto traffic uses the new roadbed. Close coordination with the corridor project will be needed as final design approaches.

The I-215 corridor also needs to be considered in these designs as it has not been built to its ultimate width which is 8 MF lanes + 2 HOV lanes. The August 1999 Route Concept Fact sheet identified the need for two HOV lanes on this section of I-215 just to meet the 2015 traffic demand. A revised Route Concept Report is being prepared by Caltrans at this time. The ultimate facility for I-215 will be considered in the development of this project.

7. PROJECT REVIEWS, CONCURRENCE

The exception has been reviewed during the Geometric Approval Drawing phase by the following individuals:

1. Brian Frazer, P.E., Headquarters Design Reviewer (concurred 6/30/10, [illegible])
2. Gideon Agra, P.E., Design Oversight Engineer (concurred 7/1/10, [illegible])
3. Theresa Sasis, P.E., Traffic Operations Reviewer (concurred 7/1/10, [illegible])

8. ATTACHMENTS

Attachment 1 - Location Map

Attachment 2 - Key Map

Attachment 3 - Design Exception Feature # 2 & 3 - (Sheet 11)

Attachment 4 - Design Exception Feature # 1, 2 & 3 - (Sheet 12)

Attachment 5 - Design Exception Feature # 2, 3 & 4 - (Sheet 13)

Attachment 6 - Design Exception Feature # 2 - (Sheet 14)

Attachment 7 - Design Exception Feature # 2 - (Sheet 15)

Attachment 8 - Design Exception Feature # 2 - (Sheet 16)

Attachment 9 - Design Exception Feature # 2 & 5 - (Sheet 18)

Attachment 10 - Design Exception Feature # 5 - (Sheet 20)

Attachment 11 - Design Exception Feature # 2 - (Sheet 36)

Attachment 12 - Design Exception Feature # 2 & 3 - (Sheet 38)

Attachment 13 - Design Exception Feature # 2 & 3 - (Sheet 39)

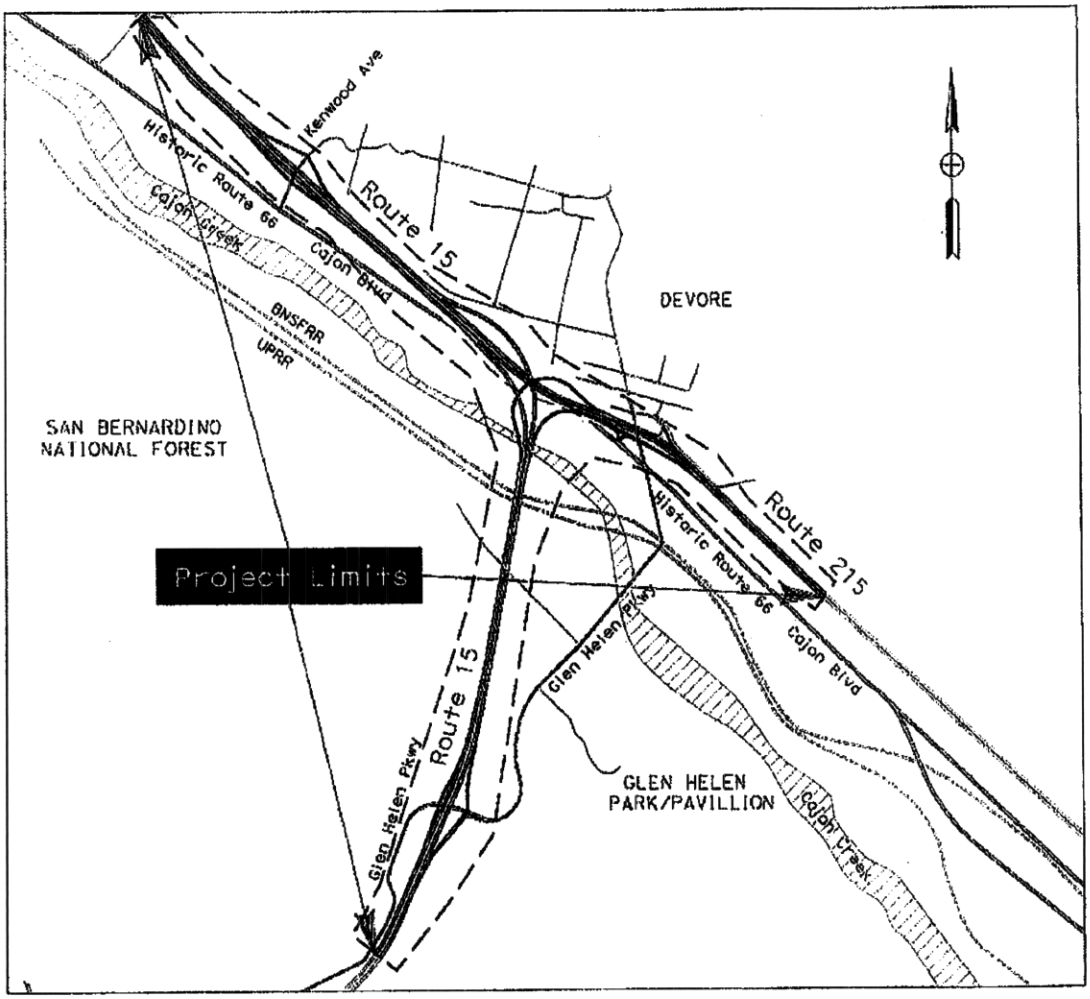
Attachment 14 - Design Exception Feature # 2 & 3 - (Sheet 40)

Attachment 15 - Design Exception Feature # 2 - (Sheet 41)

Attachment 16 - Design Exception Feature # 6 - (Sheet IC SPACING)

Attachment 17 - Design Exception Feature # 1 - (Sheet P-1)

Attachment 1
Location Map



DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0, 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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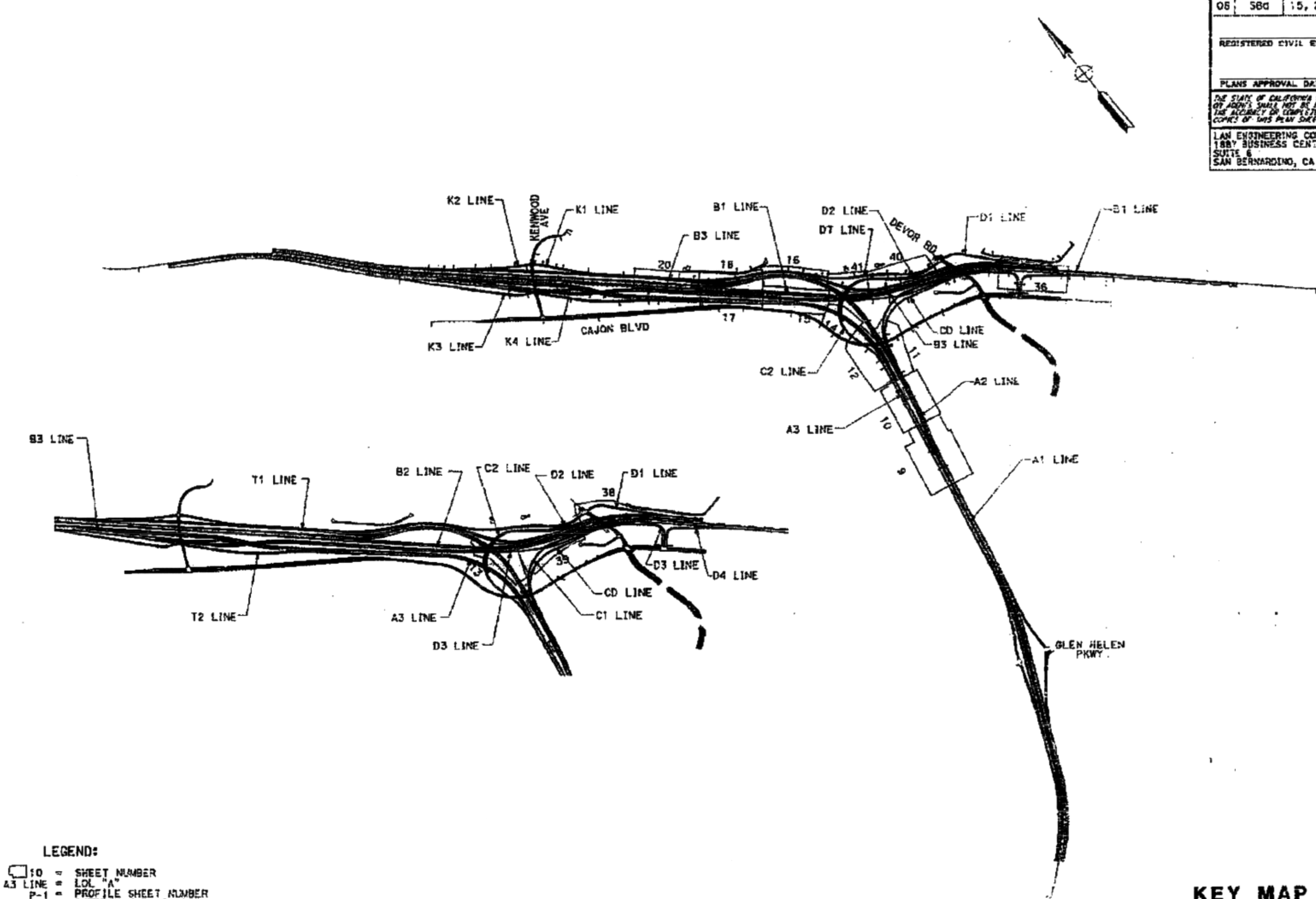
SAN BERNARDINO, CA 92410



LEGEND:

- 10 = SHEET NUMBER
- A3 LINE = LOL "A"
- P-1 = PROFILE SHEET NUMBER
- IC = INTERCHANGE SPACING SHEET

KEY MAP
MANDATORY DESIGN EXCEPTION
ATTACHMENT 2

NO SCALE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION | Caltrans

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

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => LAN Engineering
DGN FILE => Alt 3A Mandatory Key map.dgn

CU 00000 | EA 000000

LAST REVISION 00-00-00 | DATE PLOTTED => 6/24/2010 | TIME PLOTTED => 11:41:36 AM

Alt 3A Mandatory Key map.dgn 6/24/2010 11:41:36 AM

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII
DESIGN EXCEPTION FEATURE #3 - MINIMUM STOPPING SIGHT DISTANCE AT HORIZONTAL CURVE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 15.0/17.75		

REGISTERED CIVIL ENGINEER DATE

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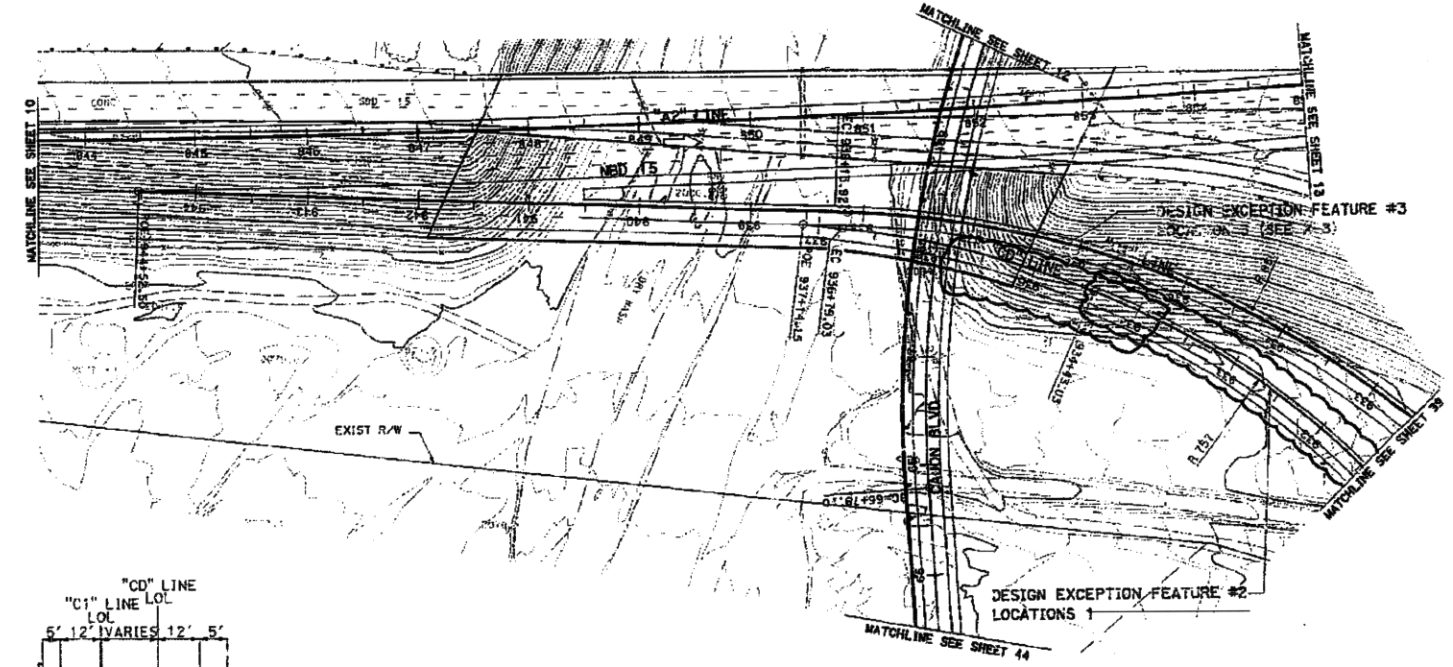
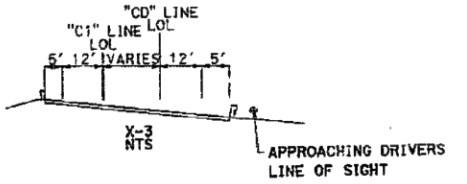
SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

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

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION | CONSULTANT FUNCTIONAL SUPERVISOR





MANDATORY DESIGN EXCEPTION ATTACHMENT 3

SCALE: 1"=100'

SHEET 11

BORDER_11 REVISED 07/1/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => LAN Engineering
DGN FILE => Alt 3A Mandatory 11.dgn

CU 00000 | EA 000000

Alt 3A Mandatory 11.dgn 6/24/2010 11:29:29 AM

PLOT SCALE = 1.000 '/ IN. | PLOT DATE => 6/24/2010 | 00-00-00 | TIME PLOTTED => 11:29:29 AM

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #1 - STOPPING SIGHT DISTANCE STANDARDS
DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII
DESIGN EXCEPTION FEATURE #3 - MINIMUM STOPPING SIGHT DISTANCE AT HORIZONTAL CURVE

DIST	COUNTY	ROUTE	POST TOTAL PROJECT	MILES PROJECT	SHEET NO.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0	16.0/17.73		

REGISTERED CIVIL ENGINEER _____ DATE _____

PLANS APPROVAL DATE _____

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SUITE 6
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

"C2" LINE
LOL
5' 12' 15'

APPROACHING DRIVERS
LINE OF SIGHT

X-4
NTS

EXIST R/W

DESIGN EXCEPTION FEATURE #3
LOCATION 9
(SEE X-4)

MATCHLINE SEE SHEET 10

MATCHLINE SEE SHEET 13

MATCHLINE SEE SHEET 14

CHINO BLVD.

"C2" LINE

DESIGN EXCEPTION FEATURE #3
LOCATION 4
(SEE X-5)

SBD 15

DESIGN EXCEPTION FEATURE #1
LOCATION 1
(SEE SHEET P-1)

DESIGN EXCEPTION FEATURE #2
LOCATION 2

"A3" LINE
LOL
10' 12' 12' 12' 12' 10'

APPROACHING DRIVERS
LINE OF SIGHT

X-5
NTS

MANDATORY DESIGN EXCEPTION ATTACHMENT 4

SCALE: 1"=100'

SHEET 12

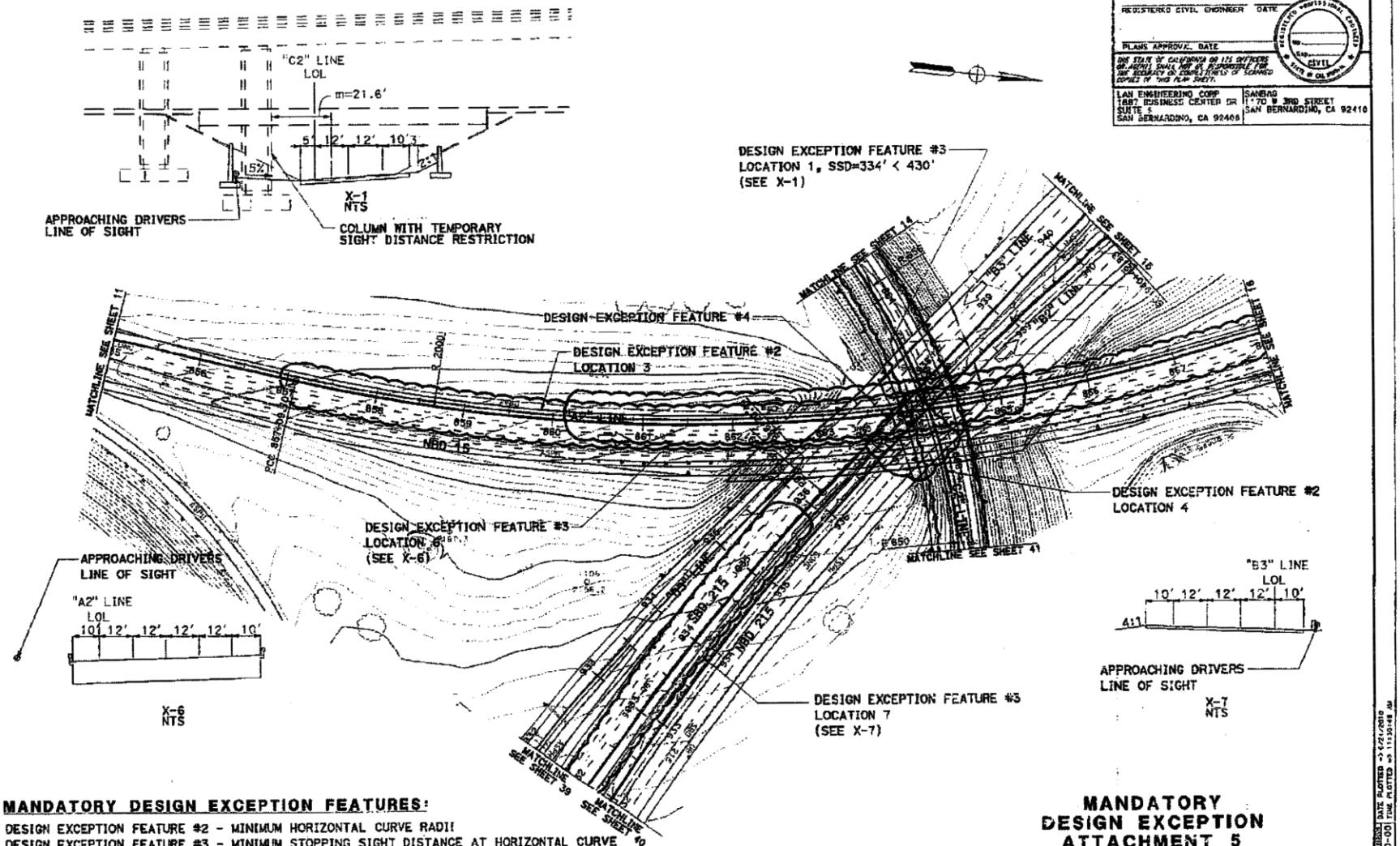
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
CONSULTANT FUNCTIONAL SUPERVISOR
CALCULATED/DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED

USER NAME = LAN Engineering
DGN FILE = A1F SA Mandatory 12.dgn

CU 00000
EA 000000

DATE PLOTTED = 5/01/2010
TIME PLOTTED = 11:30:15 AM

BORDER_11X17_REVISED_2010.dgn 5/26/2010 11:30:15 AM



Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/11.75		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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SUITE 5
SAN BERNARDINO, CA 92408

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1170 W 3RD STREET
SAN BERNARDINO, CA 92410

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CALCULATED-DESIGNED BY | CHECKED BY

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MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII
DESIGN EXCEPTION FEATURE #3 - MINIMUM STOPPING SIGHT DISTANCE AT HORIZONTAL CURVE
DESIGN EXCEPTION FEATURE #4 - MINIMUM CLEARANCES

MANDATORY DESIGN EXCEPTION ATTACHMENT 5

SCALE: 1"=100'

SHEET 13

BORDER LAST REVISED 4/1/2008

RELATIVE BORDER SCALE TO IN INCHES

USERNAME =>LAN Engineering

CU 00000

EA 000000

DATE PLOTTED =>4/21/2010
TIME PLOTTED =>11:39:48 AM

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 15.0/17.73		

REGISTERED CIVIL ENGINEER DATE

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1987 BUSINESS CENTER DR
SUITE 6
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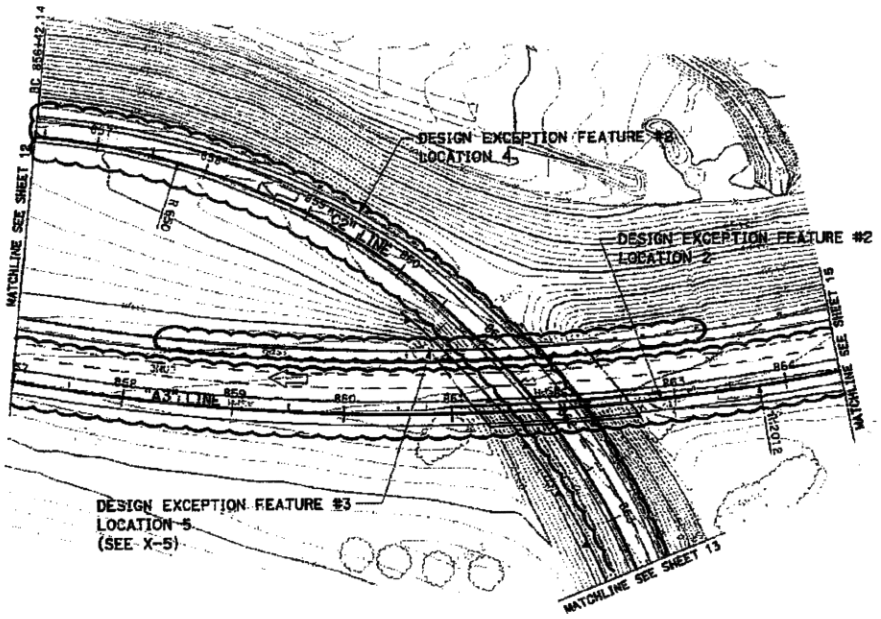
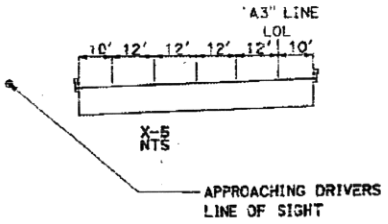
SAN BERNARDINO, CA 92410





MANDATORY DESIGN EXCEPTION ATTACHMENT 6

SCALE: 1"=100'

SHEET 14

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	REVISED BY
		CHECKED BY	DATE REVISED

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME = LAN Engineering
DGN FILE = A14 3A Mandatory 14.dgn

CU 00000 EA 000000

BORDER LAST REVISED 6/11/2009

ALT 3A Mandatory 14.dgn 6/24/2010 11:52:34 AM

DATE PLOTTED = 6/24/2010
TIME PLOTTED = 11:52:34 AM

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08	SBd	15, 215	13.5/15.0 16.0/17.4		

REGISTERED CIVIL ENGINEER DATE

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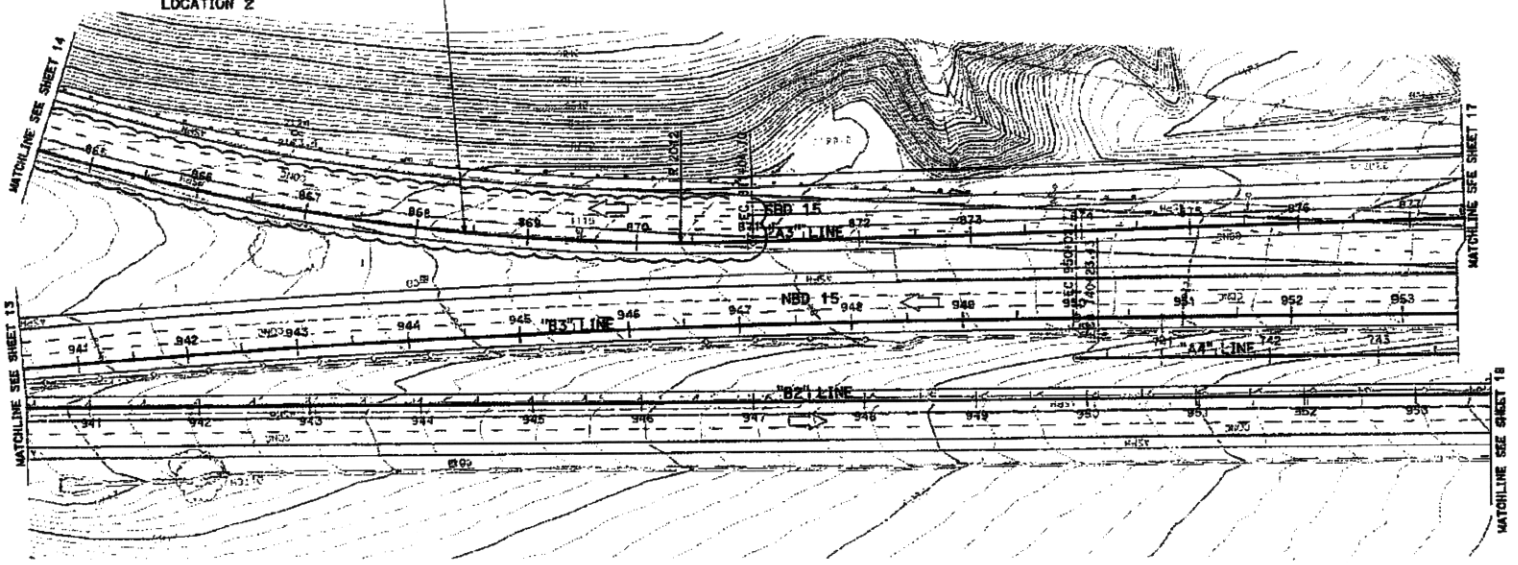
SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

DESIGN EXCEPTION FEATURE #2
LOCATION 2



MANDATORY DESIGN EXCEPTION ATTACHMENT 7

SCALE: 1"=100'

SHEET 15

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION | CONSULTANT FUNCTIONAL SUPERVISOR | CALCULATED-DESIGNED BY | CHECKED BY | REVISED BY | DATE REVISED

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => LAN Engineering

DGN FILE => A11 34 MANDATORY 15.dgn

CU 00000 | SA 00000

DATE PLOTTED => 5/21/2019
TIME PLOTTED => 11:34:59 AM

00-00-00

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	I-5, 215	5.5/15.0		
			5.0/17.3		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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SAN BERNARDINO, CA 92410

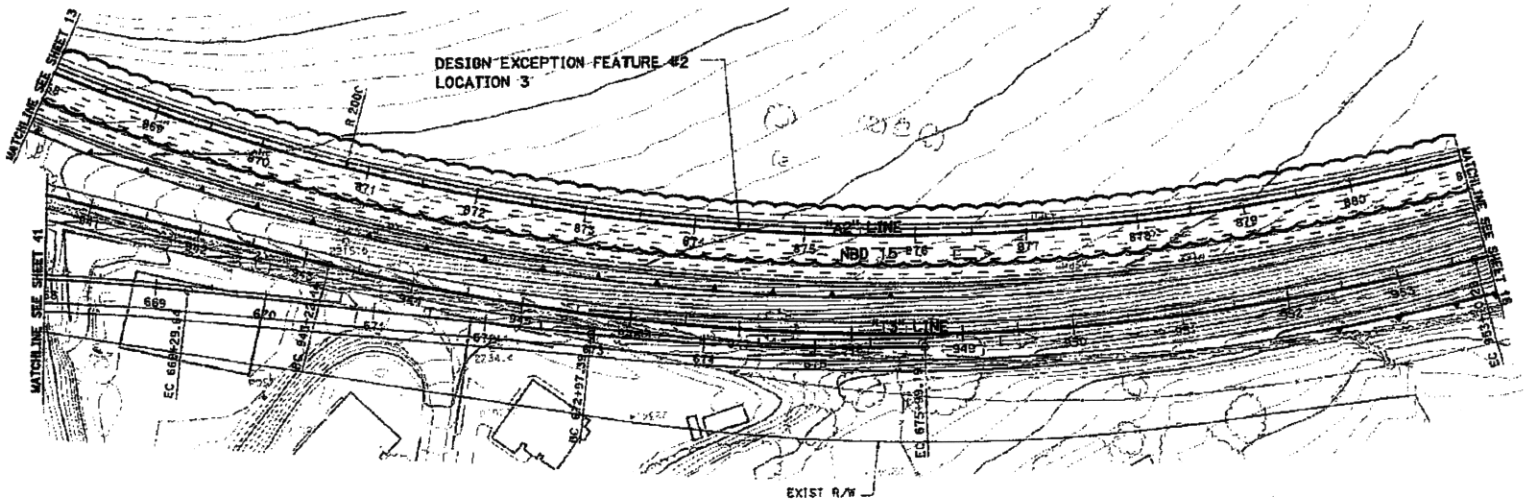
REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA — DEPARTMENT OF TRANSPORTATION

Caltrans



MANDATORY DESIGN EXCEPTION ATTACHMENT 8

SCALE: 1"=100'

SHEET 16

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TIME PLOTTED => 11:38:00 AM

PLOTTED BY: [illegible] ON 6/24/2010 11:36:00 AM

RELATIVE BORDER SCALE TO 1" INCH: 0 1 2 3

USERNAME => LAN Engineering
DGN FILE => [illegible]

CU 00000 | EA 000000

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII
DESIGN EXCEPTION FEATURE #5 - FREEWAY ENTRANCES AND EXITS SHALL CONNECT TO THE RIGHT OF THROUGH TRAFFIC

Dist	COUNTY	ROUTE	POST MILES: TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

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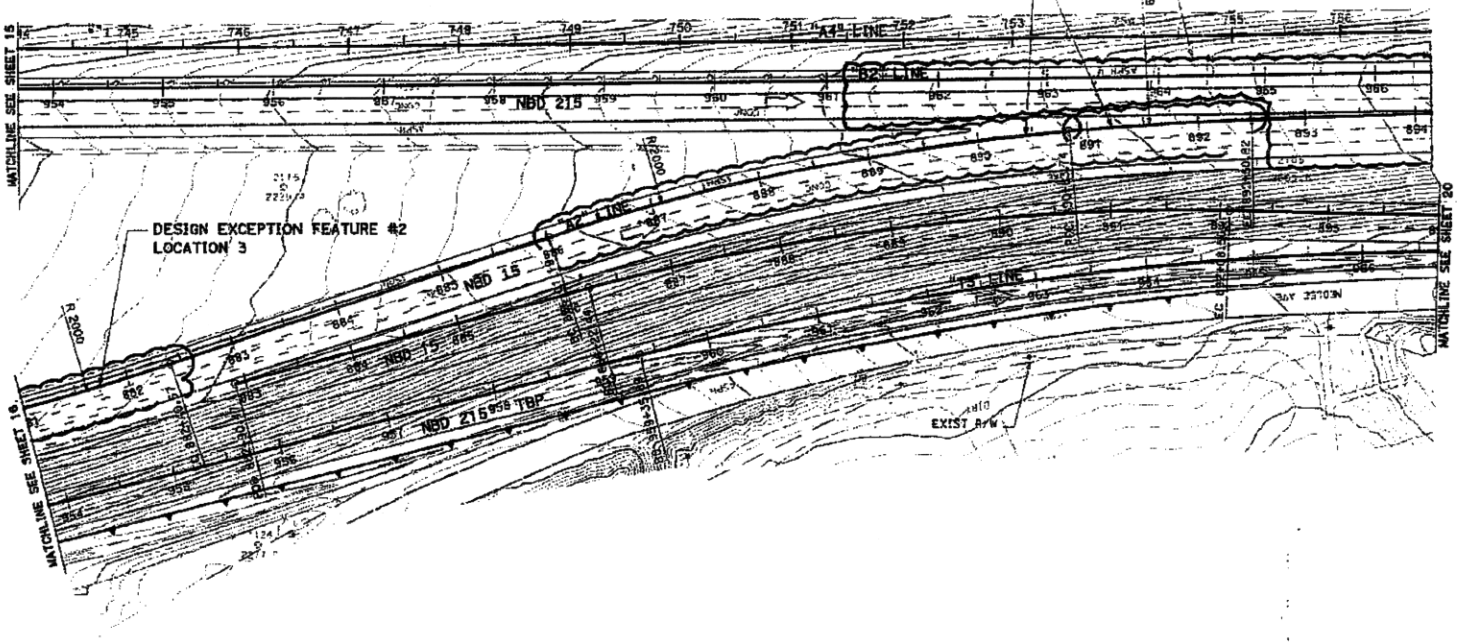
SAN BERNARDINO, CA 92410

DESIGN EXCEPTION FEATURE #5

DESIGN EXCEPTION FEATURE #2
LOCATION 5 & 6

DESIGN EXCEPTION FEATURE #2
LOCATION 3



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
CONSULTANT FUNCTIONAL SUPERVISOR
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED

MANDATORY DESIGN EXCEPTION ATTACHMENT 9

SCALE: 1"=100'

SHEET 18

DATE PLOTTED => 8/24/2010
TIME PLOTTED => 11:36:40 AM

BORDER LAST REVISED 4/11/2003
RELATIVE BORDER SCALE IS IN INCHES
USERNAME => LAN Engineering
DGN FILE => Att 9a Mandatory 18.dgn
CU 000000
EA 000000

AM 11A MSHCNAGRV 18.dgn 8/24/2010 11:36:40 AM

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #5 – FREEWAY ENTRANCES AND EXITS SHALL CONNECT TO THE RIGHT OF THROUGH TRAFFIC

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

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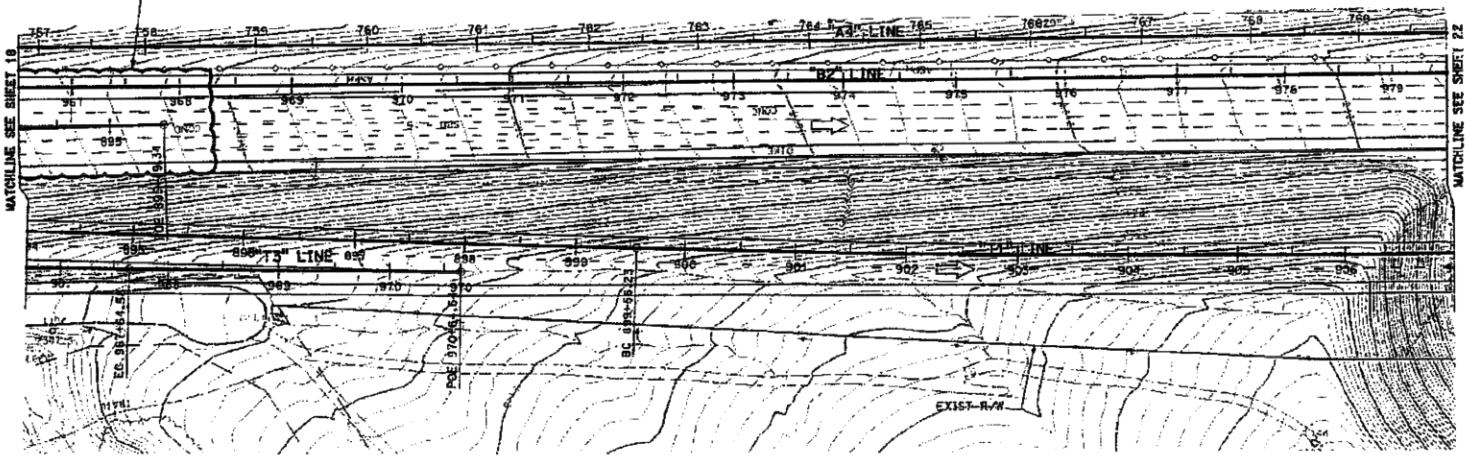
DESIGN EXCEPTION FEATURE #5



REVISED BY | DATE REVISED
CALCULATED/DESIGNED BY | CHECKED BY
CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA – DEPARTMENT OF TRANSPORTATION

MANDATORY DESIGN EXCEPTION ATTACHMENT 10

SCALE: 1"=100'

SHEET 20

DATE PLOTTED => 9/23/2010
TIME PLOTTED => 11:37:40 AM

BORDER LAST REVISED 2010 ???

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => LAN Engineering
DGN FILE => A1# 3A Mandatory 20.dgn

CU 00000 | EA 000000

A1 3A Mandatory 20.dgn 9/20/2010 11:37:40 AM

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII
DESIGN EXCEPTION FEATURE #3 - MINIMUM STOPPING SIGHT DISTANCE AT HORIZONTAL CURVE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/17.75		

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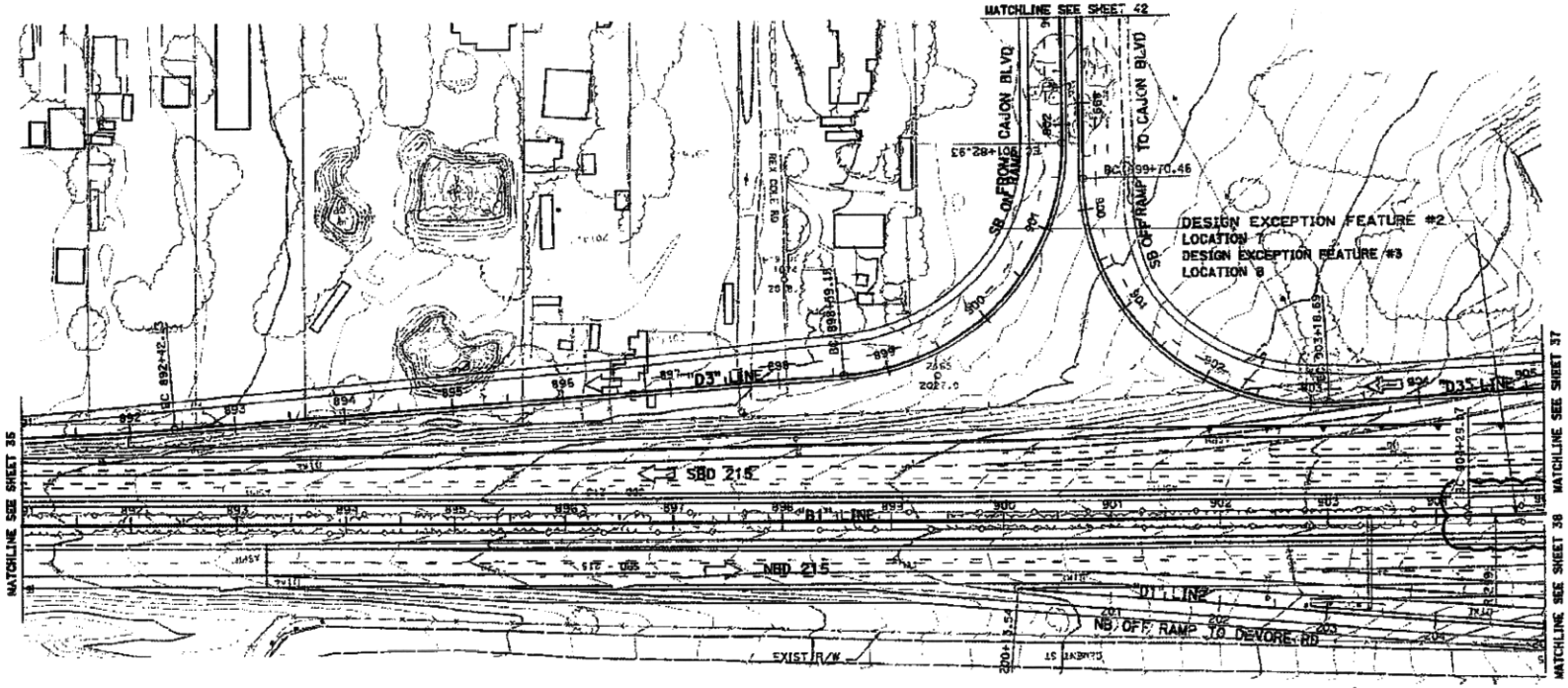
LAN ENGINEERING CORP 1887 BUSINESS CENTER DR SUITE 4 SAN BERNARDINO, CA 92408	SANBAG 1170 W 3RD STREET SAN BERNARDINO, CA 92410



MANDATORY DESIGN EXCEPTION ATTACHMENT 11

SCALE: 1"=100'

SHEET 36

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION | CONSULTANT FUNCTIONAL SUPERVISOR | CALCULATED/DESIGNED BY | CHECKED BY | REVISED BY | DATE REVISED

Caltrans

BORDER LAST REVISED 6/1/2009

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => LAN Engineering
DGN FILE => 11 3A Mandatory 36.dgn

CU 00000 | EA 000000

LOCK/PRINT DATE PLOTTED => 6/24/2010
00-00-00 TIME PLOTTED => 11:38:06 AM

All 3A Mandatory 36.dgn 6/24/2010 11:38:06 AM

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII
DESIGN EXCEPTION FEATURE #3 - MINIMUM STOPPING SIGHT DISTANCE AT HORIZONTAL CURVE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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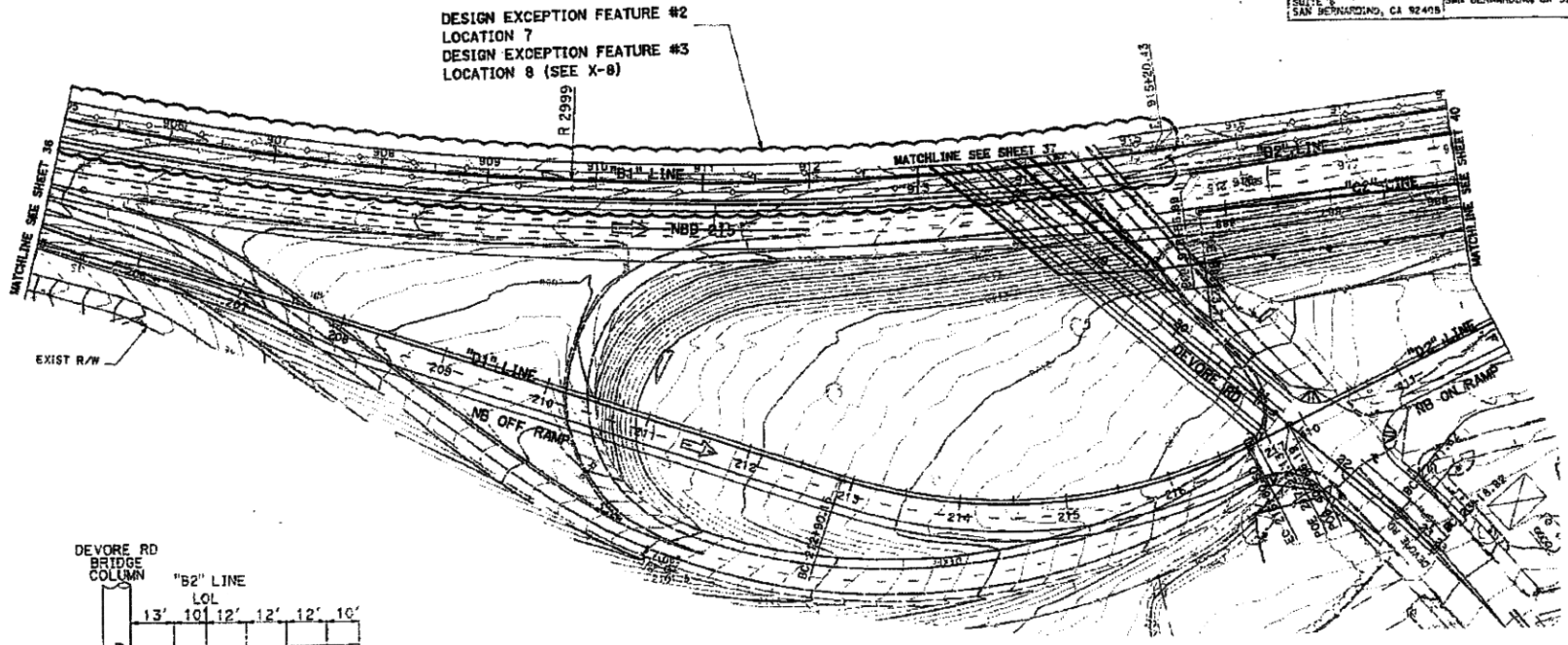
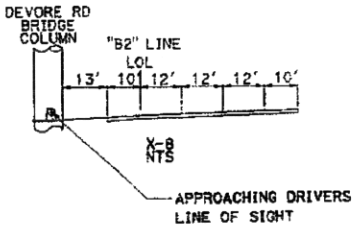
SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410





MANDATORY DESIGN EXCEPTION ATTACHMENT 12

SCALE: 1"=100'

SHEET 38

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

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

BORDER LAST REVISED 4/1/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME =>LAN Engineering
DGN FILE => Alt 3A Mandatory 38.dgn

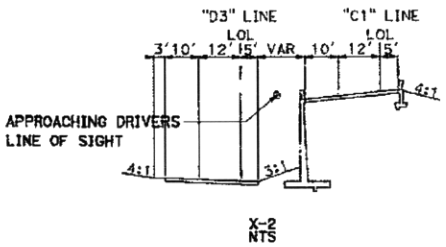
CU 00000 | EA 000000

ALL PLOTTED => 6/24/2010
00-00-00 TIME PLOTTED => 11:38:48 AM

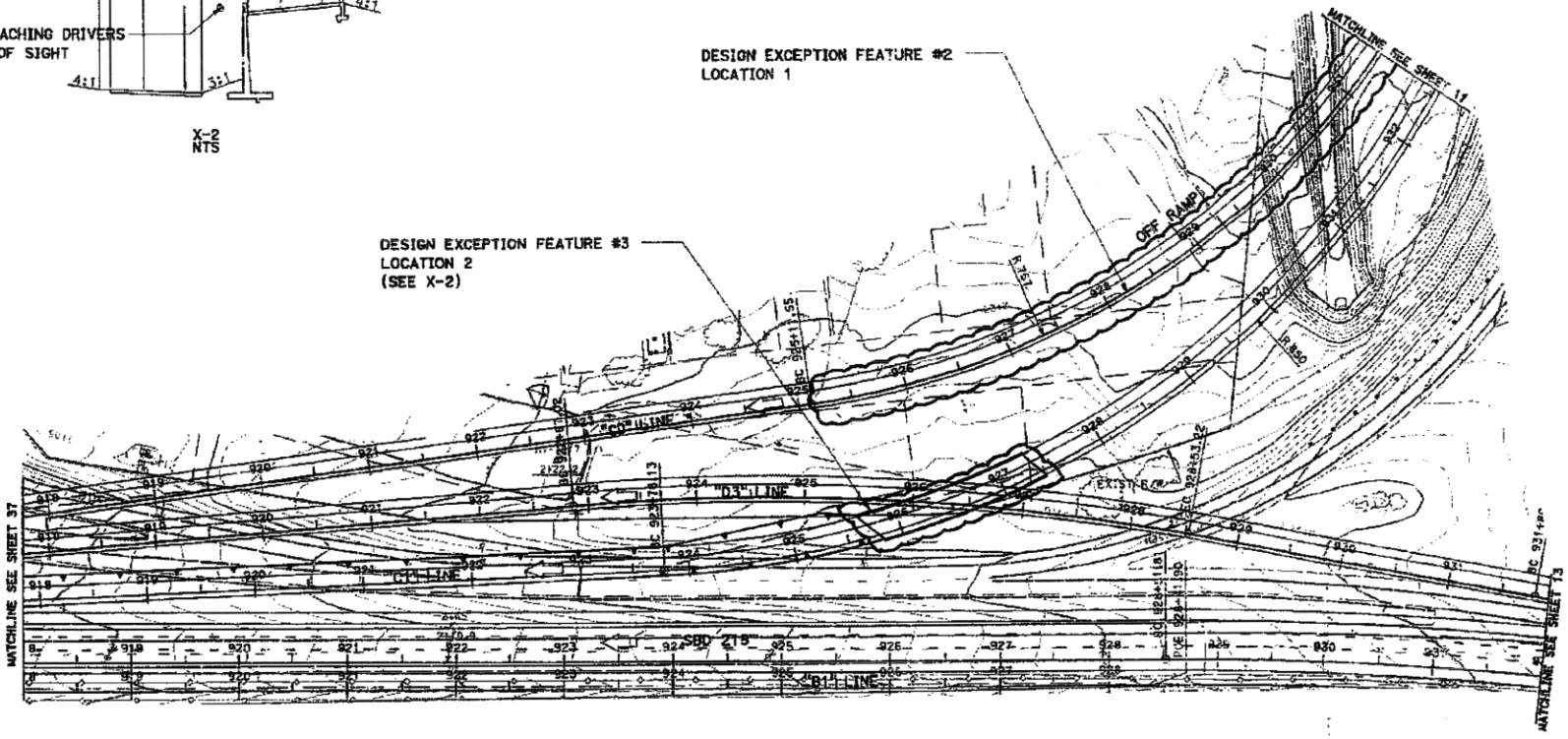
Alt 3A Mandatory 38.dgn 6/24/2010 11:38:48 AM

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII
DESIGN EXCEPTION FEATURE #3 - MINIMUM STOPPING SIGHT DISTANCE AT HORIZONTAL CURVE



X-2
NTS



MANDATORY DESIGN EXCEPTION ATTACHMENT 13

SCALE: 1"=100'

SHEET 39

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08	SBd	15, 215	13.5/18.0, 13.0/17.75		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION | CONSULTANT FUNCTIONAL SUPERVISOR | CALCULATED-DESIGNED BY | CHECKED BY | REVISED BY | DATE REVISED

BORDER LAST REVISED 6/1/2009

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => LAN Engineering
DGN FILE => Att 3A Mandatory 39.dgn

CU 00000 | EA 000000

DATE PLOTTED => 6/24/2010
TIME PLOTTED => 11:39:19 AM

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MANDATORY DESIGN EXCEPTION FEATURES

DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII
DESIGN EXCEPTION FEATURE #3 - MINIMUM STOPPING SIGHT DISTANCE AT HORIZONTAL CURVE

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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

LAN ENGINEERING CORP
1087 BUSINESS CENTER DR
SUITE A
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

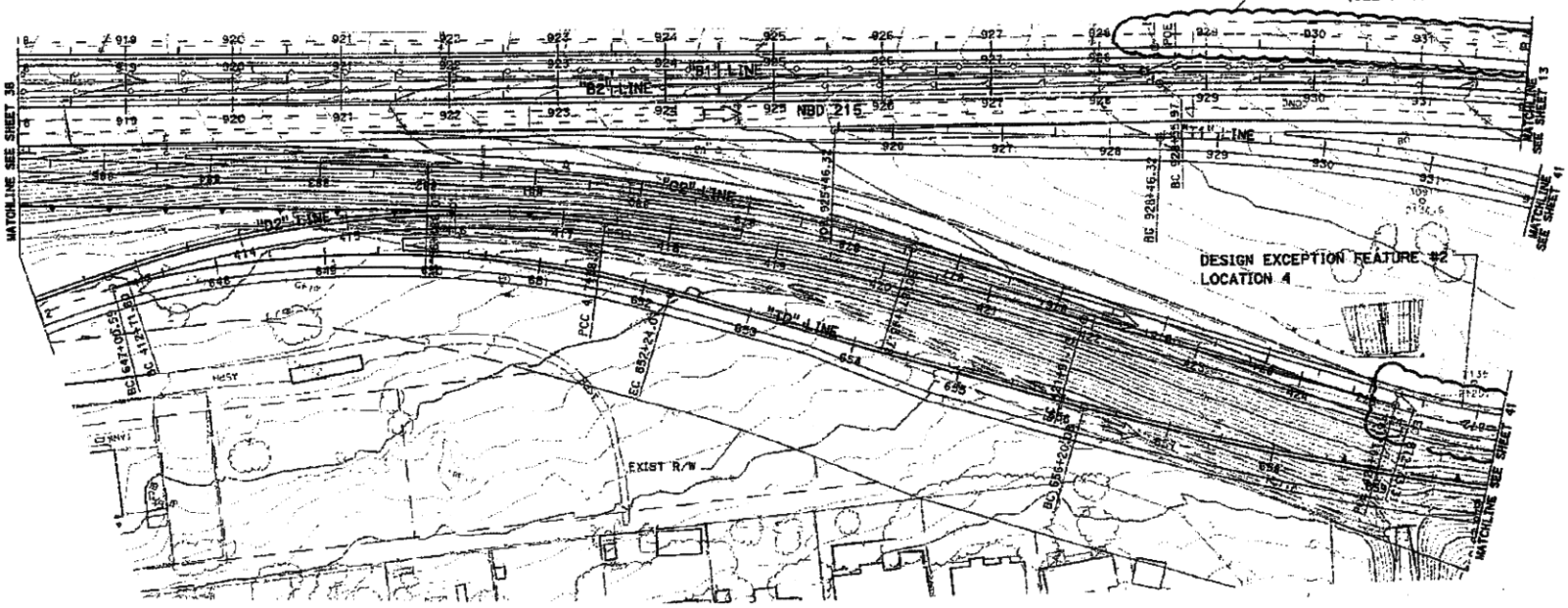
REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

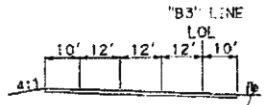
CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

DESIGN EXCEPTION FEATURE #3
LOCATION 7
(SEE X-7)



DESIGN EXCEPTION FEATURE #2
LOCATION 4



X-7
NTS

MANDATORY DESIGN EXCEPTION ATTACHMENT 14

SCALE: 1"=100'

SHEET 40

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DGN FILE => A14 32 eqn system 40.dgn

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MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - MINIMUM HORIZONTAL CURVE RADII

Dist	COUNTY	ROUTE	TOTAL PROJECT	No.	SHEETS
08	SBd	15, 215	13.5/16.0, 10.0/17.73		

REGISTERED CIVIL ENGINEER DATE

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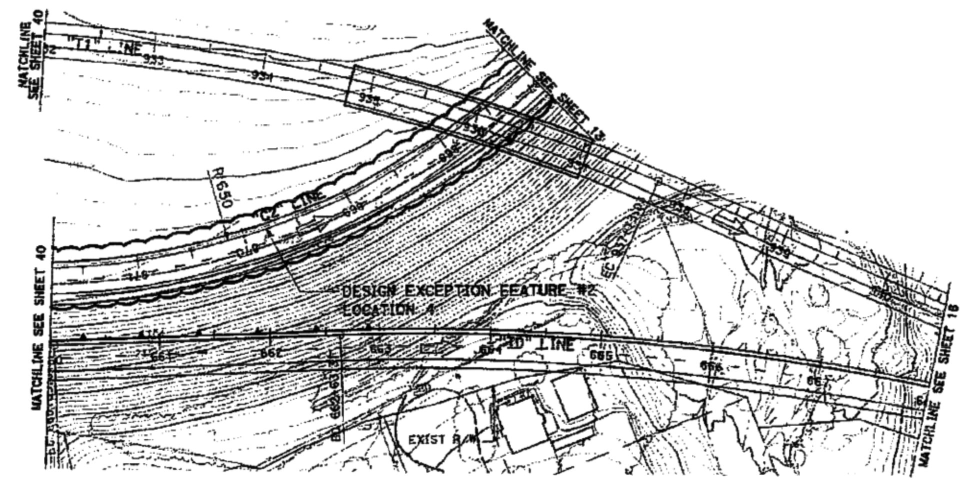
SANBAG, 1170 W 3RD STREET, SAN BERNARDINO, CA 92410



MANDATORY DESIGN EXCEPTION ATTACHMENT 15

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TIME PLOTTED => 11:40:43 AM

LAST REVISION 00-00-00

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Caltrans

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0, 6.0/17.73		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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SUITE 6
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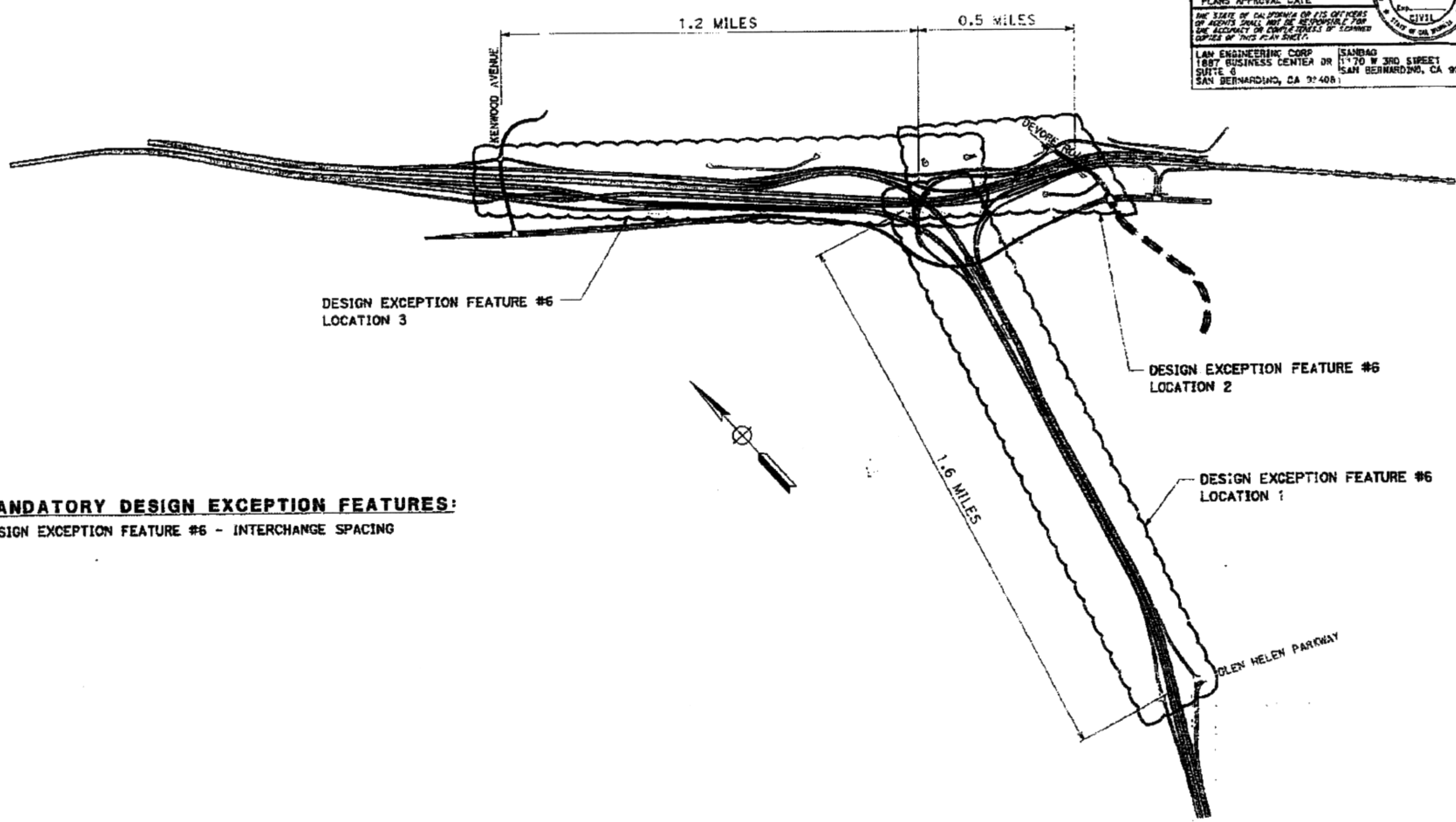

MANDATORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #6 - INTERCHANGE SPACING

MANDATORY DESIGN EXCEPTION ATTACHMENT 16

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IC SPACING

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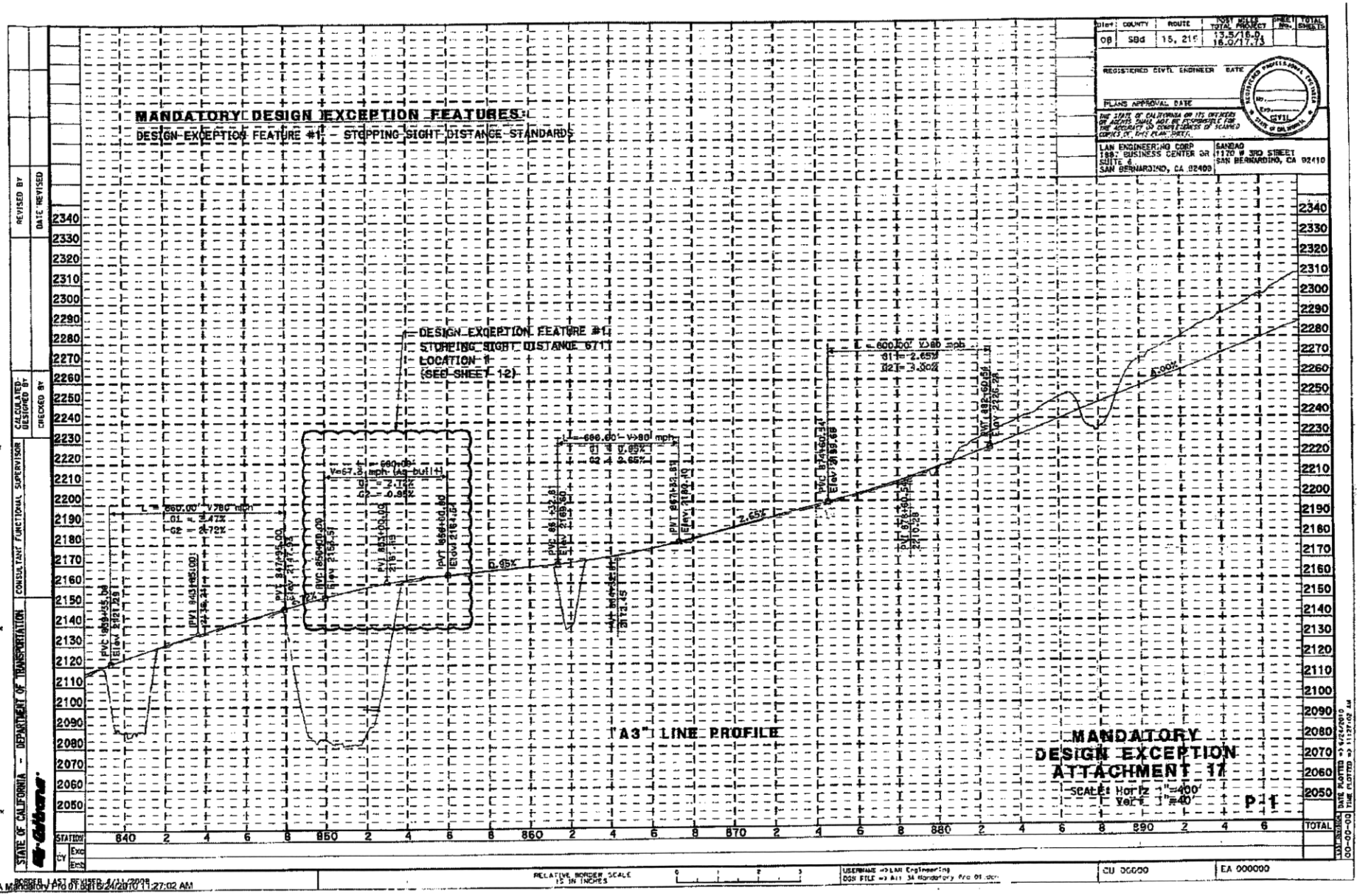
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DESIGN EXCEPTION FEATURE #1 - STOPPING SIGHT DISTANCE STANDARDS
1 - DESIGN EXCEPTION FEATURE #1
STOPPING SIGHT DISTANCE 671'
LOCATION 1
(SEE SHEET 12)
"A3" LINE PROFILE
MANDATORY
DESIGN EXCEPTION
ATTACHMENT 17
SCALE: Horiz 1"=400'
Vert 1"=40'
P1
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
CONSULTANT FUNCTIONAL SUPERVISOR
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REVISED BY
DATE REVISED
REGISTERED CIVIL ENGINEER
DATE
PLANS APPROVAL DATE
LAN ENGINEERING CORP
1887 BUSINESS CENTER DR
SUITE 4
SAN BERNARDINO, CA 92408
SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410
DIST
COUNTY
ROUTE
POST MILES TOTAL PROJECT
SHEET NO.
TOTAL SHEETS
08
SBd
15, 215
13.5/16.9
16.0/17.73
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USERNAME =>LAN Engineering
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TIME PLOTTED => 11:27:02 AM
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EXHIBIT 11-D

Supplemental Fact Sheet Exceptions to Advisory Design Standards

08-SBd-15, 215, PM 14.0/R16.4, 16.0/17.8
EA 08-0K7100
I-15/I-215 Interchange Improvement Project
January 2012

Supplemental Fact Sheet
Exceptions to Advisory Design Standards

REGISTERED PROFESSIONAL ENGINEER
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This Supplemental Fact Sheet Exceptions to Advisory Design Standards is to supplement the original Advisory Fact Sheet Exceptions approved on June 30, 2010, (See Attachment 1).

1. PROPOSED PROJECT

1.1 Proposed Project Description

San Bernardino Associated Governments (SANBAG), in cooperation with California Department of Transportation (Caltrans) proposes to reconfigure Interstate 15/Interstate 215 (I-15/I-215) Interchange near Devore (unincorporated area), County of San Bernardino, CA. These sections of highway are access controlled Interstate Freeways adopted by the California Transportation Commission (CTC) in 1969. The purpose of the proposed project is to eliminate congestion, reduce accidents, restore route continuity for Interstate 15 (I-15), construct truck bypass, and improve non-standard weaving between interchanges. Four alternatives were considered ranging from $264 million to $349 million. Project funding is anticipated to be a combination of State, Federal, Local and Measure I funds.

1.2 Existing Highway

Interstate 15 crosses between the San Gabriel and San Bernardino Mountains in an area known as Cajon Pass. The Cajon Pass area encompasses approximately twelve miles of freeway from Sierra Avenue in Fontana to Oak Hills Road just past the Cajon summit in the Hesperia area.

I-15 is a major south/north route through Riverside and San Bernardino Counties. Interstate 215 (I-215) branches from I-15 in Temecula in Riverside County just north of San Diego County line. The I-15 proceeds north through the cities of Norco and Corona before entering San Bernardino County through the cities of Ontario, Rancho Cucamonga, and Fontana. I-215 ultimately reconnects with I-15 in the Devore area in San Bernardino County. Separation between I-15 and I-215 corridors is generally about fifteen to twenty miles. I-15 provides one of two south/north links with the National Interstate Network in the Riverside and San Bernardino areas.

Within the project limits, I-15 consists of four mixed flow lanes in each direction from Route 60 to Glen Helen Parkway, three mixed flow lanes in each direction from Glen Helen Parkway to I-215, four mixed flow lanes northerly of the junction with I-215, and one truck climbing lane in the northbound direction only.

I-215 is a major route between Temecula and Devore in Riverside and San Bernardino Counties. I-215 begins in Temecula following an old alignment of U.S. Route 395 through Riverside County, passing through Riverside and San Bernardino, and ending at the junction with I-15 in Devore. Within the project limits, I-215 consists of two through mixed flow lanes in each direction.

North Junction of I-15/I-215

This junction is a "Y" type of system interchange that was constructed in the late 1960s with the alignment towards San Bernardino being the primary move and the southwesterly leg being the diverging route. Because of this, the design standards for the diverging route are less than mainline standards for an Interstate. Currently, the design speeds for the I-15 southwest leg to the northwest leg in the NB direction is greater than 80 mph based on the vertical alignment, but is about 69 mph based on the horizontal

alignment, while SB direction is 67 mph (vertical) and 69 mph (horizontal). Therefore, the existing minimum design speeds are less than the desired design standard for an Interstate mainline. The construction of this interchange retained a connection to Devore Road (Glen Helen Parkway) on the I-215 leg which was less than the current standard of a two mile spacing between a system interchange and a service interchange. Along the I-15 alignment, interchanges were constructed at Kenwood which is slightly less than two miles from the system interchange and a local interchange with Glen Helen Parkway to the south, which also is slightly less than the two mile spacing.

1.3 Safety Improvements

Many of the design elements in the project improve current non-standard features, provide additional capacity or make operational improvements that will have an impact to improve safety for the freeway.

The following improvements provided by this project will enhance safety:

- Add truck bypass lanes through the interchange to eliminate difficult auto/truck weaving conflicts.
- Rebuild the I-215/Devore Road Interchange to eliminate non-standard geometric features.
- Reconfigure the existing I-15/Kenwood Avenue interchange to eliminate non-standard geometric features.
- Eliminating the freeway mainline weaving areas: NB I-215 at Devore Road, NB and SB I-15 between I-215 and Kenwood Avenue.

Northbound I-15

- Adding a northbound mainline line between the Glen Helen Parkway off-ramp and the I-215 junction to reduce congestion.
- Adding a northbound auxiliary lane between the Glen Helen Parkway on-ramp and the I-215 junction to improve operation.
- Construct auxiliary lanes to provide for weaving traffic.
- Widen existing Northbound I-15 to Northbound I-15 Connector to add one lane and allow for passing of slower traffic.

Southbound I-15

- Adding a southbound mainline lane between the I-215 junction and the Glen Helen Parkway on-ramp to provide additional capacity.
- Adding a southbound auxiliary lane between the I-215 junction and the southbound Glen Helen Parkway off-ramp to improve operation of the freeway.
- Add auxiliary lanes to provide for merging and diverging traffic.
- Southbound I-15 and I-215 will braid with each other in order to provide route continuity and eliminate a left hand exit ramp.

Northbound I-215

- Construct one additional northbound lane to provide needed capacity.
- Reconfigure the northbound on-ramps at Devore Road to eliminate a loop on-ramp with high accident rate.

- Realign northbound off ramp at Devore Road to make alignment standard.
- Construct Northbound I-215 truck bypass to eliminate auto/truck weaving conflicts.

Southbound I-215

- Reconfigure and add one additional lane to the southbound connector to provide needed capacity.
- Braid the Northbound I-15 to Southbound I-215 connector and the Southbound Devore Road off ramp to eliminate a short weaving area along a CD road.
- Reconstruct southbound off ramp and on ramp approximately 500 feet southerly of the proposed intersection of Glen Helen Parkway with Devore Road to improve geometry.

1.4 Total Project Costs

The total estimated project cost is $264,424,641 and the cost break down is shown in the table below.

Construction Cost:	Alt 3A
Roadway	$163,301,000
Structure	$52,172,000
Right-of-Way Acquisition Cost: (including utility relocation)	$32,127,641
Support Cost: (Permits and Mitigation Expenses)	$16,824,000
Total Project Cost:	**$264,424,641**

NOTE: Estimate from Draft Project Report

2. FEATURES REQUIRING AN EXCEPTION

There are several locations throughout the project limits that require additional advisory design exceptions. (Refer to Attachment 3, Key Map Advisory Design Exception).

2.1 Design Exception Feature #1 – Single-Lane Ramp Widening for Passing

Nonstandard Features (refer to Attachments 4, 5, 6, and 7):

Location 1 (Attachment 4 and 5)
This project proposes a 1,926-ft long single-lane ramp for Line D3 from station 914+33 to station 933+59.

Location 2 (Attachments 4 and 6)
This project proposes a 2,262-ft long single-lane ramp for Line C1 from station 913+16 to station 935+78.

Location 3 (Attachment 4 and 7)
This project proposes a 1,979-ft long single-lane ramp for Line CD from station 914+68 to station 934+47.

Standard for Which Exception is Requested:
Index 504.3(5) – Single-Lane Ramp Widening for Passing - "If the length of a single-lane ramp exceeds 1,000 feet, an additional lane should be provided on the ramp to permit passing maneuvers".

Reasons for Requesting Exception:
The intent of the standard is understood to be for conditions where slow moving vehicles may hinder faster moving traffic for lengthy single-lane ramps. The criteria used to determine whether the standard should apply were high volumes of traffic where there may be a disparity in driving habits (i.e. slow moving vehicles) and lengthy ramps where there are no anticipated locations available for passing maneuvers.

For Locations 1 thru 3, it was determined that none of the above-mentioned criteria are present to fully warrant the inclusion of a passing lane on a ramp based on the following:

Location 1
The D3 ramp has a low traffic volume of 158-veh/hr. It is a 'hook' off ramp located on a 3.07% downgrade at the ending of a 5 mile long downgrade of 4.32%. Approximately halfway along its length it joins into two lanes with the CD off ramp. Near the end of the 'hook' ramp is a 150-ft. radius curve with a 25 mph design speed. Observations of traffic patterns have shown there are few slow moving vehicles on ramp downgrades, if any; thus passing maneuvers on downgrades could lead to excessive speeds of vehicles.

The proposed D3 alignment is a single-lane ramp for a distance of 1,926 feet out of its total length of 3,619 feet. The single-lane ramp is proposed without an additional lane to permit passing maneuvers because:

1. D3 Ramp has a low traffic volume of 158-veh/hr for the 2040 design year. Hence, it's anticipated to have few slow moving vehicles, if any.

2. D3 Ramp is located on a sustained downgrade with few anticipated slow moving vehicles making passing maneuvers less likely to be needed or possible to maneuver.

3. The D3 ramp ultimately widens to 2 or more lanes for the last 1,693 feet of length.

Location 2
The C1 ramp has a moderate traffic volume of 685-veh/hr. It is a connector ramp that begins on a crest vertical curve that transitions into a 6.8% downgrade and then ends on a sag vertical curve on an approximate 3.0% downgrade. Observations of traffic patterns have shown there are few slow moving vehicles on ramp downgrades, if any; thus passing maneuvers on downgrades could lead to excessive speeds of vehicles.

The proposed C1 alignment is a single-lane ramp for a distance of 2,262 feet. The single-lane ramp is proposed without an additional lane to permit passing maneuvers because:

1. C1 Ramp has a moderate traffic volume of 685-veh/hr for the 2040 design year. Hence, it's anticipated to have few slow moving vehicles, if any.

2. C1 Ramp is located on a downgrade with few anticipated slow moving vehicles making passing maneuvers less likely to be needed or possible to maneuver.

Location 3
The CD ramp has a low traffic volume of 482-veh/hr. It is an off ramp that begins on a crest vertical curve that transitions into a 6.8% downgrade and then ends on a sag vertical curve on an approximate 3.0% downgrade. Halfway along its length it joins into two lanes with the D3 'hook' off ramp as described in Location 1. Observations of traffic patterns have shown there are few slow moving vehicles on ramp downgrades, if any; thus passing maneuvers on downgrades could lead to excessive speeds of vehicles.

The proposed CD alignment is a single-lane ramp for a distance of 1,979 feet out of its total length of 3,672 feet. The single-lane ramp is proposed without an additional lane to permit passing maneuvers because:

1. CD Ramp has a low traffic volume of 482-veh/hr for the 2040 design year. Hence, it's anticipated to have few slow moving vehicles, if any.

2. CD Ramp is located on a downgrade with few anticipated slow moving vehicles making passing maneuvers less likely to be needed or possible to maneuver.

3. The CD ramp ultimately widens to 2 or more lanes for the last 1,463 feet of length.

The primary reason for this design exception feature request was based on the application of HDM standards as outlined in section 82.1(1) of the HDM.

Added Cost to Make Standard:

Location 1:
The cost to provide standard is summarized below:

Items	Cost
Roadways	$250,000
Bridge	$200,000
Right of Way	$0
Estimated Cost	**$450,000**

*Total estimated cost does not include cost for Environmental studies and mitigation

Location 2:
The cost to provide standard is summarized below:

Items	Cost
Roadways	$120,000
Right of Way	$0
Estimated Cost	**$120,000**

*Total estimated cost does not include cost for Environmental studies and mitigation

Location 3:
The cost to provide standard is summarized below:

Items	Cost
Roadways	$120,000
Structure	$400,000
Right of Way	$0
Estimated Cost	**$520,000**

*Total estimated cost does not include cost for Environmental studies and mitigation

2.2 Design Exception Feature #2 – Access Rights & Access Control

Nonstandard Features (refer to Attachment 8):

Location 4 (Attachment 8)
This project proposes 54 feet of access control beyond the end of the curb return of the D2 Ramp and Devore Road Junction to the edge of the nearest proposed driveway from station 22+12.16 to 22+62.72 Devore Road.

Standard for Which Exception is Requested:
Index 504.8 - Access Control at Ramp Terminal - "At such junctions, for new construction, access control should extend 100 feet beyond the end of the curb return or ramp radius in urban areas and 300 feet in rural areas, or as far as necessary to ensure that entry onto the facility does not impair operational characteristics."

Reasons for Requesting Exception:
The property adjacent to the proposed Line D2 entrance ramp is a gas station that requires delivery of fuel and gas with tank trailers. The property currently has two access driveways to allow an in and out movement of the tank trailers during fuel and gas deliveries. Acquiring 100 feet of access control would eliminate the proposed driveway and leave only one access driveway to the gas station property. With only one driveway at the property, the onsite circulation of the fuel tank trailers would be significantly affected and this gas station property would become a full property acquisition. To make this feature standard would require additional right of way from the adjacent gas station property and additional environmental studies.

Location 5 (Attachment 8):
This project proposes 39 feet of access control beyond the end of the curb return of the D3/D4 Ramps and Cajon Blvd Junction on the opposite side of the Junction from station 39+97.51 to 40+36.60 Cajon Blvd.

Standard for Which Exception is Requested:
Index 504.8-Access Rights Opposite Ramp Terminals - "For new construction or major reconstruction, access rights should be acquired on the opposite side of the local road from ramp terminals to preclude the construction of future driveways or local roads within the ramp intersection."

Reasons for Requesting Exception:
The access control limits on the opposite side of Cajon Blvd. from the D3/D4 Ramp terminal should match the access control limits proposed at the near side of the ramp terminal; however, there is an existing developed property with driveway access that prevents the access control limits of the opposite side to match the limits of the near side. A fully operational telephone communications facility occupies the property, which requires maintenance personnel to occasionally inspect and maintain equipment housed by the facility. Full acquisition of the property including relocation of all its underground utilities would be required to meet access control standards. Maintaining driveway access to the property will not have any adverse impact on the operation of the proposed D3/D4 ramp junction with Cajon Blvd.

Added Cost to Make Standard:

Location 4:
The cost to provide standard is summarized below:

Items	Cost
Roadways	$0
Right of Way	$1,500,000
Estimated Cost	**$1,500,000***

Location 5:
The cost to provide standard is summarized below:

Items	Cost
Roadways	$0
Right of Way & Utility	$3,000,000
Estimated Cost	**$3,000,000**

*Total estimated cost does not include cost for Environmental studies and mitigation

2.3 Design Exception Feature #3 – Superelevation Transition

Nonstandard Features (refer to Attachments 9 and 10):

Location 6 (Attachment 10)
This project proposes 200 feet of superelevation runoff length along Line D2 southbound I-215 entrance ramp from Devore Road to BC station 412+71.77.

Location 7 (Attachment 9)
This project proposes to maintain an existing superelevation runoff length of 180 feet along Line A1 northbound I-15 at EC station 755+45.14.

Standard for Which Exception is Requested:
Index 202.5(1) – Superelevation Transition - "A superelevation transition should be designed in accordance with the diagram and tabular data shown in Figure 202.5A to satisfy the requirements of safety, comfort and pleasing appearance."

Reasons for Requesting Exception:

Location 6
A standard transition runoff length of 300 feet is not feasible at this location since there is only 235 feet available between the 7% grade of Devore Road to the 12% superelevation of the 400-ft. radius at BC station 412+71.77. Therefore, the proposed design provides a 200-ft. runoff length at a rate of 6% per 100 feet complying with the restrictive condition criteria in HDM 202.5(3). To make this feature standard would require additional right of way from the adjacent gas station property and additional environmental studies.

Location 7
This portion of I-15 was originally constructed as a (6)-six lane highway; (3)-three lanes in each direction separated by a 70-ft. median. The existing superelevation runoff length for (3)-three thru lanes for the existing 4000-ft. radius is 180 feet. The project proposes widening for a (4)-fourth thru lane towards the inside median using a 4001.12-ft. radius and using the existing profile grade lane at the existing edge of traveled way as the axis of rotation. Full width pavement reconstruction would be required to obtain a standard superelevation runoff length for (4)-four thru lanes, however, the preliminary materials report determined there is substantial remaining service life of the existing concrete pavement and only rehabilitation of existing lanes immediately adjacent to the proposed lanes should be performed. Therefore, it is proposed to use the existing superelevation runoff length of 180 feet.

Added Cost to Make Standard:

Location 6:
The cost to provide standard is summarized below:

Items	Cost
Roadways	$0
Right of Way	$1,500,000
Estimated Cost	**$1,500,000***

*Total estimated cost does not include cost for Environmental studies and mitigation

Location 7:
The cost to provide standard is summarized below:

Items	Cost
Roadways	$100,000
Right of Way	$0
Detour/Traffic Handling	$400,000
Estimated Cost	**$500,000**

*Total estimated cost does not include cost for Environmental studies and mitigation

2.4 Design Exception Feature #4 – Superelevation of Compound Curves

Nonstandard Features (refer to Attachments 11 & 12):

Location 8 (Attachment 11)
The project proposes a compound curve along Line CD with radius 1 of 850 feet and 10% superelevation rate at EC station 936+67.26, and radius 2 of 757 feet with 11% superelevation rate at PCC station 934+43.03. The superelevation transitions from radius 1 to radius 2 beginning at station 934+82, 185 feet into radius 1, and ends at PCC station 934+43.03 of radius 2.

Location 9 (Attachment 12)
The project proposes a compound curve along Line A2 with radius 1 of 6000 feet and 2% adverse superelevation at BC station 846+29.75, and radius 2 of 1991.5 feet with 6% superelevation rate at PCC station 858+72.62. The superelevation transitions from radius 1 to radius 2 beginning at station 854+22.62, 793 feet into radius 1, and ends at PCC station 858+72.62 of radius 2.

Standard for Which Exception is Requested:
Index 202.6 – Superelevation of Compound Curves - "Superelevation of compound curves should follow the procedure as shown in Figure 202.6. Where feasible, the criteria in Index 202.5 should apply."

Reasons for Requesting Exception:

Location 8
According to the HDM figure 202.6, case 1 applies since the length of the proposed 850-ft. radius curve is less than 350 feet. The figure shows the transition length between superelevation rates should be proportional between BC and the PCC. However, the geometry of Line CD is such that the super transition for compound curves according to figure 202.6 would be almost entirely on the proposed bridge structure. Superelevation transitions on bridge structures are difficult to construct and almost always result in an unsightly appearance of the bridge and the bridge railing, as stated in HDM 202.5 and 203.9. Therefore, the super transition for the compound curve is proposed to begin off of the proposed bridge structure and end at the PCC at a rate of 6% per 234 feet complying with the restrictive condition criteria in HDM 202.5(3).

Location 9
According to the HDM figure 202.6, case 2 applies since the length of the proposed 6000-ft. radius curve is greater than 350 feet. However, the radius 1 6000-ft. curve was approved with a 2% adverse superelevation rate since it is located on an existing bridge structure that would require complete

reconstruction. Therefore, the super transition for the compound curve is proposed to begin off the existing bridge structure and end at the PCC at a rate of 6% per 338 feet complying with the restrictive condition criteria in HDM 202.5(3).

Added Cost to Make Standard:

Location 8:
The cost to provide standard is summarized below:

Items	Cost
Roadways	$
Right of Way	$
Structure	$6,900,000
Estimated Cost	**$6,900,000**

*Total estimated cost does not include cost for Environmental studies and mitigation

Location 9:
The cost to provide standard is summarized below:

Items	Cost
Roadways	$
Right of Way	$
Structure	$6,900,000
Estimated Cost	**$6,900,000**

*Total estimated cost does not include cost for Environmental studies and mitigation

2.5 Design Exception Feature #5 – Decision Sight Distance at Exits (Horizontal)

Nonstandard Features (refer to Attachment 13):

Location 10 (Attachment 13)
This project proposes 340 feet of horizontal decision sight distance at the Line CD diverge from Line C1 at the northbound I-15 to southbound I-215 connector.

Standard for Which Exception is Requested:
Index 504.2(4)(a) – Decision Sight Distance at Exits - "Decision sight distance given in Table 201.7 should be provided at freeway exits and branch connectors."

Reasons for Requesting Exception:
According to HDM Table 201.7, for a design speed of 50 mph, 750 feet of horizontal decision sight distance should be provided for Line CD freeway exit ramp. The Line CD freeway exit ramp begins on a curve on a proposed bridge structure; therefore horizontal decision sight distance is limited by the proposed concrete barrier on the edge of the bridge structure and the sight distance provided is 340 feet. Since the Line CD exit is located where physical restrictions to visibility cannot be corrected by object removal (the concrete barrier), a 1000-ft. auxiliary lane is provided in advance of the Line CD exit complying with HDM 504.2(3). The design of the auxiliary lane would include overhead signage to alert and notify drivers of the upcoming exit, in lieu of limited horizontal sight distance to the Line CD exit nose.

To make this feature standard, the bridge over Cajon Creek would need to be widened beyond the standard 10-ft shoulder width, which would require additional right of way along with additional environmental mitigation. Specifically, additional bridge widening would increase the mitigation of the critical San Bernardino Kangaroo Rat habitat at 4:1 ratio (i.e. for every acre impacted, 4 acres of mitigation is required). For bridge construction areas over species habitat, impact areas are calculated based on the bridge projection onto the ground where areas are considered as physical take of species habitat due to effect of the shadow. The real impact of any additional bridge widening in this area then would be the effect on the habitat of the endangered species. Therefore, to make the feature standard the costs of the bridge structure, right of way and environmental mitigation would all increase in cost.

Added Cost to Make Standard:

The cost to provide standard is summarized below:

Items	Cost
Roadways	$0
Environmental Mitigation	
Over the creek	$250,000
Right of Way	$0
Structure	$750,000
Estimated Cost	**$1,000,000***

*Total estimated cost does includes cost for Environmental studies

2.6 Design Exception Feature #6 –Decision Sight Distance at Exits (Vertical)

Nonstandard Features (refer to Attachment 13):

Location 11 (Attachment 13)
This project proposes 660 feet of vertical decision sight distance at the Line CD diverge from Line C1 at the northbound I-15 to southbound I-215 connector.

Standard for Which Exception is Requested:
Index 504.2(4)(a) - Decision Sight Distance at Exits - "Decision sight distance given in Table 201.7 should be provided at freeway exits and branch connectors."

Reasons for Requesting Exception:
According the HDM table 201.7, for a design speed of 50-mph, 750 feet of vertical decision sight distance should be provided for Line CD freeway exit ramp. However, the proposed profile of Line CD consists of a vertical curve that constrains vertical sight distance at this location and provides 660 feet of vertical decision sight distance. To make this feature standard, either the vertical curve length must be increased or the diverge point of Line C1 must be moved southerly along Line A2. Both resolutions would require complete reconstruction of the existing Cajon Creek Bridge resulting in additional right of way and additional environmental studies. A 1000-ft. auxiliary lane including overhead signage to alert and notify drivers of the upcoming exit is proposed in advance of the Line CD exit, in lieu of limited vertical sight distance to the Line CD exit nose.

Added Cost to Make Standard:

The cost to provide standard is summarized below:

Items	Cost
Roadways	$0
Right of Way	$0
Structure	$6,900,000
Estimated Cost	**$6,900,000***

*Total estimated cost does not include cost for Environmental studies and mitigation

2.7 Design Exception Feature #7– Compound Curves

Nonstandard Features (refer to Attachment 10):

Location 12 (Attachment 10)
This project proposes a compound curve along Line D2 with radius 1of 400 feet at BC station 412+71.77 and radius 2 of 1,500 feet at PCC station 414+24.74.

Standard for Which Exception is Requested:
Index 203.5 - Compound Curves - "The shorter radius should be at least two-thirds the longer radius when the shorter radius is 1,000 feet or less."

Reasons for Requesting Exception:
The project proposes to modify the existing 'trumpet' design (Type L-11) of the northbound I-215 and Devore Road interchange to a 'compact diamond' (Type L-1) interchange design. Since the Devore Road overcrossing is skewed at 45 degrees with I-215 and the Line C2 connector ramp is very near the proposed I-215 northbound freeway entrance location from Devore Road, the Line D2 freeway entrance must be on a compound curve alignment. The proposed compound curved alignment is approximately 300 feet into the entrance ramp from Devore Road and provides a sufficient design speed of 35 mph through the compound curve. To make this feature standard would require additional right of way from the adjacent gas station property and additional environmental studies.

Added cost to Make Standard:

The cost to provide standard is summarized below:

Items	Cost
Roadways	$0
Right of Way	$1,500,000
Estimated Total Cost	**$1,500,000***

*Total estimated cost does not include cost for Environmental studies and mitigation

3. TRAFFIC DATA

A Traffic Report was prepared by Iteris for the project. The SCAG "interim" travel model was utilized to develop traffic forecasts for year 2040 conditions. The interim model is the most current model available from SCAG. The forecast 2040 average daily traffic (ADT) volumes range from 122,000 to 191,100 vehicles along the I-15 and from 65,400 to 80,400 vehicles along the I-215.

Traffic volumes in the corridor are forecast to more than double by 2040. The peak hour directional volumes on I-15 are forecast to range between 4,988 vehicles/hour (A.M. Northbound, I-215 SB Connector to I-215 NB Connector) and 14,452 vehicles/hour (A.M. Southbound, North of Kenwood to Kenwood Ave Off-Ramp). The peak hour directional volumes on I-215 are forecasted to range between 2,840 vehicles/hour (A.M. Northbound, Palm Ave Off-Ramp to Palm Ave On-Ramp) and 6,749 vehicles/hour (A.M. Southbound, Palm Ave On-Ramp to University Pkwy Off-Ramp). Table 1 provides a comparison of the existing and year 2040 mainline peak-hour volumes.

Table 1: Freeway Mainline Peak Hour Demand Comparison

Freeway Segment	A.M. Peak Hour			P.M. Peak Hour		
	Year 2007	Year 2040	% Growth	Year 2007	Year 2040	% Growth
I-15 Northbound						
Sierra Ave On Ramp to Glen Helen Pkwy Off Ramp	2,132	5,898	177	4,107	8,862	116
Glen Helen Pkwy Off Ramp to Glen Helen Pkwy On Ramp	2,068	5,704	176	3,929	8,392	114
Glen Helen Pkwy On Ramp to I-215 SB Connector	2,084	5,808	179	3,983	8,880	123
I-215 SB Connector to I-215 NB Connector	1,740	4,988	187	3,654	8,086	121
I-215 NB Connector to Kenwood Ave Off Ramp	2,595	7,931	206	5,990	13,567	126
Kenwood Ave On Ramp to North of Kenwood	2,573	7,871	206	5,904	14,061	138
I-15 Southbound						
North of Kenwood to Kenwood Ave Off Ramp	6,659	14,452	117	3,714	11,119	199
Kenwood Ave Off Ramp to Kenwood Ave On Ramp	6,644	13,869	109	3,705	11,108	200
Kenwood Ave On Ramp to I-215 SB Connector	6,832	14,079	106	3,754	11,198	198
I-215 SB Connector to I-215 NB Connector	4,170	8,385	101	2,663	7,099	167
I-215 NB Connector to Glen Helen Pkwy Off Ramp	4,707	9,042	92	3,138	7,794	148
Glen Helen Pkwy On Ramp to Sierra Ave Off Ramp	4,741	9,424	99	3,187	7,920	149
I-215 Northbound						
University Pkwy On Ramp to Palm Ave Off-ramp	1,231	3,711	210	2,693	6,713	149
Palm Ave Off Ramp to Palm Ave On Ramp	896	2,840	217	2,231	5,571	150
Palm Ave On Ramp to Devore Road Off Ramp	1,301	3,293	153	2,783	6,184	122
Devore Road Off Ramp to Devore Road On Ramp	1,231	3,143	155	2,657	5,949	124
Devore Road On Ramp to I-15 SB Connector	1,392	3,600	159	2,811	6,185	120

I-215 Southbound						
I-215 SB Connector to I-215 SB	2,662	5,694	114	1,091	4,101	276
CD Off Ramp to CD On Ramp	2,607	5,536	112	1,051	4,016	282
CD On Ramp to Palm Ave Off Ramp	2,965	6,471	118	1,440	4,462	210
Palm Ave Off Ramp to Palm Ave On Ramp	2,380	5,688	139	1,172	4,187	257
Palm Ave On Ramp to University Pkwy Off Ramp	2,913	6,749	132	1,640	5,151	214

Table 2 shows the Opening Year 2017 and Design Year 2040 peak hour volumes for various ramp locations.

Table 2: I-15/I-215 Ramp Traffic Volumes

Ramp	Year 2017		Year 2040	
	AM	PM	AM	PM
I-15 Northbound				
Off Ramp to Glen Helen Pkwy	101	272	194	470
On Ramp from Glen Helen Pkwy	43	189	104	488
Off Ramp to I-215 SB Connector	486	469	820	793
Off Ramp to Kenwood Avenue	51	190	79	309
On Ramp from Kenwood Avenue	17	279	20	794
I-15 Southbound				
Off Ramp to Kenwood Avenue	188	9	584	11
On Ramp from Kenwood Avenue	194	59	210	90
On Ramp from I-215 Connector	0	0	0	0
Off Ramp to Glen Helen Pkwy	71	29	152	64
On Ramp from Glen Helen Pkwy	210	100	535	190
I-215 Northbound				
Off Ramp to Palm Avenue	491	665	871	1143
On Ramp from Palm Avenue	418	569	453	613
Off Ramp to Devore Road	92	157	150	235
On Ramp to Devore Road	248	176	457	236
I-215 Southbound				
Off Ramp to CD	86	53	158	85
On Ramp from CD	532	405	935	447
Off Ramp to Palm Avenue	643	269	784	275
On Ramp from Palm Avenue	692	611	1061	963

4. ACCIDENT DATA

Caltrans District 8 provided Traffic Accident Surveillance and Analysis System (TASAS) data along I-15 (PM 14.0 to R16.4) and I-215 (PM 16.00 to 17.75). This data covered the project area and was for the period of July 01, 2007 through June 30, 2010.

Table 3: TASAS Accident Rate from 07/01/2007 to 06/30/2010

Location	Actual *(Per MVM for mainline, per MV for ramp)*			Average *(Per MVM for mainline, per MV for ramp)*		
	Fatal	**F + I**	**Total**	**Fatal**	**F + I**	**Total**
Route 15 Mainline:						
Mainline, NB from PM 14.000 to 15.100	0.000	0.27	0.71	0.011	0.29	0.82
Mainline, NB from PM 15.101 to 16.373	0.000	0.09	0.32	0.012	0.30	0.87
Mainline, NB from PM R14.273 to R14.990	**0.016**	0.15	0.51	0.008	0.23	0.64
Mainline, NB from PM R14.991 to R16.100	0.000	**0.31**	0.59	0.008	0.23	0.64
Mainline, SB from PM 14.000 to 14.400	0.000	0.07	0.17	0.010	0.26	0.74
Mainline, SB from PM 14.401 to 16.100	0.008	0.22	0.49	0.012	0.30	0.87
Mainline, SB from PM 16.101 to 16.373	0.000	**0.15**	0.35	0.012	0.30	0.87
Mainline, SB from PM R14.048 to R14.960	**0.026**	**0.37**	**0.84**	0.008	0.23	0.64
Mainline, SB from PM R14.961 to R16.400	**0.024**	**0.33**	**0.77**	0.008	0.23	0.64
Mainline, NB from R13.799 to R14.275 *	**0.025**	0.12	0.20	0.011	0.29	0.81
Mainline, SB from R13.799 to R14.048 *	0.000	0.24	0.42	0.014	0.34	0.97
Route 15 Ramps:						
NB Exit to Glen Helen Pkwy, PM 14.565	0.000	**2.11**	**3.51**	0.007	0.37	1.20
SB Entrance from Glen Helen Pkwy, PM 14.587	0.000	0.00	0.00	0.004	0.18	0.60
SB Exit to Glen Helen Pkwy, PM 14.996	0.000	0.00	0.46	0.007	0.37	1.20
NB Entrance from Glen Helen Pkwy, PM 15.008	0.000	0.00	**2.28**	0.004	0.18	0.60
NB Exit to SB I-215, PM 16.137	0.000	**0.12**	0.12	0.003	0.10	0.30
SB Exit to SB I-15, PM R14.048 **	0.000	0.00	0.03	0.003	0.10	0.30
NB Entrance from NB I-15, PM R14.273 **	0.000	0.00	0.00	0.005	0.20	0.60
SB Entrance from Kenwood Ave, PM R14.787	0.000	0.00	0.00	0.004	0.18	0.60
NB Exit to Kenwood Ave, PM R14.806	0.000	0.00	0.65	0.007	0.37	1.20
SB Exit to Kenwood Ave, PM R15.200	0.000	**7.60**	**15.21**	0.007	0.37	1.20
NB Entrance from Kenwood Ave, PM R15.210	0.000	0.00	0.00	0.004	0.18	0.60

Location	Actual *(Per MVM for mainline, per MV for ramp)*			Average *(Per MVM for mainline, per MV for ramp)*		
	Fatal	**F + I**	**Total**	**Fatal**	**F + I**	**Total**
Route 215 Mainline:						
Mainline, NB from PM 16.00 to 17.753	**0.016**	0.17	0.42	0.009	0.24	0.70
Mainline, SB from PM 16.00 to 17.753	**0.016**	**0.34**	0.75	0.009	0.24	0.70
Route 215 Ramps:						
SEG SB Entrance from Cajon Blvd, PM 17.075	0.000	0.00	**1.52**	0.004	0.23	0.70
NB Exit to Devore Road, PM 17.146	0.000	**2.11**	**3.51**	0.004	0.42	1.20
NB Entrance from Devore Road, PM 17.253	0.000	**0.61**	**1.52**	0.008	0.16	0.55
NB Exit to SB I-15, PM 17.489	0.000	0.00	0.10	0.007	0.26	0.80
SEG SB Exit to Cajon Blvd, PM 17.654	0.000	0.00	**6.52**	0.004	0.23	0.70

* TASAS identifies this as part of the I-15 'mainline', however it is actually a portion of the northbound and southbound I-215 connectors.
** TASAS identifies this as a 'ramp' to the freeway but actually it is the I-15 'mainline' northbound and southbound.
Note: **BOLD #** Indicate actual is higher than the statewide average.

The TASAS data indicates that the accident (fatal and fatal/injury) rates are higher than the statewide average for similar facilities with comparable traffic volumes.

Within the project limits the data revealed a total of 537 accidents of which 10 were fatal (1.86%), 217 were injuries (40.41%) and 310 were property damage only (57.73%). The types of the accidents are summarized in the following table:

Table 4: Type of Collision

Type of Collision	Number	Percent in Total (%)
Rear End	161	29.98
Hit Object	154	28.68
Sideswipe	129	24.02
Overturn	51	9.50
Broadside	25	4.66
Other	9	1.68
Auto/Pedestrian	3	0.56
Head On	2	0.37
Not Stated	3	0.56

The primary collision patterns are summarized in the following table:

Table 5: Primary Collision Factor

Primary Collision Factor	Number	Percent in Total (%)
Excessive Speed	188	35.01
Improper Turn	137	25.51
Other Violation	127	23.65
Driving Under Influence	44	8.19
Other Than Driver	18	3.35
Failure to Yield	14	2.61
Following Too Close	7	1.30
Unknown	2	0.37

The project is expected to reduce congestion and improve operations on I-15 and I-215 and as a result is anticipated to also reduce the accident rates in the area.

4.1 Accident Analysis

The accident rates within the project limits vary from above to below the statewide average for similar facilities. This discussion will address the higher accident rates to identify the possible causes and corrective actions that can be implemented in this project.

The northbound I-15 from the I-15/I-215 Interchange to north of the Kenwood Avenue Interchange (PM R14.99 to R16.1) has accident rates higher than the statewide average for similar facilities. This is the location where the freeway merges with the lanes from I-215. Northbound trucks from I-215 must merge onto I-15 and weave across to reach the slow lanes. There is also a non-standard weaving distance to the Kenwood exit ramp. It is believed that many of the accidents in this area are related to these weaving / merging maneuvers. This project will construct northbound truck bypass lanes in all of the alternatives, which will reduce the truck weaving maneuver and the congestion related to it. The northbound Kenwood exit ramp will only be accessible from the truck bypass, thus eliminating the non-standard weaving section. A reduction in the accident rate is anticipated.

Southbound I-15 from north of the Kenwood Avenue Interchange to the I-15/I-215 Interchange (PM R14.0 to R16.4) has an accident rate higher than the statewide average for similar facilities. This is in the location where two auxiliary lanes are added prior to the I-15 diverge from the mainline on the right side. There is also a non-standard weaving area between the southbound Kenwood entrance ramp and the I-215 diverging on the left creating a short weaving area for the number of lanes which need to be crossed to access the I-215 connector. It is believed that the substantial number of lane changes associated with I-15 traffic staying on I-15 is causing congestion in this area and contributes to the higher accident rates. Alternative 3A resolves the issue associated with the right side I-15 diverge. Route continuity is provided with the I-215 traffic diverging to the right and I-15 auto traffic staying in the three left lanes. The southbound Kenwood entrance ramp cannot access I-215 in this configuration also eliminating the non-standard weave. This design is anticipated to reduce the accident rate in this area.

The northbound exit and entrance ramps at Glen Helen Parkway have higher accident rates than similar facilities statewide. This is the location where the freeway narrows from four to three lanes and typically

has recurring congestion in the evenings. This project will add one through lane and one auxiliary lane within this area to reduce congestion. A corresponding reduction in the accident rate is anticipated.

The northbound exit ramp at Kenwood Ave has a slightly higher accident rate than similar facilities statewide. It is believed that this has the same cause as the I-15 mainline; weaving and merging of vehicles within a non-standard weaving distance. The reconfiguration of the exit ramp from the truck bypass lanes is anticipated to reduce the accident rate for the ramp.

The southbound Kenwood exit ramp has an accident rate higher than the statewide average for similar facilities. This high rate (15.21 vs. 1.20) can be attributed to only a few accidents on a relatively low volume ramp. These accidents mostly involve trucks descending Cajon Pass and experiencing what appears to be brake failure, or the inability to stop at the ramp termini.

The southbound I-215 mainline has an accident rate slightly higher than the statewide average for a similar facility. Improvements in this area will add a third lane and a wider left shoulder. These improvements should improve the situation.

The southbound I-215 CD road (PM 17.075 and 17.654) has an accident rate higher than the statewide average for a similar facility. This collector-distributor road has a very short weaving section where traffic from the northbound I-15 connector merges with southbound I-215 traffic going to the Devore Rd. exit ramp. This exit ramp also has a tight radius 'hook' configuration. The southerly end of this weaving section also has a crest vertical curve with limited sight distance. These three factors contribute to the high accident rate. In Alternative 3A the weaving section is eliminated by braiding the Devore Rd. exit ramp. The I-215 southbound Devore Rd. hook ramps are moved further south, a larger radius is provided, and a longer deceleration distance provided prior to the first curve. All of these proposed designs are anticipated to reduce the accident rate along this section of freeway.

The northbound I-215 exit and entrance ramps at Devore Rd. have accident rates higher than the statewide average for a similar facility. The non-standard geometric configuration of the ramps may be a contributing factor to the higher accident rates. The entrance ramp has a compound curve ending in a very tight loop, and merges with high speed auxiliary lanes. Following the merge onto the I-215 mainline there is an immediate weaving area prior to the southbound I-15 connector. Alternative 3A will eliminate the loop entrance ramp to northbound I-215 as well as the short auxiliary lane. The proposed design provides a direct ramp to northbound I-15 & southbound I-15.

5. INCREMENTAL IMPROVEMENTS

None.

6. FUTURE CONSTRUCTION

This project is compatible with the proposed I-15 ultimate facility currently under study by SANBAG and Caltrans. The Route Concept Fact Sheet dated 1999, only addresses ultimate facility as being an 8+2 freeway. The I-15 Corridor Feasibility Study has three conceptual elements for the ultimate facility. When finally approved, these features will be incorporated into the new Route Concept Report currently being updated by Caltrans. The three elements being considered are:

- Add two HOV lanes (traditional widening adjacent to #1 lane)

- Construct 'Managed' lanes (similar to the reversible lanes in San Diego on I-15)
- Construct barrier separated "Truck Only" Lanes.

The managed lane concept could be 2, 3 or 4 lanes wide with or without a movable barrier to reconfigure the number of lanes in the heavier direction of travel. Reversible use of these lanes would favor the heaviest demand direction. The HOV and Managed lanes can be accommodated in the median of the south leg of I-15. The truck lane concept takes up the most width which would require outside widening of the south leg of I-15. The north leg of I-15 presents a challenge to this project because it is unknown which alternative will be selected for the corridor. The northbound and southbound roadbeds are on independent profiles and are separated vertically by up to15 feet. Addition of any lanes in the median will require extensive use of retaining walls for several miles.

An optional configuration on this leg would be to construct a 3rd roadbed on an independent profile further up the side of the hill, easterly of the northbound lanes. This new roadbed could be used for either the northbound mainline or the new 'managed' or 'truck' lanes. The existing northbound roadbed might be used for the managed/truck lanes if the northbound auto traffic uses the new roadbed. Close coordination with the corridor project will be needed as final design approaches.

The I-215 corridor also needs to be considered in these designs as it has not been built to its ultimate width which is 8 MF lanes + 2 HOV lanes. The August 1999 Route Concept Fact sheet identified the need for two HOV lanes on this section of I-215 just to meet the 2015 traffic demand. A revised Route Concept Report is being prepared by Caltrans at this time. The ultimate facility for I-215 will be considered in the development of this project.

7. PROJECT REVIEWS, CONCURRENCE

The exception has been reviewed during the Geometric Approval Drawing phase by the following individuals:

1. Anthony Ng, P.E., Headquarters Design Reviewer
2. Robert Lyles, P.E., Design Oversight Engineer
3. Theresa Sasis, P.E., Traffic Operations Reviewer

8. ATTACHMENTS

Attachment 1 - Approved Fact Sheet Exceptions to Advisory Design Standards

Attachment 2 - Location Map

Attachment 3 - Key Map Advisory Design Exception

Attachment 4 - Design Exception Feature #1 (Location 1, 2, 3)

Attachment 5 - Design Exception Feature #1 (Location 1)

Attachment 6 - Design Exception Feature #1 (Location 2)

Attachment 7 - Design Exception Feature #1 (Location 3)

Attachment 8 - Design Exception Feature #2 (Location 4, 5)

Attachment 9 - Design Exception Feature #3 (Location 7)

Attachment 10 - Design Exception Feature #3 (Location 6)
Design Exception Feature #7 (Location 12)

Attachment 11 - Design Exception Feature #4 (Location 8)

Attachment 12 - Design Exception Feature #4 (Location 9)

Attachment 13 - Design Exception Feature #5 (Location 10)
Design Exception Feature #6 (Location 11)

Attachment 1

08-SBd-15, 215, PM 14.0/R16.4, 16.0/17.8
EA 08-0K7100
I-15/I-215 Interchange
February 2010

Fact Sheet Exceptions to Advisory Design Standards

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1. PROPOSED PROJECT

1.1. Proposed Project Description

San Bernardino Associated Governments (SANBAG), in cooperation with California Department of Transportation (Caltrans) proposes to reconfigure Interstate 15/Interstate 215 (I-15/I-215) Interchange near Devore (unincorporated area), County of San Bernardino, CA. These sections of highway are access controlled Interstate Freeways adopted by the California Transportation Commission (CTC) in 1969. The purpose of the proposed project is to eliminate congestion, reduce accidents, restore route continuity for I-15, construct truck bypass lanes, and improve non-standard weaving between interchanges. Three alternatives were considered ranging from $350 million to $437 million. Project funding is anticipated to be a combination of State, Federal, Local and Measure I funds. The support cost of the PA & ED is estimated to be $3.5 million.

1.2. Existing Highway

Interstate 15 crosses between the San Gabriel and San Bernardino Mountains in an area known as Cajon Pass. The Cajon Pass area encompasses approximately twelve miles of freeway from Sierra Avenue in Fontana to Oak Hills Road just past the Cajon summit in the Hesperia area.

I-15 is a major south/north route through Riverside and San Bernardino Counties. I-215 branches from I-15 in Temecula in Riverside County just north of San Diego County line. The I-15 proceeds north through the cities of Norco and Corona before entering San Bernardino County through the cities of Ontario, Rancho Cucamonga, Fontana and Rialto. I-215 ultimately reconnects with I-15 in Devore area in San Bernardino County. Separation between I-15 and I-215 corridors is generally about fifteen to twenty miles. I-15 provides one of two south/north links with the National Interstate Network in the Riverside and San Bernardino areas.

Within the project limits, I-15 consists of four mixed flow lanes in each direction from Route 60 to Glen Helen Parkway three mixed flow lanes in each direction from Glen Helen Parkway to I-215, and four mixed flow lanes northerly of the junction with I-215, and one truck climbing lane in the northbound direction only.

Interstate 215 is a major route between Temecula and Devore in Riverside and San Bernardino Counties. I-215 begins in Temecula following an old alignment of U.S. Route 395 through Riverside County, passing through Riverside and San Bernardino, and ending at the junction with I-15 in Devore. Within the project limits, I-215 consists of two through mixed flow lanes in each direction.

NORTH JUNCTION OF I-15/I-215

This junction is basically a "Y" type of system interchange that was constructed in the late 1960s with the alignment towards San Bernardino being the primary move and the southwesterly leg being the diverging route. Because of this, the design standards for the diverging route are less than mainline standards for an Interstate. Currently, the design speeds for the I-15 southwest leg to the Northwest leg in the NB direction is greater than 80 mph based on the vertical alignment, but is about 69 mph based on the horizontal alignment, while SB direction is 67 mph (vertical) and 69 (horizontal). Therefore, the existing minimum design speeds are less than the desired design standard for an Interstate mainline. The construction of this interchange retained a connection to Devore Road (Glen Helen Parkway) on the I-215 leg which was less than the current standard of a two mile spacing between a system interchange and a service interchange. Along the I-15 alignment, interchanges were made at Kenwood which is slightly less than two miles from the system interchange and a local interchange with Glen Helen Parkway to the south, which also is slightly less than the two mile spacing.

1.3. Safety Improvements

Many of the design elements in the project improve current non standard features, provide additional capacity or make operational improvements that will have an impact to improve safety for the freeway.

The following improvements provided by this project will enhance safety:

- Add truck bypass lanes through the interchange to eliminate difficult auto/truck weaving conflicts.
- Rebuild the I-215/Devore Road Interchange to eliminate non-standard geometric features.
- Reconfigure the existing I-15/Kenwood Avenue interchange to eliminate non-standard geometric features.
- Eliminating the freeway mainline weaving areas: NB I-215 at Devore Road, NB and SB I-15 between I-215 and Kenwood Avenue.

Northbound I-15

- Adding a northbound mainline line between the Glen Helen Parkway off-ramp and the I-215 junction to reduce congestion.
- Adding a northbound auxiliary lane between the Glen Helen Parkway on-ramp and the I-215 junction to improve operation.
- Construct auxiliary lanes to provide for weaving traffic.
- Widen existing Northbound I-15 to Northbound I-15 Connector to add one lane and allow for passing of slower traffic.

Southbound I-15

- Adding a southbound mainline lane between the I-215 junction and the Glen Helen Parkway on-ramp to provide additional capacity.
- Adding a southbound auxiliary lane between the I-215 junction and the southbound Glen Helen Parkway off-ramp to improve operation of the freeway.
- Add auxiliary lanes to provide for merging and diverging traffic.
- Southbound I-15 and I-215 will braid with each other in order to provide route continuity and eliminate a left hand exit ramp.

Northbound I-215

- Construct one additional northbound lane to provide needed capacity.
- Reconfigure the northbound on-ramps at Devore Road to eliminate a loop on-ramp with high accident rate.
- Realign northbound off ramp at Devore Road to make alignment standard.
- Construct Northbound I-215 truck bypass to eliminate auto/truck weaving conflicts.

Southbound I-215

- Reconfigure and add one additional lane to the southbound connector to provide needed capacity.
- Braid the Northbound I-15 to Southbound I-215 connector and the Southbound Devore Road off ramp to eliminate a short weaving area along a CD road.
- Reconstruct southbound off ramp and on ramp approximately 500 feet southerly of the proposed intersection of Glen Helen Parkway with Devore Road to improve geometry.

1.4. Total Project Costs

The total estimated project cost within the project limits consists of (1) construction cost, (2) right-of-way acquisition cost and (3) Support Cost as follows:

(1) Construction Cost:	Alt 3A
Roadway	$187,391,000
Structure	$54,500,000
(2) Right-of-Way Acquisition Cost: (including utility relocation)	$47,937,240
(3) Support Cost: (Permits and Mitigation Expenses)	$24,688,280
Total Project Capital Cost:	**$314,517,000**

2. FEATURES REQUIRING AN EXCEPTION

There are seventeen locations that require advisory design exceptions (Refer to Attachment 2, Key Map for sheet locations for Advisory Design Exceptions).

2.1. Design Exception Feature #1 – Stopping Sight Distance

Nonstandard Features (refer to Attachments 7 & 18):
Along the existing "A3" Line, southbound I-15 mainline, the existing profile, prior to Cajon Creek Bridge, consists of a 600' vertical curve. 20% increase in stopping sight distance is not incorporated into the design

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 201.3 - Stopping Sight Distance
"The stopping sight distances in Table 201.1 should be increased by 20 percent on sustained downgrades steeper than 3 percent and longer than one mile."

Reasons for Requesting Exception:
Prior to the Cajon Creek crossing, the southbound I-15 is on a downgrade for over 1 mile at a gradient of 4- 4.5% which requires the application of this standard to increase the SSD by 20%. The provided SSD is 671 feet and the required SSD is 930 feet plus 186 feet (20%). Where the southbound lanes cross over Cajon Creek the freeway is on a crest vertical curve. This vertical curve is actually ½ mile beyond the end of the steeper grade which requires the 20% increase. The profile immediately preceding this curve is only at a -1% grade. The following narrative documents the decisions related to this particular feature.

It is proposed to keep the profile of this location per the existing to minimize on impacts to the creek, which is under the jurisdiction of State and Federal agencies being a "Water of the US" or 'Water of the State" below the bridge. The bridge is a large structure over Cajon Creek and in order to apply this standard would require either an entirely new bridge to be constructed westerly of the existing one, or reduce traffic to only 2 lanes while a new structure on the new profile is constructed beside it. The replacement of this structure would require 2 stages impacting traffic for 18-24 months. If a new bridge on a new alignment were constructed the impacts would be that a large area of the San Bernardino Kangaroo Rat (SBKR) habitat would need to be mitigated as well as acquiring a "1601" permit covering a larger area than currently proposed. Also, one of the main benefits of Alt 3A was to utilize as much of the existing pavement and structures as possible and save on cost. To make

standard, a complete replacement of the existing structures and a portion of the existing roadway would be required. Drivers traveling along this segment of the A3 Line, southbound I-15 would not be able to see vehicle taillights for the required SSD in this particular area. Also, more time is needed for the reconstruction resulting in an increased exposure to traffic. The actual accident rates for this section of southbound I-15 (PM 12.500 to 16.373) are below the statewide average for a similar highway facility as shown in Table 4.

Added Cost to Make Standard:
Rebuilding of the existing bridge and rebuilding of portions of the roadway on either side of the bridge would be necessary to increase the SSD of this existing crest vertical curve. The cost of roadway is $1,500,000. The cost of structures is $9,750,000. The total added cost to make standard is estimated at $11,250,000. These additional costs represent 4.7 % of the total project's construction cost.

2.2. Design Exception Feature #2 – Alignment Consistency

Nonstandard Features (refer to Attachments 7, 9 & 10):
A 3,129 foot tangent along the existing "A3" Line ends with a 2,012 foot radius curve at BC station 871+04.70. The horizontal curve's design speed is 69 mph; while the previous curve's design speed is 80mph .

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 203.3 - Alignment Consistency
"Where physical restrictions on curve radius cannot be overcome and it becomes necessary to introduce curvature of lower standard than the design speed for the project, the design speed between successive curves should change not more than 10 miles per hour. Introduction of curves with lower design speeds should be avoided at the end of long tangents, steep downgrades, or at other locations where high approach speeds may be anticipated."

Reasons for Requesting Exception:
This standard attempts to keep consecutive curves within a 10 mph design speed of each other. The curve preceding this location has a design speed of 80 mph and this location, which is the southbound I-15 "A3" line, has a design speed of 69 mph, creating a difference of 11 mph instead of the standard 10 mph. The second curve, with the 69 mph design speed, is an existing roadway that we are utilizing in this alternative to save on environmental impacts and, as mentioned above, one of the main benefits of Alt 3A was to utilize as much of the existing pavement and structures as possible. For this alternative there is no possible way to increase the radius of this alignment without substantial cost increases. One of the possible solutions would be to go to the preceding curve and design it to a 79 mph design speed. However, that too would require a design exception. Also, changing the previous curve would provide negligible help because the speed would still naturally increase due to the long downgrade between the curves. The existing second curve has accident data which indicates that it has a lower than statewide accident rate for this curve. Therefore, we do not believe that keeping this curve will have an adverse effect on the safety and operation of the roadway.

Added Cost to Make Standard:
To bring the curve up to standard would require revising the stretch of roadway and two bridges through out the length of curve. The added cost to make standard is estimated at $17,000,000. These additional costs represent 7.0 % of the total project's construction cost.

2.3. Design Exception Feature #3 – Coordination of Horizontal and Vertical Alignment

Nonstandard Features (refer to Attachments 8, 9 & 20):
The horizontal curve along the existing "C2" Line between station 856+42.14 and station 872+73.31 has a radius of 650 feet, which correlates to a design speed of 43 mph. There is a 400 foot vertical curve between station

862+03.70 and station 866+03.70. The vertical curve's design speed is greater than 80 mph. The horizontal curve should have a design speed of a least 80 mph

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 204.6 - Coordination of Horizontal and Vertical Alignment
"On highways in mountainous or rolling terrain where horizontal and vertical curves are superimposed at a grade summit or sag, the design speed of the horizontal curve should be at least equal to that of the crest or sag, and not more than 10 miles per hour less than the measured or estimated running (85th percentile) speed of vehicles on the approach roadway."

(Note: The "85th percentile" rule is used by traffic engineers to establish speed limits. The speed limit should be set to the speed that separates the bottom 85% of vehicle speeds from the top 15%)

Reasons for Requesting Exception:
This particular feature along the "C2" line is an existing roadway for the horizontal and vertical alignment. The project is widening this connector to provide a second lane for passing opportunities; however, the horizontal and vertical alignments are being retained in an effort to minimize impacts to right of way and environmental areas adjacent to the freeway. This particular alignment introduces a 400 foot sag vertical curve midway through a horizontal curve with design speed greater than 80 mph. Reconfiguration of the horizontal curve to obtain a higher design speed is not feasible considering the existing constraints of roadways and bridges. Accident data for this connector (PM, 17.489) is available in Table 4, although the actual (F+I) rate of 0.29 is slightly higher then the average (F+I) rate of 0.26, the actual total accident rate compared to an average total rate is lower for this section of the roadway. The existing accident rate is below the average and we expect the improvement we will be constructing here will not have an adverse affect on the accident rate. As mentioned in the Mandatory Design Feature # 3 - Stopping Sight Distance, A cut slope on the left side of the connector had restricted SSD to 43 mph. However, a retaining wall is proposed to be placed at 24 feet from the edge of the shoulder which will meet the standard SSD. The single column obstruction, the stopping sight distance (SSD) will never meet the standard for 50 mph design speed and taillight will not be visible at this particular spot due to the bridge column.

Added Cost to Make Standard:
The cost to make standard includes realignment under existing roads, new pavement and new structures. The structures that will need to be replaced included Cajon Creek Bridge Lt, Center Connector Bridge, West Connector Bridge, and widening on Devore Overhead Left. The added cost to make standard is estimated at $29,400,000. These additional costs represent 12.2 % of the total project's construction cost.

2.4. Design Exception Feature #4 – Median Width

Nonstandard Features (refer to Attachments 3, 4, 5, 8 & 14):

At location 1, the median along the existing I-15 "A1" Line transitions from a width of 36' to a width of 22' beginning from station 791+00 to 801+40. This transition is roughly equivalent to a taper rate of 58:1. However, it is not noticeable since it occurs through a curve along the main line. The median continues at a 22' width from station 801+40 to station 826+49.86 and then transitions to the required 36' and wider median at station 830+60.

At location 2, the median along the existing I-215 "B1" Line transitions from a width of 36' to a width of 22' beginning from Station 927+55 to about 936+90. Then the median transitions back to the required 36' width (and wider) at Station 940+45.

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 305.1, (1)(a) - Median Width
"Minimum median widths for the design year should be used in order to accommodate the ultimate highway facility (type and number of lanes):"
"the minimum median width for freeways and expressways in urban areas should be 36 feet."

Reasons for Requesting Exception:
Location 1 – Along I-15 alignment (3, 4 & 5)
In this particular location the median is 22 feet wide, whereas, it should be 36 feet wide. This project is constructing four additional lanes within the existing dirt median to avoid outside widening of the freeway within this area, which is from Glen Helen Parkway to the railroad overhead. If the freeway median were maintained and all widening happened on the outside, embankments and cut sides would need to be widened for the four extra lanes. To accomplish this additional right of way would be required consisting of private uses and county park properties. Park land is a 4f resource we have, to this point, been able to avoid. A follow-up project proposes to add high capacity lanes in the median of an unknown width. If standard median standards apply to that project also, additional right of way will again be needed from the park. So is to avoid additional environmental impacts in these areas. It is proposed as an interim measure to use the median until the follow-up project selects a x-section and a know need is of right of way can be required once. The northbound I-15 accident rate is currently 1.31 compared to an average of 0.79. This is higher than the average and is considered to be a result of the bottleneck condition at this location where we have four lanes narrowing down to only three lanes in the northbound direction. The construction of one additional mixed flow lane and one additional auxiliary lane between the interchanges at Glen Helen Parkway and I-215 are anticipated to provide additional capacity and relieve the congestion which is considered to be the contributing factor to the high accident rate. It is believed that the improvements proposed here will improve the operations and safety of this section of roadway. In the southbound direction this area has an accident rate very equivalent to the average. The existing accident rate is 0.72 which is slightly lower than the 0.79 statewide average. We don't believe that the southbound improvement will have an adverse effect on the operations or safety of the freeway in this area.

Location 2 – Along the I-215 alignment (8 & 14)
At this location the median is 22 feet wide, whereas it should be 36 feet wide. The construction of the interchange originally built the B2 and B3 alignment (NB and SB mainline) as the mainline freeway toward San Bernardino. The bridge at this location spans over the C2 connector and was designed to accommodate three lanes northbound and three lanes southbound with standard 10 foot shoulders on the outside and a 22 foot median in between the two roadways. This would provide for 10 foot shoulders and two feet for median barrier. This bridge was configured so it could be widened another 12' on the outside to make room for one more lane. In order to make the median width standard, the Center Connector Undercrossing Bridge (Bridge No. 54-782) will need to be widened by a minimum of 7 feet on each side. Although this can be accommodated under the current project, a follow-up project will need to widen another 12'-16' for an HOV lane or HOT lane connector ramp. The second reason is that there is another bridge (Separation Bridge) above the B2 and B3 alignment which is the A2 or northbound I-15 freeway. This bridge spans over 6 lanes and can accommodate 8 lanes with a 22' median, however it can not accommodate 6 MF lanes + 2 HOV lanes with buffer AND a 36' median. It is possible to widen the B2 and B3 alignment to obtain a standard median however the cost of widening each side of the existing bridge by 7' will provide minimal operational or safety improvements over the proposed condition. When the HOV/HOT lanes are constructed another sliver bridge widening would be needed or even a replacement of the 7' widening constructed under this job making this improvement a throw-away. The reasons for this design exception is to avoid expenditure of funds which will not provide any useful benefit, not accommodate future work and possibly be throw away work. Accident data in this area is mixed with some rates above and some below the state wide average. The higher rates appear to be more associated with a SB lane drop and the NB

215/15 merge as opposed to the median width (which is currently non standard). Project features to eliminate the SB lane drop, and to provide a NB truck bypass will most likely improve the accident rates.

Added Cost to Make Standard:
Location 1, The cost to make standard is estimated at $2.8 million which include the cost of widening the bridge of about 7 feet on each side, roadway and earth work at this location. These additional costs represent 1.1 % of the total project's construction cost.

Location 2, The cost to make standard is estimated at $1.5 million which include a bridge widening, a retaining wall on the I-215 SB, and widened roadways at the bridge approaches. The required widening of the bridge would be about 4' on each side of the freeway. However, this sliver widening would not be structurally feasible since a second widening would be needed for the ultimate lane configuration (1 HOV + 3 lanes). Therefore, the cost will be based on the ultimate bridge widening. These additional costs represent 0.6 % of the total project's construction cost.

2.5. Design Exception Feature #5 – Side Slopes

Nonstandard Features (refer to Attachments 16 & 17):
At location 1, the embankment slope along SB "A4" Line, between station 27+80 and station 73+00, is 2:1 beyond the Clear Recovery Zone (CRZ) limits, with benches at 50 ft intervals of vertical elevation. The standard required slope is 4:1 or flatter.

At location 2, the embankment slope along the SB Kenwood exit ramp "K3" Line, between station 10+40 and station 29+00, is 2:1 beyond the CRZ limits, with benches at 50 ft intervals of vertical elevation. The standard required slope is 4:1 or flatter.

At location 3, the embankment slope along NB "A2" Line, between station 828+50 and station 838+92, is 2:1 beyond the CRZ limits. The standard required slope is 4:1 or flatter.

At Location 4, the embankment slope along NB "A2" Line, between station 841+15 and station 847+55, is 2:1 beyond the CRZ limits, with a bench at 50 ft of vertical elevation. The standard required slope is 4:1 or flatter.

At location 5, the embankment slope along NB "CD" Line, between station 935+30 and station 926+05, is 2:1 beyond the CRZ limits, with a bench at 50 ft of vertical elevation. The standard required slope is 4:1 or flatter.

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 304.1(a)
"For new construction, widening, or where slopes are otherwise being modified, embankment (fill) slopes should be 4:1 or flatter."

Reasons for Requesting Exception:
This feature identifies any side slopes steeper than 4:1 as non standard. In this area, the surrounding terrain in extremely mountainous and construction of 4:1 slopes for the entire length of embankment fills would have a very large impact to the surrounding land. If the standard of the 4:1 slopes were used for the design: Locations 1,2 & 3 slope would extend 100 feet to 150feet farther, and would encroach on SBKR habitat. Location 3 would also require more property takes; Location 4 would extend 250 feet to 300 feet farther out and would encroach onto the old Cajon Blvd and possibly the Arroyo Toad habitat; Location 5 would extend up to 550 feet further out. This is due to the large vertical embankment that the 4:1 slope would need to chase about 70 feet more downward. In discussion with district and headquarters personnel, an alternative cross section was proposed that would

minimize the right of way and environmental impacts affected by 4:1 slopes, yet still meeting the desired benefit of a clear recovery zone adjacent to the freeway mainline. The alternative cross section provides for a 30 foot clear recovery zone with 10:1 slope prior to any slope rounding at the hinge point. The slope rounding would be 10 feet then transition to a 2:1 side slope with benching every 50 foot of vertical. The benching, which currently does not exist in the fill slopes in Cajon Pass, is to minimize erosion effects of rainwater going down these side slopes. These benches would reduce the overall water and erosion potential for these fill slopes. The net result of this cross section is a much reduced footprint for right of way acquisition and impacts to the environmentally sensitive areas at the toe of these slopes. At the northerly limits of these slopes would be very close to Arroyo Toad habitat and the middle portion of the project the slopes extend into the Cajon Creek bed area which is SBKR habitat and also waters of the U.S. By doing this there is a substantial minimization to the effects to environmental resources in this area.

The selected x-section for these areas have the following benefits:

- MBGR adjacent to the edge of shoulder is not needed (as the current freeway has)
- A distance greater than the needed CRZ is provided
- A portion of this 30' could be used as a Bio-Swale to help with storm-water cleanup
- The slope rounding will help the overall aesthetic view of the freeway
- Benching will help minimize embankment erosion
- Benching will provide maintenance access to the side slopes

Added Cost to Make Standard:
The cost to make the slopes standard will be cost excessive with both increased earthwork and increased r/w. The cost of earthwork is $12,750,000. The cost of R/W is $38,500,000. The added cost to make standard is estimated at $51,250,000. These additional costs represent 21.2 % of the total project's construction cost.

2.6. Design Exception Feature #6 - Guidelines for the Location and Design of Curb Ramps

Nonstandard Features (refer to Attachment 13):
Curb returns at the north intersection of Devore Road and "D1" and "D2" Lines have only one curb ramp per corner. Two ramps at each corner are required.

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 105.4 (2) - Location Guidelines
"On new construction, two ramps should be installed at each corner as shown on the Standard Plans."

Reasons for Requesting Exception:
This design standard identifies that the curb return there should have two curb ramps constructed. This standard does not take into consideration whether there are one or two crosswalks approaching this curb ramp. At I-215 northbound ramps and Devore Road, only a single crosswalk is proposed at a curb return which parallels Devore Rd, thus only requiring a single curb ramp.

The intersection for the northbound off ramp to Devore Road is a diamond type configuration (with an off ramp and an on ramp intersecting a two lane local street). The proposed location will have curb and gutter and sidewalk because the adjacent developments of two gas stations have curb, gutter and sidewalk already constructed along their frontage. The crosswalks will be in the north / south direction along Devore Road and there were no proposed crosswalks in the east / west direction for all curb returns, a single curb ramp is being proposed.

Added Cost to Make Standard:
The cost to make each corner standard includes adding a second curb ramp with detectable warning surface at each corner. The added cost to make standard is estimated at $0. These additional costs represent 0.0 % of the total project's construction cost.

2.7. Design Exception Feature #7 - Ramps - Location and Design of Ramp Intersections on the Crossroads (4% grade)

Nonstandard Features (refer to Attachments 11, 12, 13, 19 & 21):
At location 1, the intersection of Devore Road and ramp terminal "D1" and "D2" Lines has a vertical grade of 7.05 percent. 4 percent or less is required.

At location 2, The intersection of Kenwood Avenue and ramp terminal "K1" and "K2" Lines is within a 200' Vertical Curve (VC) with G1=10.14 percent and G2=8.27 percent. 4 percent grade or less is required.

At location 3, the intersection of Kenwood Avenue and ramp terminal "K3" and "K4" Lines has a vertical grade of 10.1 percent. 4 percent or less is required.

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 504.3 (3) - Location and Design of Ramp Intersections on the Crossroad.
"Ramp terminals should connect where the grade of the overcrossing is 4 percent or less to avoid potential overturning of trucks."

Reasons for Requesting Exception:
There are three locations where this design feature is not achieved, the northbound Devore Road ramp termini, the northbound Kenwood Avenue ramp termini and the southbound Kenwood ramp termini. These intersections all tie into existing streets with profile grades in the 7 – 10 percent range. Reconstruction of these streets to achieve a 4 percent gradient through the intersection is not practicable because of adjacent development and also because the existing roadways continue on this sustained grade for some distance. It would be extremely difficult to get back to the existing profile without substantially exceeding the existing gradient of these two roadways. Gradients in excess of 10 percent would be necessary for the length of the reconstruction would be excessively long, so it is proposed to not attempt the 4 percent grade at these three locations. The 3 intersections in question have existed since the freeways were constructed in the 50's and 60's. Truck traffic is not expected to use the Kenwood interchange to any degree that would impair the operational characteristics of the intersections. Truck traffic may continue to use the Devore ramps to access the FEDEX facility however the slope of Devore Rd is not ADVERSE to the left turning trucks that are expected to use this particular intersection. In this particular instance the slope of Devore Road may help the left turning truck traffic.

Added Cost to Make Standard:
The cost to make the grades standard will be cost excessive. As discussed above, improving Kenwood would technically not be feasible to flatten out the existing 10% grade to 4% and then try to make the existing grade farther north. The Devore ramp termini would be similar. In order for Devore to be standard, the adjusted Devore grade would not make the gas stations and store not accessible. The cost for Devore would be about $5,000,000. These additional costs represent 2.1 % of the total project's construction cost.

2.8. Design Exception Feature #8 - Ramps - Location and Design of Ramp Intersections on the Crossroads (Corner Sight Distance)

Nonstandard Features (refer to Attachment 12):
The "K1" Line exit ramp ends at Kenwood Avenue. The left corner sight distance is limited by the combination of the embankment slopes, curvature and downward slope of Kenwood Ave as well as the bridge columns of the "T1" Line undercrossing and the existing bridge columns of the NB I-15 undercrossing. The sight distance due to the bridge columns is 438 feet. The required distance should be 495 feet (45 mph x 7.5 sec).

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 504.3 (3) - Location and Design of Ramp Intersections on the Crossroad.
"For left-turn maneuvers from an off-ramp at an unsignalized intersection, the length of crossroads open to view should be greater than the product of the prevailing speed of vehicles on the crossroads, and the time required for a stopped vehicle on the ramp to execute a left-turn maneuver. This time is estimated to be 7½ seconds."

Reasons for Requesting Exception:
This is the northbound off ramp the K1 line at Kenwood Avenue. The 7.5 second criteria is not achievable looking to the left because the embankment slopes, bridge columns and the curvature of Kenwood Avenue. Kenwood Avenue will have -8.27% grade to the left of the NB Off Ramp. Vehicle traffic on Kenwood Avenue would be traveling up at 8.27% grade toward the I-15 NB Ramps. The proposed "T1" bridge columns are lined up with the existing NB I-15 Bridge columns and have a partial sight restriction of 438 feet. This proposed configuration for placement of the T-1 bridge columns does not make the existing situation worse. It is also anticipated that Kenwood Avenue will remain a 2-lane road keeping the current SSD in the future. In an attempt to maximize the sight distance, the off ramp intersects Kenwood Avenue at a 90 degree angle.

Added Cost to Make Standard:
The cost to make the sight distance standard will be cost excessive with the rebuilding of the NB I-15 Bridge. The added cost to make standard is estimated at $4,250,000. If temporary bridges will be necessary during the staging of this replacement, it may add another $2 million to the cost. These additional costs represent 1.8 % of the total project's construction cost.

2.9. Design Exception Feature #9– Freeway Entrances and Exits – Design Speed

Nonstandard Features (refer to Attachments 6):
The exit nose of "CD" Line is required to have a design speed of 50 mph or greater. However, the exit ramp is composed of a horizontal compound curve with a radius of 757' which correlates to a design speed of 47 mph.

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 504.2(4)(a) – Freeway Exit
"The design speed at the exit nose should be 50 miles per hour or greater for both ramps and branch connections."

Reasons for Requesting Exception:
This is the Devore off ramp which exits from the C1 connector (from NB I-15). The C1 line has an 850 feet radius. The CD line off-ramp has an 850 foot radius, compounds to a 757 feet radius immediately after the diverge which is 93 feet less than the required 850 foot radius. This is required to permit the merge with the D3 line. The design speed of this particular radius is 47 mph which slightly less than 50 mph. To achieve standard design, a considerable amount of additional bridge and roadway construction and right of way acquisition impacts on environmental habitat would be required. Making Line CD standard would require that the diverge from the I-

15, at both Line CD and Line C1, be relocated further south. This would require a widening of about 35 feet of the Cajon Creek Bridge and a widening of about 12 feet of the railroad bridge located further south. Additionally, this would extend out the right of way acquisition approximately 40 to 50 feet.

Added Cost to Make Standard:
The cost to make the Devore off ramp standard requires that the diverge with I-15 both Line CD and Line C1 be relocated further south. As a result, Line CD and C1 will need a separate bridge from the I-15 mainline Cajon Creek Br Rt. Additional right of way will also be taken. The added cost to make standard is estimated at $6,200,000. These additional costs represent 2.6 % of the total project's construction cost.

2.10. Design Exception Feature #10– Freeway-to-Freeway Connections – Design Speed

Nonstandard Features (refer to Attachments 8, 9, 14 & 15):
The horizontal existing curve along "C2" Line between station 856+42.14 and station 872+73.31 has a radius of 650 feet, which correlates to a design speed of 43 mph. The minimum standard design speed of 50 mph would then require a radius of 850 feet.

Standard for Which Exception is Requested:
Per Caltrans Highway Design Manual (HDM), 6th Edition, Index 504.4(2) – Design Speed
"The design speed for single lane directional and all branch connections should be minimum of 50 miles per hour. When smaller radius curves, with lower design speeds, are used the vertical sight distance should be consistent with approaching vehicle speeds".

Reasons for Requesting Exception:
The northbound I-215 to southbound I-15 connector, the C2 line, is an existing connector with a design speed of 43 mph. This connector is not being proposed for reconstruction because it is the lowest level of a three level interchange. Reconstructing this connector to achieve a 50mph design speed would require a complete reconstruction of the interchange. It would affect right of way and environmental area adjacent to the freeway. It is proposed to keep this alignment because it has a relatively small demand for traffic in the future and the existing connector has a low accident rate compared to the statewide average. The existing accident rate of 0.45 compared to the average of 0.80 is significantly lower. This connector will be widened to accommodate a second lane to allow for slow vehicles to be passed. The proposed improvement in this area is not expected to have an adverse effect of the accident rate. The improvements are expected to enhance the operation of the connector.

Added Cost to Make Standard:
The cost to make standard includes realignment under existing roads, new pavement and new structures. The structures that will need to be replaced included Cajon Creek Bridge Lt, Center Connector Bridge, West Connector Bridge, and widening on Devore Overhead Left. The added cost to make standard is estimated at $29,400,000. These additional costs represent 12.2 % of the total project's construction cost.

3. TRAFFIC DATA

A Traffic Operation Analysis was performed to study the existing traffic conditions (Year 2007), forecast future traffic demand (Year 2040) and assess the impact on traffic conditions of the proposed improvements. Detailed methodologies and analysis results can be referenced in the draft Traffic Operations Analysis report dated December 18, 2009.

The current and projected Average Daily Traffic volumes for this project are shown in Table 1:

Table 1: Existing and Forecasted ADT Volumes

Freeway Segment	ADT		
	2007	2017	2040
I-15 Northbound			
Sierra Ave On Ramp to Glen Helen Pkwy Off Ramp	55,500	81,200	140,400
Glen Helen Pkwy On Ramp to I-215 SB Connector	53,600	78,200	134,600
I-215 SB Connector	8,800	10,000	12,600
I-215 SB Connector to I-215 NB Connector	44,800	68,200	122,000
I-215 NB Connector to Kenwood Ave Off Ramp	66,100	103,000	188,000
Kenwood Ave On Ramp to North of Kenwood Ave	64,900	103,000	190,700
I-15 Southbound			
North of Kenwood Ave to Kenwood Ave On Ramp	70,400	106,000	187,900
Kenwood Ave On Ramp to I-215 SB Connector	71,600	107,800	191,100
I-215 SB Connector to I-215 NB Connector	50,400	73,200	125,600
I-215 NB Connector to Glen Helen Pkwy Off Ramp	59,200	82,600	136,400
Glen Helen Pkwy On Ramp to Sierra Ave Off Ramp	58,100	83,800	143,000
I-215 Northbound			
University Pkwy On Ramp to Palm Avenue	29,600	44,000	77,000
Palm Ave On Ramp to Devore Rd Off Ramp	28,400	43,400	78,000
I-15 SB Connector	8,800	9,400	10,800
I-15 NB Connector	21,300	34,800	65,900
I-215 Southbound			
Connector from I-15 SB	21,300	34,700	65,400
CD On Ramp to Palm Ave Off Ramp	31,400	46,200	80,400
Palm Ave On Ramp to University Pkwy Off Ramp	30,100	45,000	79,100

Table 2 shows the projected (Year 2040) AM and PM peak hour traffic volumes and percent of trucks for the I-15 freeway mainline between the adjacent interchanges and the ramps.

Table 2: Year 2040 I-15 Mainline and Ramp Peak Hours Volumes

Freeway Segment	2040			
	AM		PM	
	Volume vph	Trucks %	Volume vph	Trucks %
I-15 Northbound				
Sierra Ave On Ramp to Glen Helen Pkwy Off Ramp	5,898	12%	8,862	13%
Glen Helen Pkwy Off Ramp	194	7%	473	5%
Glen Helen Pkwy Off Ramp to Glen Helen Pkwy On Ramp	5,704	12%	8,392	14%
Glen Helen Pkwy On Ramp	104	1%	488	6%
Glen Helen Pkwy On Ramp to I-215 NB Connector	5,808	12%	8,880	13%
I-215 SB Connector	820	3%	793	7%
I-215 SB Connector to I-215 NB Connector	4,988	14%	8,086	14%
I-215 NB Connector	2,943	10%	5,490	5%
I-215 NB Connector to Kenwood Ave Off Ramp	7,931	12%	13,576	10%
Kenwood Ave Off Ramp	79	23%	309	7%
Kenwood Ave Off Ramp to Kenwood Ave On Ramp	7,851	12%	13,267	10%
Kenwood Ave On Ramp	20	30%	794	6%
Kenwood Ave On Ramp to North of Kenwood Ave	7,871	12%	14,061	10%
I-15 Southbound				
North of Kenwood Ave to Kenwood Ave On Ramp	14,452	9%	11,119	11%
Kenwood Ave Off Ramp	584	14%	11	27%
Kenwood Ave Off Ramp to Kenwood Ave On Ramp	13,869	8%	11,108	11%
Kenwood Ave On Ramp	210	6%	90	10%
Kenwood Ave On Ramp to I-215 SB Connector	14,079	8%	11,198	11%
I-215 SB Connector to I-215 NB Connector	8,385	12%	7,099	14%
I-215 NB Connector	657	9%	695	4%
I-215 NB Connector to Glen Helen Pkwy Off Ramp	9,042	11%	7,794	13%
Glen Helen Pkwy Off Ramp	152	14%	64	6%
Glen Helen Pkwy Off Ramp to Glen Helen Pkwy On Ramp	8,890	11%	7,730	13%
Glen Helen Pkwy On Ramp	535	7%	190	13%
Glen Helen Pkwy On Ramp to Sierra Ave Off Ramp	9,424	11%	7,920	13%

Table 3 shows the projected (Year 2040) AM and PM peak hour traffic volumes and percent of trucks for the I-215 freeway mainline between the adjacent interchanges and the ramps.

Table 3: Year 2040 I-215 Mainline and Ramp Peak Hours Volumes

Freeway Segment	2040			
	AM		PM	
	Volume vph	Trucks %	Volume vph	Trucks %
I-215 Northbound				
University Pkwy On Ramp to Palm Ave Off Ramp	3,711	9%	6,713	5%
Palm Ave Off Ramp	871	3%	1,143	1%
Palm Ave Off Ramp to Palm Ave On Ramp	2,840	11%	5,571	6%
Palm Ave On Ramp	453	3%	613	2%
Palm Ave On Ramp to Devore Rd Off Ramp	3,293	10%	6,184	5%
Palm Ave Off Ramp	150	5%	235	13%
Palm Ave Off Ramp to Devore Rd On Ramp	3,143	10%	5,949	5%
Palm Ave On Ramp	457	10%	236	3%
Palm Ave On Ramp to I-15 SB Connector	3,600	10%	6,185	5%
I-15 SB Connector	657	9%	695	4%
I-15 NB Connector	2,943	10%	5,490	5%
I-215 Southbound				
I-215 Connector from I-15 SB	5,694	4%	4,101	6%
CD Off Ramp	158	5%	85	6%
CD Off Ramp to CD On Ramp	5,536	3%	4,016	6%
CD On Ramp	935	5%	447	3%
CD On Ramp to Palm Ave Off Ramp	6,471	4%	4,462	6%
Palm Ave Off Ramp	784	2%	275	6%
Palm Ave Off Ramp to Palm Ave On Ramp	5,688	4%	4,187	6%
Palm Ave On Ramp	1,061	2%	963	2%
Palm Ave On Ramp to University Pkwy Off Ramp	6,749	4%	5,151	5%

4. ACCIDENT ANALYSIS

Traffic Accident Surveillance and Analysis System (TASAS) data was provided by Caltrans District 8, which includes accidents that occurred between October 01, 2005 and September 30, 2008 on the I-15 and I-215 freeway from PM12.5 to R19.5 and PM 14.00 to 17.75 respectively including the interchange ramp areas for a period of three years. Table 4 shows the accident rate at the adjacent interchanges and the mainline segment within the study area.

Table 4: TASAS – Accident Rate from 10/01/2005 to 09/30/2008

Location	Feature #	Alignment Line #	Actual *(Per MVM for mainline, per MV for ramp)*			Average *(Per MVM for mainline, per MV for ramp)*		
			Fatal	F + I	Total	Fatal	F + I	Total
Route 15 Mainline:								
Mainline, NB from PM 12.500 to 16.373	4-1,5-1, 5-3, 5-4	A1,A2	0.003	**0.43**	**1.31**	0.010	0.27	0.79
Mainline, SB from PM 12.500 to 16.373	1, 2, 4-1	A1, A3	0.003	0.19	0.72	0.010	0.27	0.79
Mainline, NB from PM R14.273 to R16.40		A2	**0.011**	**0.30**	**0.79**	0.008	0.23	0.65
Mainline, SB from PM R14.048 to R16.40	2	A3	**0.015**	**0.54**	**1.50**	0.008	0.23	0.65
Mainline, NB from R13.799 to R14.275 *		B2	**0.024**	0.27	0.51	0.011	0.29	0.84
Mainline, SB from R13.799 to R14.048 *	2, 3, 10	B3	0.000	0.28	0.69	0.014	0.35	1.00
Route 15 Ramps:								
NB Off to Glen Helen Pkwy, PM 14.565			0.000	**1.75**	**5.97**	0.007	0.37	1.20
SB On from Glen Helen Pkwy, PM 14.587			0.000	**0.96**	**0.96**	0.004	0.18	0.60
SB Off to Glen Helen Pkwy, PM 14.996			0.000	0.00	0.00	0.007	0.37	1.20
NB On from Glen Helen Pkwy, PM 15.008			0.000	0.00	**4.56**	0.004	0.18	0.60
NB Off to SB I-215, PM 16.137	9, 5-5	C1	0.000	0.00	0.00	0.003	0.10	0.30
SB Off to SB I-15, PM R14.048 **	2	A3	0.000	0.05	0.10	0.003	0.10	0.30
NB On from NB I-15, PM R14.273 **		A2	0.000	0.03	0.08	0.005	0.20	0.60
SB On from Kenwood Ave, PM R14.787	7-3	K4	0.000	**0.63**	**0.63**	0.004	0.18	0.60
NB Off to Kenwood Ave, PM R14.806	7-2, 8	K1	0.000	**0.67**	**1.34**	0.007	0.37	1.20
SB Off to Kenwood Ave, PM	5-2, 7-3	K3	0.000	**7.72**	**15.44**	0.007	0.37	1.20

Location	Feature #	Alignment Line #	Actual (Per MVM for mainline, per MV for ramp)			Average (Per MVM for mainline, per MV for ramp)		
			Fatal	F + I	Total	Fatal	F + I	Total
R15.200								
NB On from Kenwood Ave, PM R15.210	7-2	K2	0.000	0.00	0.00	.004	0.18	0.60
Route 215 Mainline:								
Mainline, NB from PM 14.00 to 17.753	4-2	B1, B2	0.000	0.17	0.66	0.010	0.29	0.90
Mainline, SB from PM 14.00 to 17.753	4-2	B1,B3	**0.028**	**0.50**	**0.99**	0.010	0.29	0.90
Route 215 Ramps:								
SEG SB On from Cajon Blvd, PM 17.075			0.000	**0.77**	**1.54**	0.004	0.23	0.70
NB Off to Devore Rd, PM 17.146	6, 7-1	D1	0.000	**0.68**	**1.37**	0.004	0.42	1.20
NB On from Devore Rd, PM 17.253	6, 7-1		**0.318**	**0.32**	**2.55**	0.008	0.16	0.55
NB Off to SB I-15, PM 17.489	3, 10	C2	0.000	**0.29**	0.49	0.007	0.26	0.80
SEG SB Off to Cajon Blvd, PM 17.654		D3	0.000	**1.19**	**5.95**	0.004	0.23	0.70

* TASAS identifies this as part of the I-15 'mainline', however it is actually a portion of the northbound and southbound I-215 connectors.

** TASAS identifies this as a 'ramp' to the freeway but actually it is the I-15 'mainline' northbound and southbound.

Note: **BOLD #** Indicate actual is higher than the statewide average.

TASAS-TSN data indicates that the accident actual total rate, when compared to the statewide average at the adjacent interchanges, at similar facilities, is higher at (9) nine locations along Route 15 and (5) five locations along Route 215. The PROJECT is expected to reduce congestion on Interstate 15 and 215 thereby reducing the accident rates in the area.

The accident rates for various sections of the state highways are above and below the statewide average for similar facilities. This discussion will look into the higher accident rates to identify the possible causes and corrective actions this project can implement to reduce these accident rates.

The northbound I-15 from PM 12.5 to 16.3 has accident rates higher than the statewide average. This is the location where the freeway narrows from 4 to 3 lanes and there is recurring congestion typically in the evenings. This project will add 1 to 2 lanes within this area to reduce congestion. A similar reduction in the accident rate is anticipated.

The northbound I-15 from PM R14.2 to R16.4 has accident rates higher than the statewide average. This is the location where the freeway merges with lanes from I-215. Northbound trucks from I-215 must weave across the I-15 lanes to reach the slow lanes. There is also a non standard weaving distance to the Kenwood off-ramp. It is believed that many of the accidents in this area are related to these weaving / merging maneuvers. This project will construct northbound truck bypass lanes in all of the alternatives, which will eliminate the truck weaving maneuver and the congestions related to it. The northbound Kenwood off-ramp will only be accessible from the truck bypass, thus eliminating the non standard weaving section. A similar reduction in the accident rate is anticipated.

The southbound I-15 from PM R14.0 to R16.4 has an accident rate higher than the statewide average. This is in the location where 2 auxiliary lanes are added prior to I-15 diverging from the mainline on the right side. There is also a non-standard weaving area between the SB Kenwood on-ramp and the I-215 diverge on the left creating a short weaving area for the number of lanes which need to be crossed to access the I-215 connector. It is believed that the substantial number of lane changes associated with I-15 traffic staying on I-15 is causing congestion in this area and contributes to the higher accident rates. Alternatives 2, 3 & 3A resolve the issue associated with I-15 diverging on the right side. In these three alternatives, route continuity is provided with the I-215 traffic diverging on the right and I-15 auto traffic staying in the left 3 lanes. The SB Kenwood on-ramp cannot access I-215 in these configurations also eliminating the non standard weave. In alternative 5, the basic configuration of the I-15 diverging on the right is maintained and so is the Kenwood on-ramp and the short weaving section. Alternative 5 does provide a SB truck bypass to I-215 which will remove the SB trucks from the weaving area. The length of the auxiliary lanes is made standard providing a longer distance for vehicles to make the needed lane changes prior to the truck bypass and the I-215 connector. These designs are anticipated to reduce the accident rate in this area.

The northbound off and on-ramps at Glen Helen Parkway have higher accident rates than similar facilities statewide. It is believed that this has the same cause as does the I-15 mainline in this area where the #4 lane northbound is forced off at Glen Helen Parkway.

The northbound off-ramp at Kenwood Ave has a slightly higher accident rate than similar facilities statewide. It is believed that this has the same cause as does the I-15 mainline in this area where there is a congested weaving area. The reconfiguration of the off-ramp from the truck bypass lanes is expected to reduce the accident rate for the ramp.

The southbound Kenwood off-ramp has an accident rate higher than the statewide average. This high rate (15.44 vs. 1.2) can be attributed to only a few accidents on a relatively low volume ramp. These accidents mostly involve trucks descending Cajon Pass and experiencing what appear to be related to brake failure, or the inability to stop at the ramp termini.

The SB I-215 mainline has an accident rate slightly higher than the average. Improvements in this area will add a 3rd lane and a wider left shoulder. These improvements should improve the situation.

The SB I-215 collector–distributor road (PM 17.075 and 17.654) has accident rates higher than the statewide average for a similar facility. This collector-distributor road has a very short weaving section where traffic from the NB 15 connector cross SB I-215 traffic headed to the Devore Rd off-ramp. This off-ramp also has a tight radius 'hook' configuration. The southerly end of this weaving section also has a crest vertical curve with limited sight distance. These 3 factors contribute to the high accident rate in Alternatives 2, 3 & 3A the weaving section is eliminated by use of various braiding configurations. In Alternative 5 a weaving section is provided along the Truck bypass which is about 5 times longer than the existing weaving area. In all alternatives hook ramps are

moved further south, a larger radius is provided and a longer deceleration distance provided prior to the first curve. All of these proposed designs are expected to reduce the accident rate along this section of freeway.

The northbound I-215 off and on-ramps at Devore Rd have accident rates higher than the statewide average. The non-standard geometric configuration of the ramps may be contributing factors to this. The on-ramp has a compound curve ending in a very tight loop merge with high speed auxiliary lanes and weaving area immediately prior to the connector to SB I-15. All alternatives eliminate the loop on-ramp to NB I-215 as well as the short auxiliary lane. Alternatives 2 and 5 provide standard hook on-ramps further south. Alternative 3 and 3A provide direct ramp to NB I-215.

5. INCREMENTAL IMPROVEMENTS

The designs proposed already incorporate as much of incremental improvements as possible. There are no additional incremental improvements possible without providing the full standards as outlines in each feature.

6. FUTURE CONSTRUCTION

This project is compatible with the proposed I-15 ultimate facility currently under study by SANBAG and Caltrans. The Route Concept Fact Sheet dated 1999, only addresses ultimate facility as being an 8+2 freeway. The I-15 Corridor Feasibility Study has three conceptual elements for the ultimate facility. When finally approved, these features will be incorporated into the new Route Concept Report currently being updated by Caltrans. The three elements being considered are:

- Add two HOV lanes (traditional widening adjacent to #1 lane)
- Construct 'Managed' lanes (similar to the reversible lanes in San Diego on I-15)
- Construct barrier separated "Truck Only" Lanes.

The managed lane concept could be 2, 3 or 4 lanes wide with or without a movable barrier to reconfigure the number of lanes in the heavier direction of travel. Reversible use of these lanes would favor the heaviest demand direction. The HOV and Managed lanes can be accommodated in the median of the south leg of I-15. The truck lane concept takes up the most width which would require outside widening of the south leg of I-15. The north leg of I-15 presents a challenge to this project because it is unknown which alternative will be selected for the corridor. The northbound and southbound roadbeds are on independent profiles and are separated vertically by up to15 feet. Addition of any lanes in the median will require extensive use of retaining walls for several miles.

An optional configuration on this leg would be to construct a 3rd roadbed on an independent profile further up the side of the hill, easterly of the northbound lanes. This new roadbed could be used for either the northbound mainline or the new 'managed' or 'truck' lanes. The existing northbound roadbed might be used for the managed/truck lanes if the northbound auto traffic uses the new roadbed. Close coordination with the corridor project will be needed as final design approaches.

The I-215 corridor also needs to be considered in these designs as it has not been built to its ultimate width which is 8 MF lanes + 2 HOV lanes. The August 1999 Route Concept Fact sheet identified the need for two HOV lanes on this section of I-215 just to meet the 2015 traffic demand. A revised Route Concept Report is being prepared by Caltrans at this time. The ultimate facility for I-215 will be considered in the development of this project.

7. PROJECT REVIEWS, CONCURRENCE

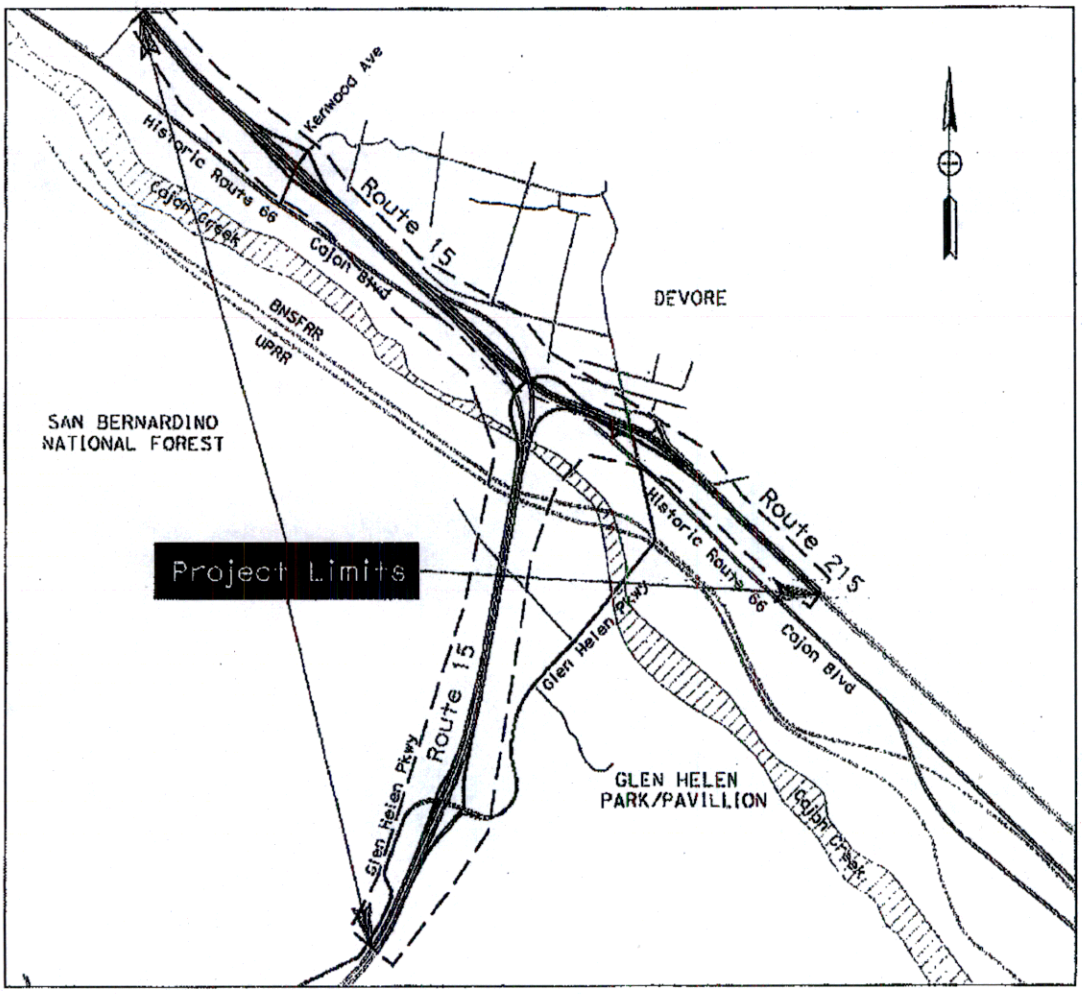
The exception has been reviewed during the Geometric Approval Drawing phase by the following individuals:

1. Anthony Ng, P.E., Design Oversight Office Chief (concurred 7/1/10,
2. Brian Frazer, P.E., Headquarters Design Reviewer (concurred 6/30/10,
3. Gideon Agra, P.E., Design Oversight Engineer (concurred 7/1/10
4. Theresa Sasis, P.E., Traffic Operations Reviewer (concurred 7/1/10

8. ATTACHMENTS

Attachment	**1**	-	**Location Map**	
Attachment	**2**	-	**Key Map**	
Attachment	**3**	-	**Design Exception Feature # 4**	**- (Sheet 7)**
Attachment	**4**	-	**Design Exception Feature # 4**	**- (Sheet 8)**
Attachment	**5**	-	**Design Exception Feature # 4**	**- (Sheet 9)**
Attachment	**6**	-	**Design Exception Feature # 9**	**- (Sheet 11)**
Attachment	**7**	-	**Design Exception Feature # 1 & 2**	**- (Sheet 12)**
Attachment	**8**	-	**Design Exception Feature # 3, 4,& 10**	**- (Sheet 13)**
Attachment	**9**	-	**Design Exception Feature # 2, 3 & 10**	**- (Sheet 14)**
Attachment	**10**	-	**Design Exception Feature # 2**	**- (Sheet 15)**
Attachment	**11**	-	**Design Exception Feature # 7**	**- (Sheet 23)**
Attachment	**12**	-	**Design Exception Feature # 7 & 8**	**- (Sheet 24)**
Attachment	**13**	-	**Design Exception Feature # 6 & 7**	**- (Sheet 38)**
Attachment	**14**	-	**Design Exception Feature # 4 & 10**	**- (Sheet 40)**
Attachment	**15**	-	**Design Exception Feature # 10**	**- (Sheet 41)**
Attachment	**16**	-	**Design Exception Feature # 5**	**- (Sheet SS-1)**
Attachment	**17**	-	**Design Exception Feature # 5**	**- (Sheet SS-2)**
Attachment	**18**	-	**Design Exception Feature # 1**	**- (Sheet P-1)**
Attachment	**19**	-	**Design Exception Feature # 7**	**- (Sheet P-2)**
Attachment	**20**	-	**Design Exception Feature # 3**	**- (Sheet P-3)**
Attachment	**21**	-	**Design Exception Feature # 7**	**- (Sheet P-4)**

Attachment 1
Location Map



Dist	County	Route	Post Miles Total Project	Sheet No.	Total Sheets
08	SBd	15, 215	13.5/16.0, 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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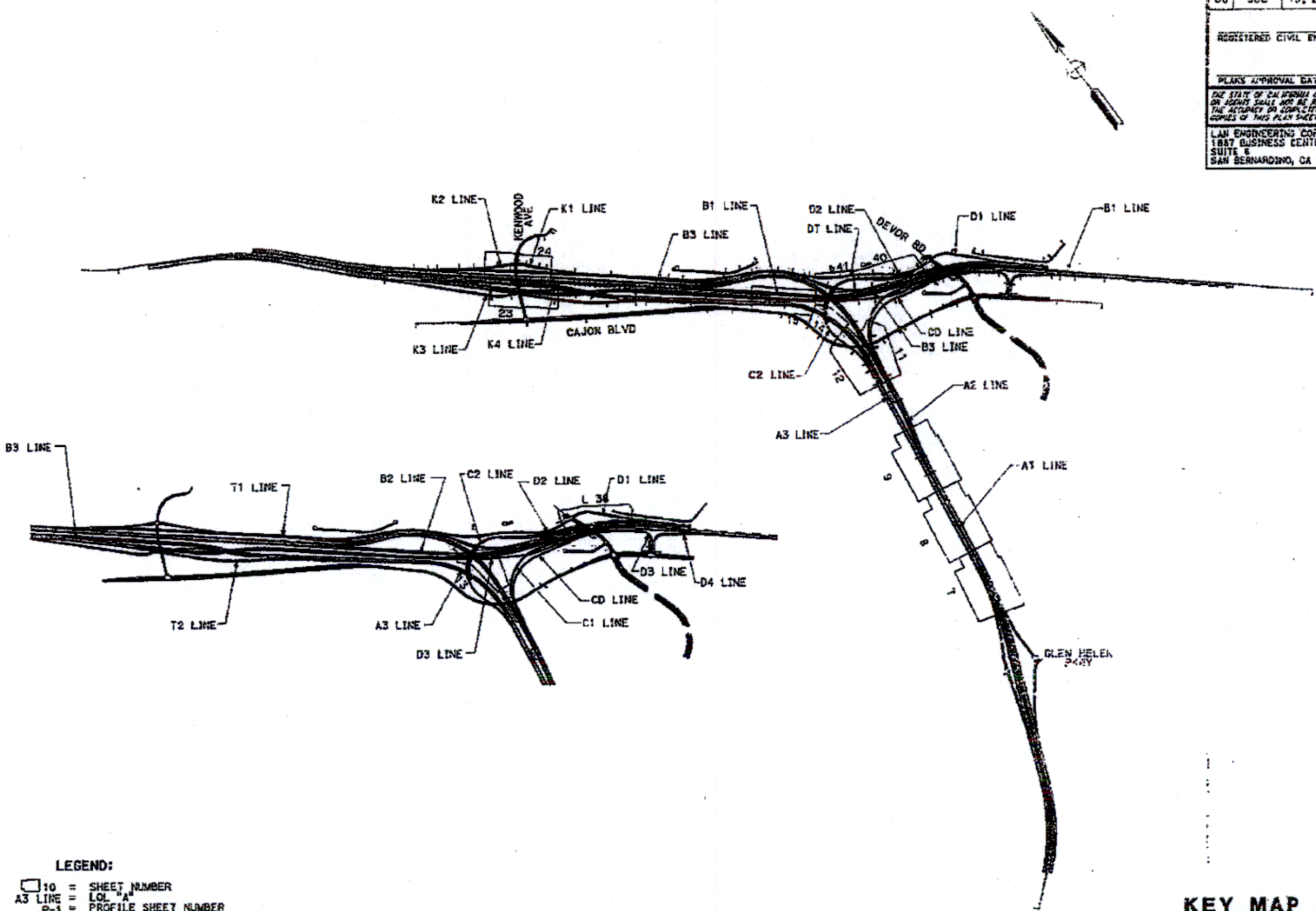

LEGEND:

- ☐10 = SHEET NUMBER
- A3 LINE = LOL "A"
- P-1 = PROFILE SHEET NUMBER
- IC = INTERCHANGE SPACING SHEET

KEY MAP
ADVISORY
DESIGN EXCEPTION
ATTACHMENT 2

NO SCALE

STATE OF CALIFORNIA – DEPARTMENT OF TRANSPORTATION | CONSULTANT FUNCTIONAL SUPERVISOR | CALCULATED-DESIGNED BY | CHECKED BY | REVISED BY | DATE REVISED

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USERNAME => LAN Engineering

CU 00000 | EA 000000

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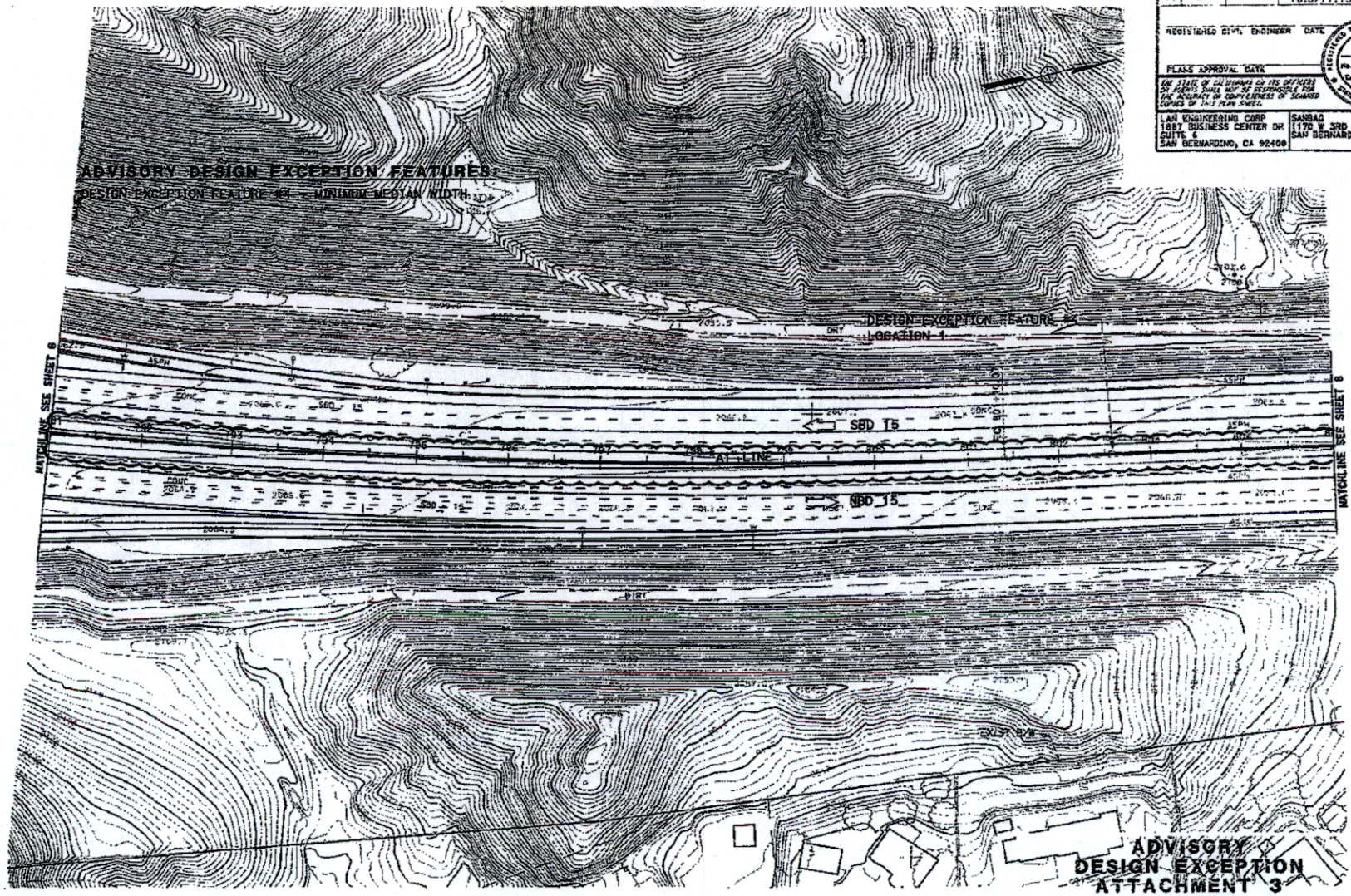

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.5/17.73		

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EA 000000

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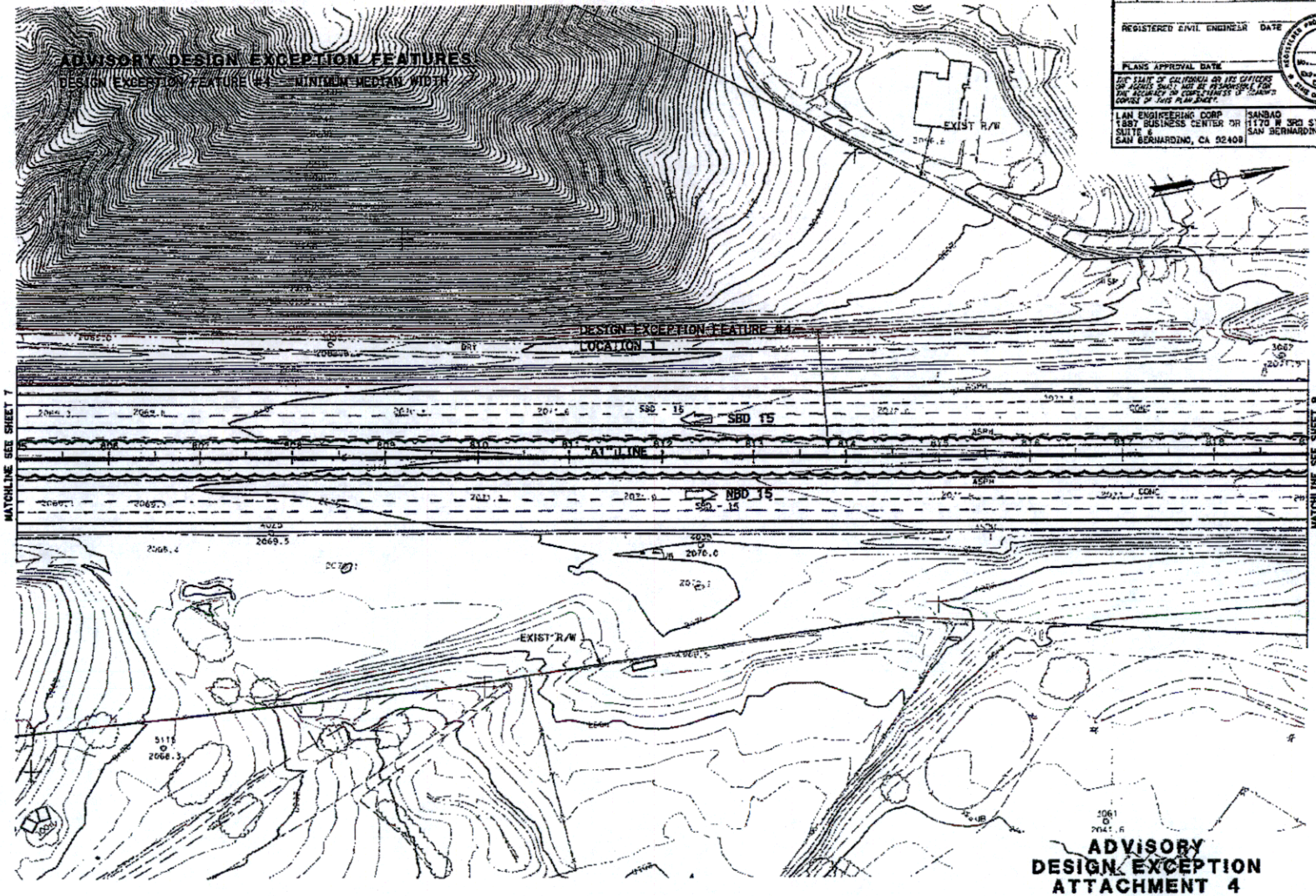

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 /6.0/17.75		

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ADVISORY DESIGN EXCEPTION ATTACHMENT 4

SCALE: 1"=100'

SHEET 8

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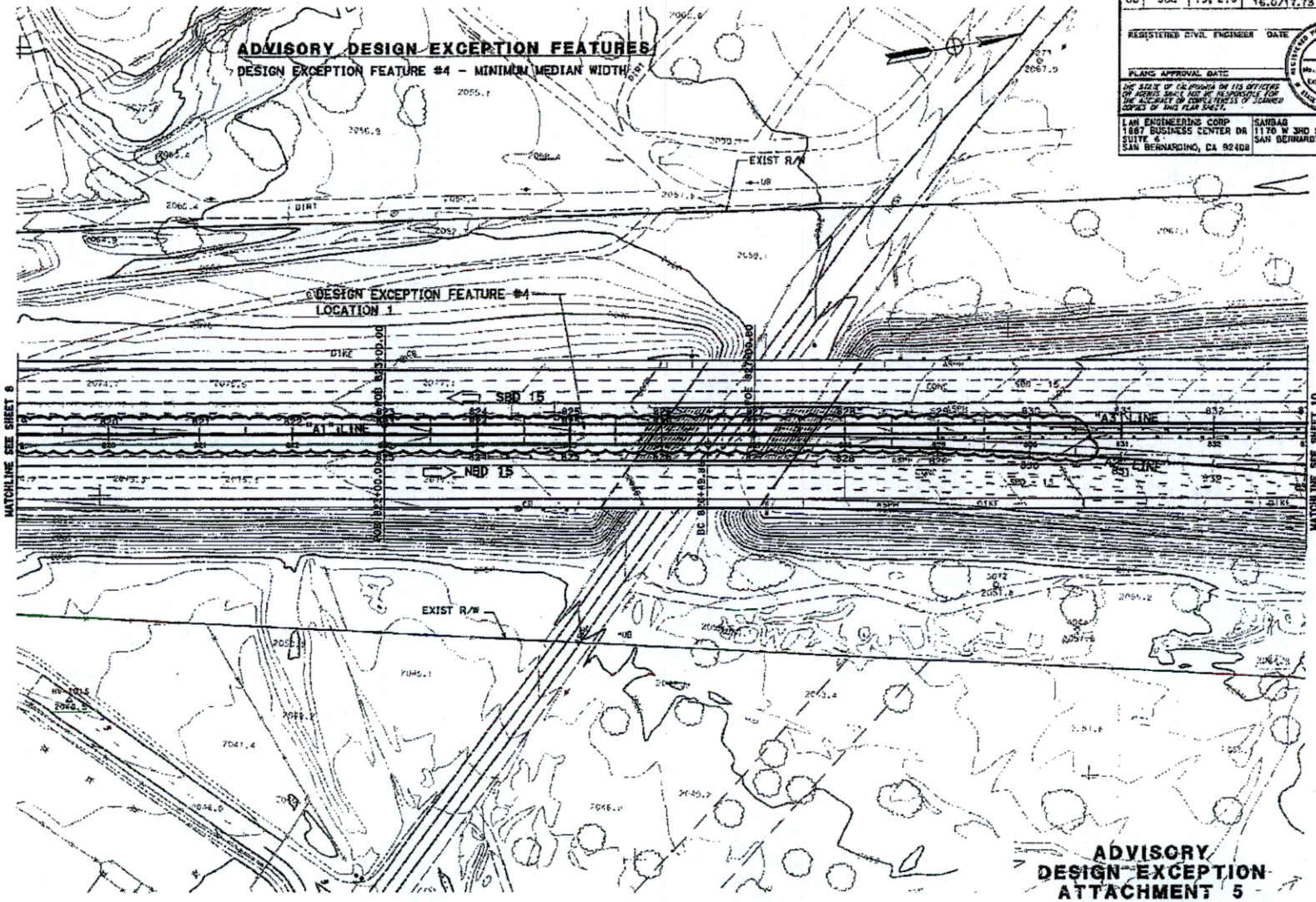

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CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA – DEPARTMENT OF TRANSPORTATION

Caltrans

ADVISORY DESIGN EXCEPTION ATTACHMENT 5

SCALE: 1"=100'

SHEET 9

DATE PLOTTED = 5/24/2010
TIME PLOTTED = 10:10:12 AM

00-00-00

BORDER LAST REVISED 04/13/2005

RELATIVE BORDER SCALE 0 1 2 3

USERNAME => LAN Engineering

CU 00000 EA 000000

ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #9 – FREEWAY EXIT DESIGN SPEED (50 mph)

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

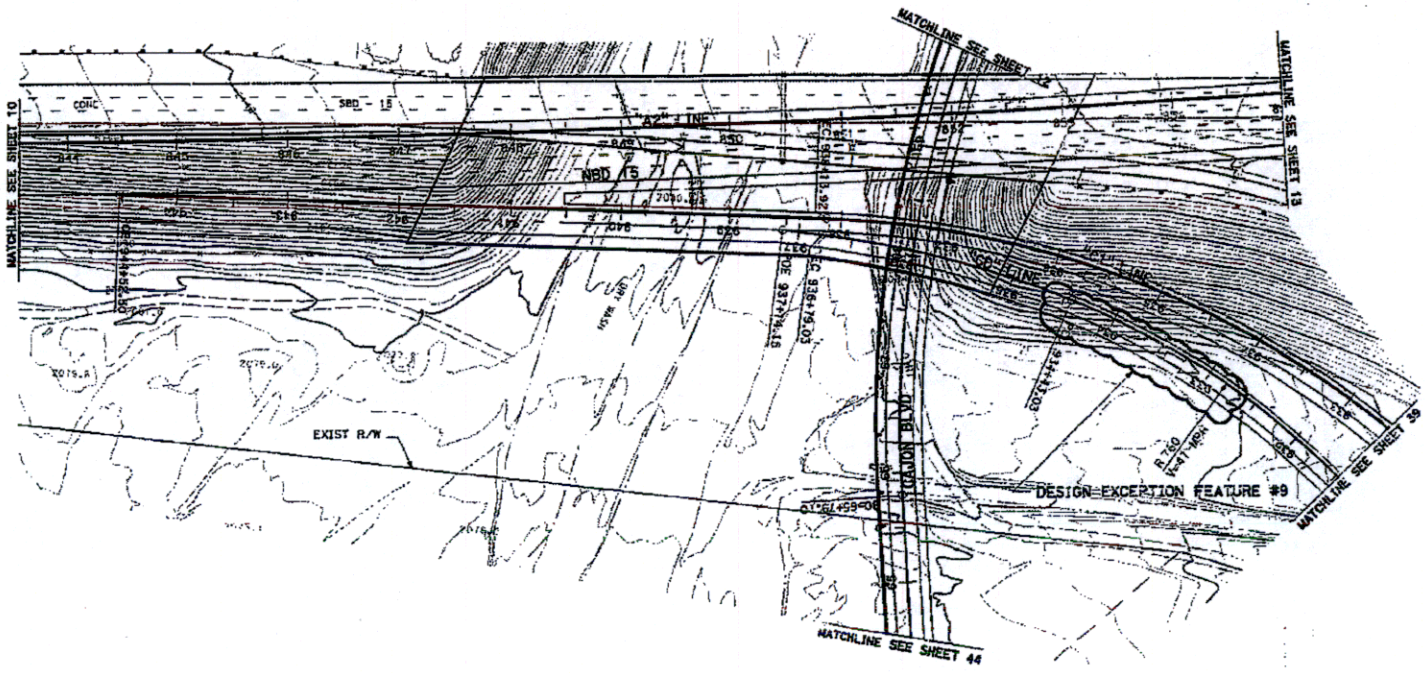
PLANS APPROVAL DATE

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

REGISTERED PROFESSIONAL ENGINEER — CIVIL — STATE OF CALIFORNIA

LAN ENGINEERING CORP
1867 BUSINESS CENTER DR
SUITE 6
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410



ADVISORY
DESIGN EXCEPTION
ATTACHMENT 6

SCALE: 1"=100'

SHEET 11

STATE OF CALIFORNIA – DEPARTMENT OF TRANSPORTATION

CONSULTANT FUNCTIONAL SUPERVISOR

CALCULATED-DESIGNED BY

CHECKED BY

REVISED BY

DATE REVISED

BORDER LAST REVISED 9/11/2008

RELATIVE BORDER SCALE 0 1 2 3

USERNAME = LAN Engineering

DATE PLOTTED = 11/04/2010

TIME PLOTTED = 10:57:22 AM

CU 00000

EA 000000

ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #1 - VERTICAL STOPPING SIGHT DISTANCE INCREASED 20% ON SUSTAINED DOWNGRADES

DESIGN EXCEPTION FEATURE #2 - CURVE AT END OF LONG TANGENT EXCEEDS DESIGN SPEED OF PREVIOUS

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.9 16.0/17.75		

REGISTERED CIVIL ENGINEER DATE

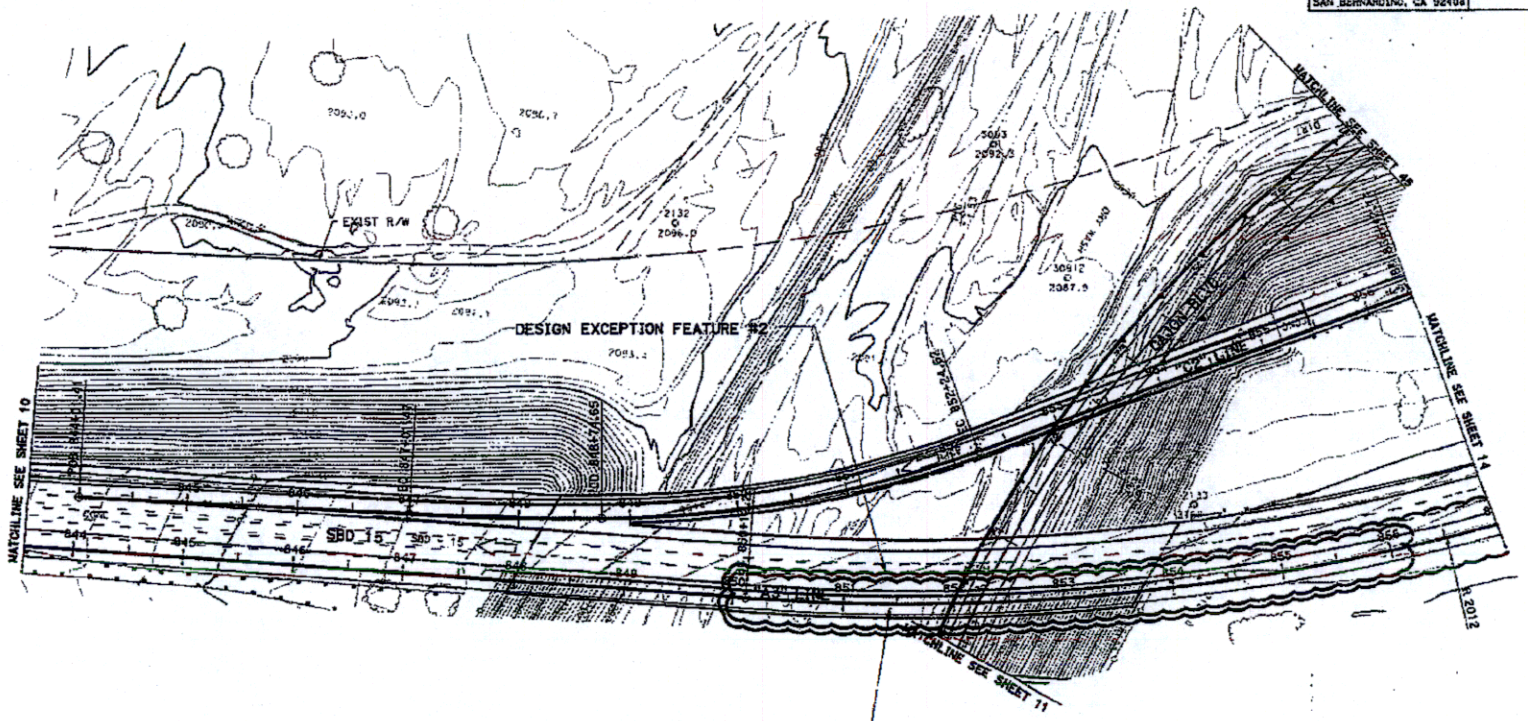
PLANS APPROVAL DATE

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

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

LAN ENGINEERING CORP
1687 BUSINESS CENTER DR
SUITE 6
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410



DESIGN EXCEPTION FEATURE #1
(SEE SHEET P-1)

ADVISORY DESIGN EXCEPTION ATTACHMENT 7

SCALE: 1"=100'

SHEET 12

REVISED BY | DATE REVISED | CALCULATED-DESIGNED BY | CHECKED BY | CONSULTANT FUNCTIONAL SUPERVISOR | STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

LAST REVISED 00-00-00 | DATE PLOTTED => 5/24/2010 | TIME PLOTTED => 11:03:06 AM

BORDER LAST REVISED 4/11/2008 | RELATIVE BORDER SCALE 0 1 2 3 | USERNAME => LAN Engineering | CU 00000 | EA 000000

ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #3 - HORIZONTAL AND VERTICAL CURVE ALIGNMENT CONSISTENCY
DESIGN EXCEPTION FEATURE #4 - MINIMUM MEDIAN WIDTH
DESIGN EXCEPTION FEATURE #10 - FREEWAY CONNECTOR DESIGN SPEED (50 mph)

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.6/16.0 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR CURE LIKELIHOOD OF ERRORS OF OMISSIONS OF THESE PLANS SHEET.

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

LAN ENGINEERING CORP
1687 BUSINESS CENTER DR
SUITE C
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA — DEPARTMENT OF TRANSPORTATION

DESIGN EXCEPTION FEATURE #10

DESIGN EXCEPTION FEATURE #3
(SEE SHEET P-3)

DESIGN EXCEPTION FEATURE #4
LOCATION 2

MATCHLINE SEE SHEET 11

MATCHLINE SEE SHEET 14

MATCHLINE SEE SHEET 15

MATCHLINE SEE SHEET 16

MATCHLINE SEE SHEET 41

MATCHLINE SEE SHEET 39

MATCHLINE SEE SHEET 40

ADVISORY
DESIGN EXCEPTION
ATTACHMENT 8

SCALE: 1"=100'

SHEET 13

USERNAME => DATE PLOTTED => 5/24/2010
00-00-00 TIME PLOTTED => 11:03:32 AM

BORDER LAST REVISED 8/11/2008 ...

RELATIVE BORDER SCALE 0 1 2 3

USERNAME => LAN Engineering

CU 00000

EA 000000

ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - CURVE AT END OF LONG TANGENT EXCEEDS DESIGN SPEED OF PREVIOUS
DESIGN EXCEPTION FEATURE #3 - HORIZONTAL AND VERTICAL CURVE ALIGNMENT CONSISTENCY
DESIGN EXCEPTION FEATURE #10 - FREEWAY CONNECTOR DESIGN SPEED (50 mph)

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/17.75		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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

REGISTERED PROFESSIONAL ENGINEER — CIVIL — STATE OF CALIFORNIA

LAN ENGINEERING CORP
1887 BUSINESS CENTER DR
SUITE 6
SAN BERNARDINO, CA 92408

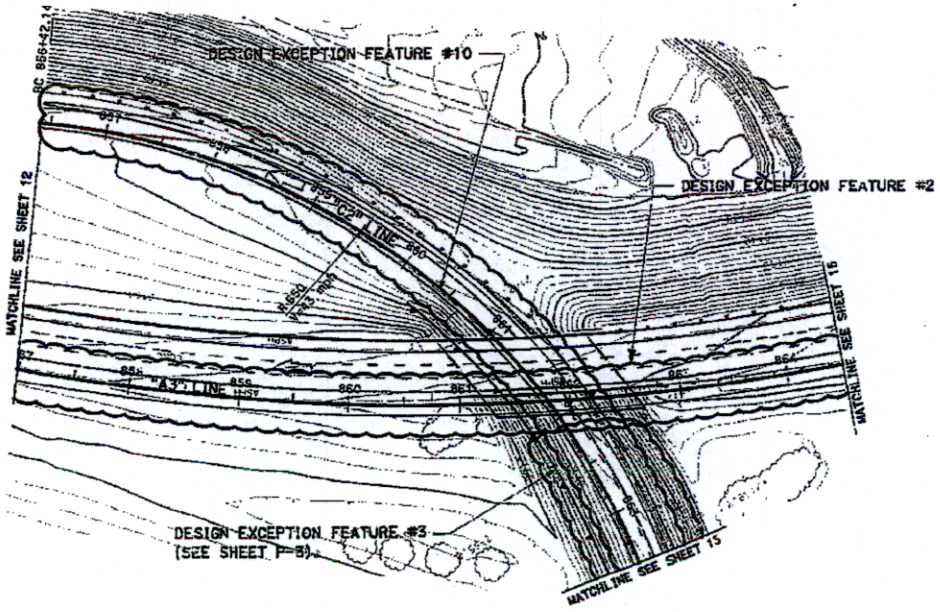
SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA — DEPARTMENT OF TRANSPORTATION



ADVISORY DESIGN EXCEPTION ATTACHMENT 9

SCALE: 1"=100'

SHEET 14

ISSUANCE DATE PLOTTED => 5/24/2010
00-00-00 TIME PLOTTED => 11:08:09 AM

BORDER LAST REVISED 4/11/2003

RELATIVE BORDER SCALE 0 1 2 3

USERNAME => LAN Engineering

CU 00000 EA 000000

ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #2 - CURVE AT END OF LONG TANGENT EXCEEDS DESIGN SPEED OF PREVIOUS

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

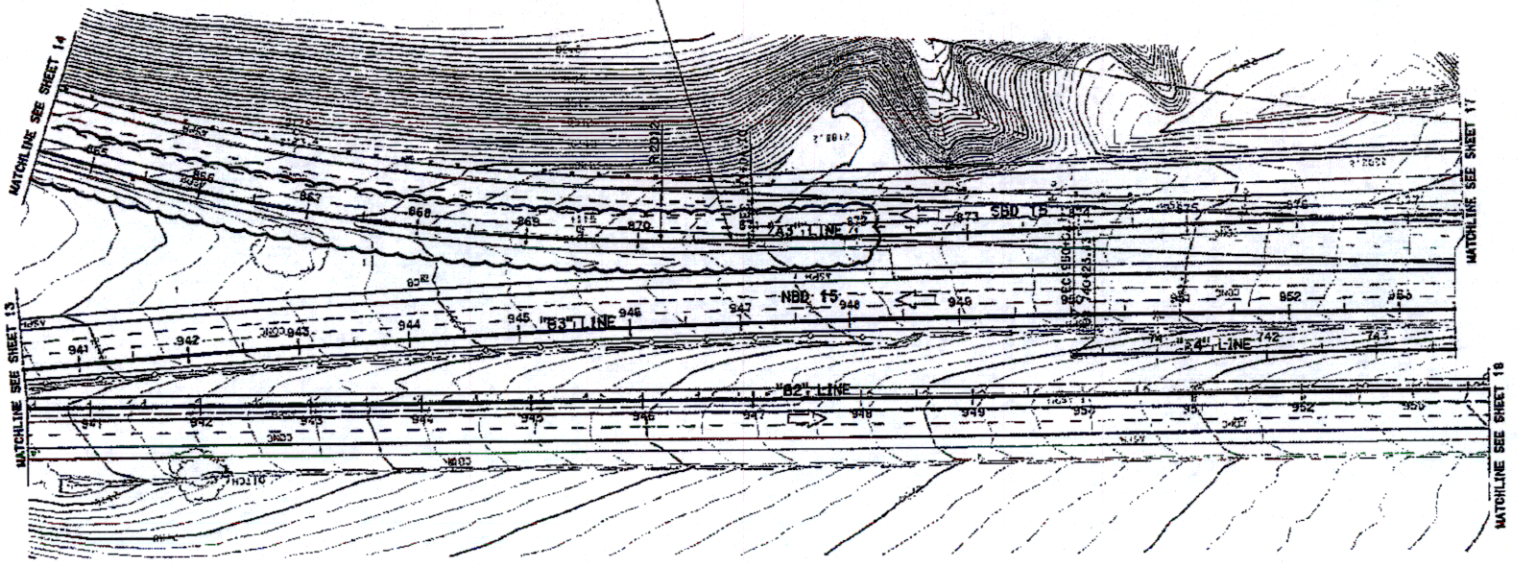
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

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

LAN ENGINEERING CORP
1887 BUSINESS CENTER DR
SUITE E
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

DESIGN EXCEPTION FEATURE #2



REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

ADVISORY DESIGN EXCEPTION ATTACHMENT 10

SCALE: 1"=100'

SHEET 15

BORDER LAST REVISED 6/11/2009

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

DGN FILE

CU 00000 EA 000000

LOCK/UNLOCK DATE PLOTTED => 6/24/2010
00-00-00 TIME PLOTTED => 11:16:23 AM

ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #7 - RAMP TERMINALS AND GRADE

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

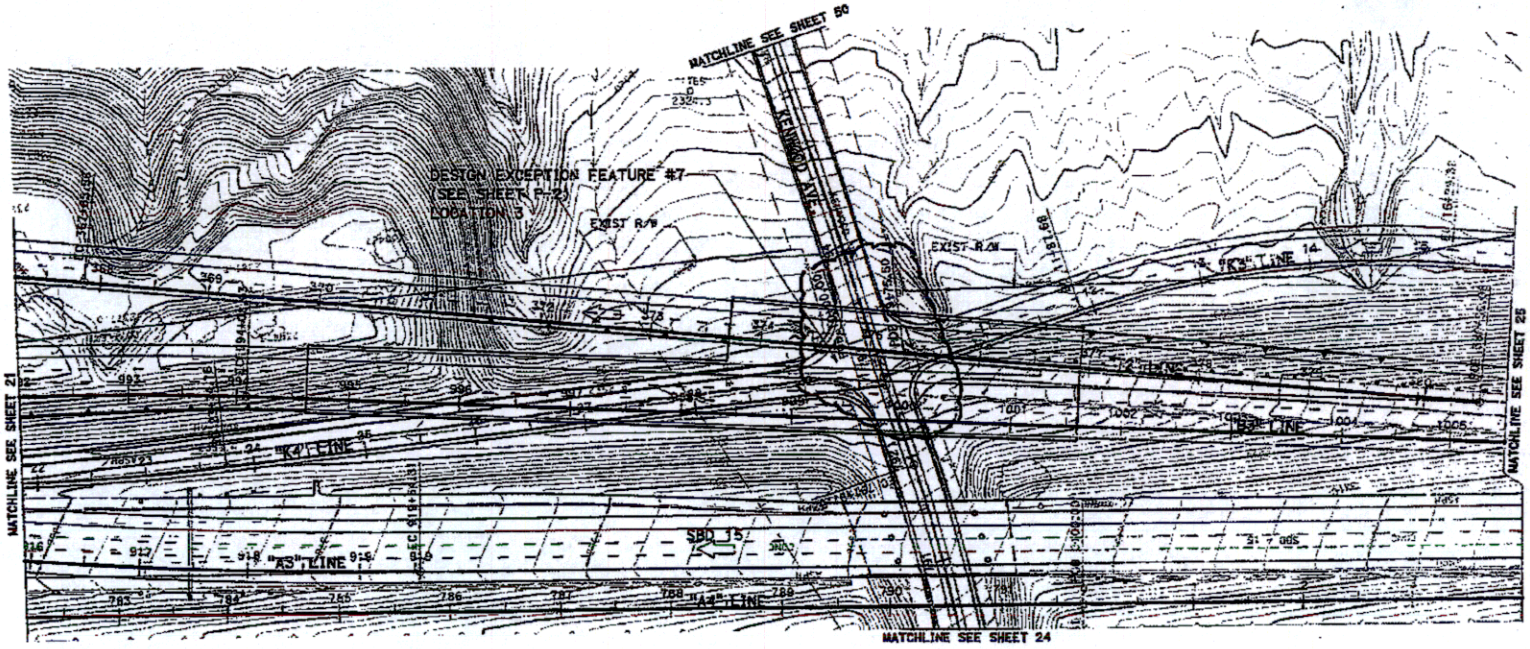
PLANS APPROVAL DATE

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

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

LAN ENGINEERING CORP
687 BUSINESS CENTER DR
SUITE C
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410



ADVISORY DESIGN EXCEPTION ATTACHMENT 11

SCALE: 1"=100'

SHEET 23

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

STATE OF CALIFORNIA -- DEPARTMENT OF TRANSPORTATION

BORDER LAST REVISED 8/11/2006

RELATIVE BORDER SCALE 0 1 2 3

USERNAME = LAN Engineering

DU 000000 | EA 000000

ASSOCIATED DATE PLOTTED = 8/24/2010
00-00-00 TIME PLOTTED = 11:08:52 AM

ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #7 - RAMP TERMINALS AND GRADE
DESIGN EXCEPTION FEATURE #8 - RAMP TERMINAL SIGHT DISANCE

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08	SBD	15, 215	13.5/16.0, 16.0/17.13		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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

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

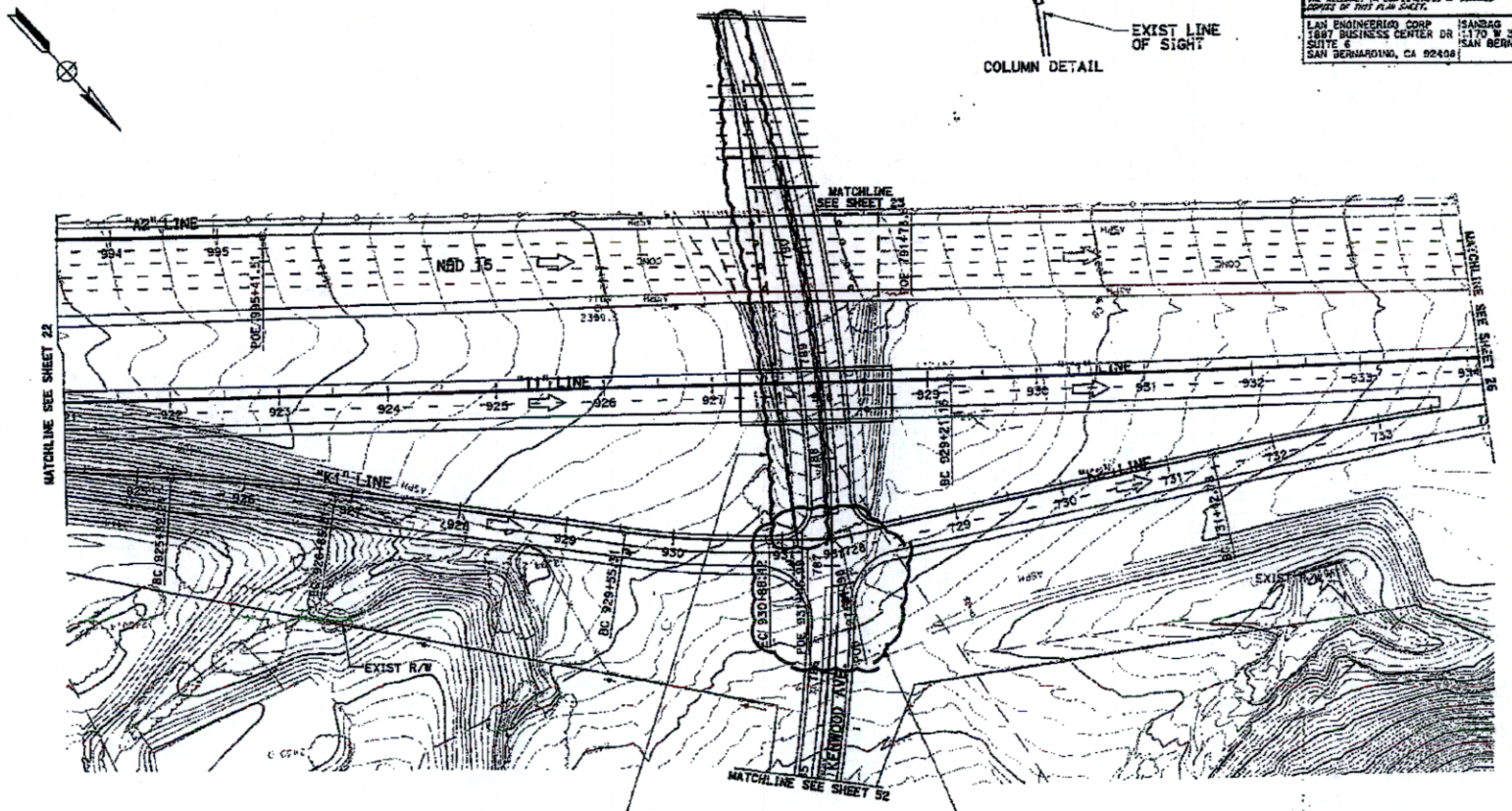
LAN ENGINEERING CORP
1897 BUSINESS CENTER DR
SUITE 6
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

STD LINE OF SIGHT

EXIST LINE OF SIGHT

COLUMN DETAIL



ADVISORY
DESIGN EXCEPTION
ATTACHMENT 12

SCALE: 1"=100'

SHEET 24

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

CONSULTANT FUNCTIONAL SUPERVISOR

CALCULATED-DESIGNED BY

CHECKED BY

REVISED BY

DATE REVISED

RELATIVE BORDER SCALE IS IN INCHES

USERNAME =>LAN Engineering
DGN FILE =>A17 38 Advisory 24.dgn

CU 00000

EA 000000

PLOTTED =>5/21/2010
TIME PLOTTED =>11:10:16 AM

ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #6 - TWO CURB RAMPS AT EACH CORNER
DESIGN EXCEPTION FEATURE #7 - RAMP TERMINALS & GRADE

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

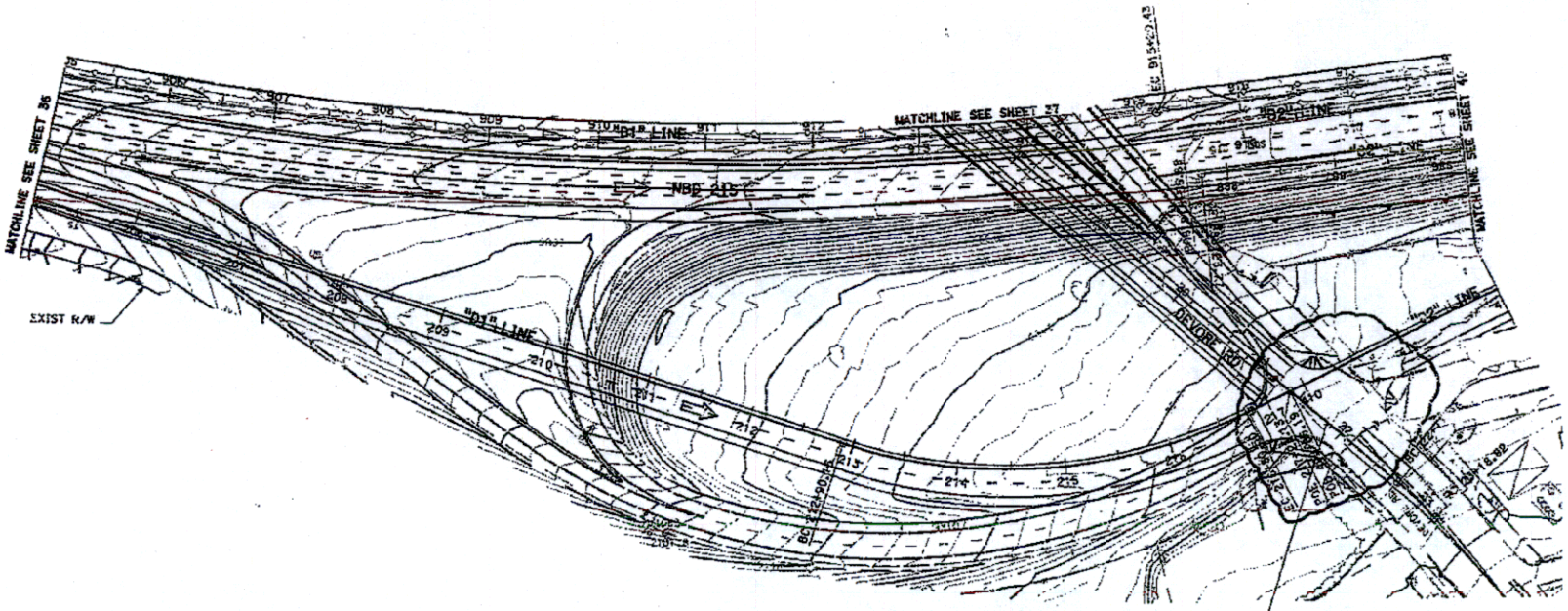
PLANS APPROVAL DATE

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

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

LAN ENGINEERING CORP
1897 BUSINESS CENTER DR
SUITE A
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410



DESIGN EXCEPTION FEATURE #6 - LOCATION 1
DESIGN EXCEPTION FEATURE #7 - LOCATION 1
(SEE SHEET P-4)

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

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION | CONSULTANT FUNCTIONAL SUPERVISOR

ADVISORY DESIGN EXCEPTION ATTACHMENT 13

SCALE: 1"=100'

SHEET 38

DATE PLOTTED =>8/24/2010
TIME PLOTTED => 11:16:45 AM

BORDER_LAST_REVISED 4/11/2008

RELATIVE BORDER SCALE 0 1 2 3

USERNAME =>LAN Engineering

OU 00000 | EA 000000

ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #4 - MINIMUM MEDIAN WIDTH
DESIGN EXCEPTION FEATURE #10 - FREEWAY CONNECTOR DESIGN SPEED (50 mph)

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
08	SBd	15, 215	13.5/16.0 16.0/17.75		

REGISTERED CIVIL ENGINEER DATE

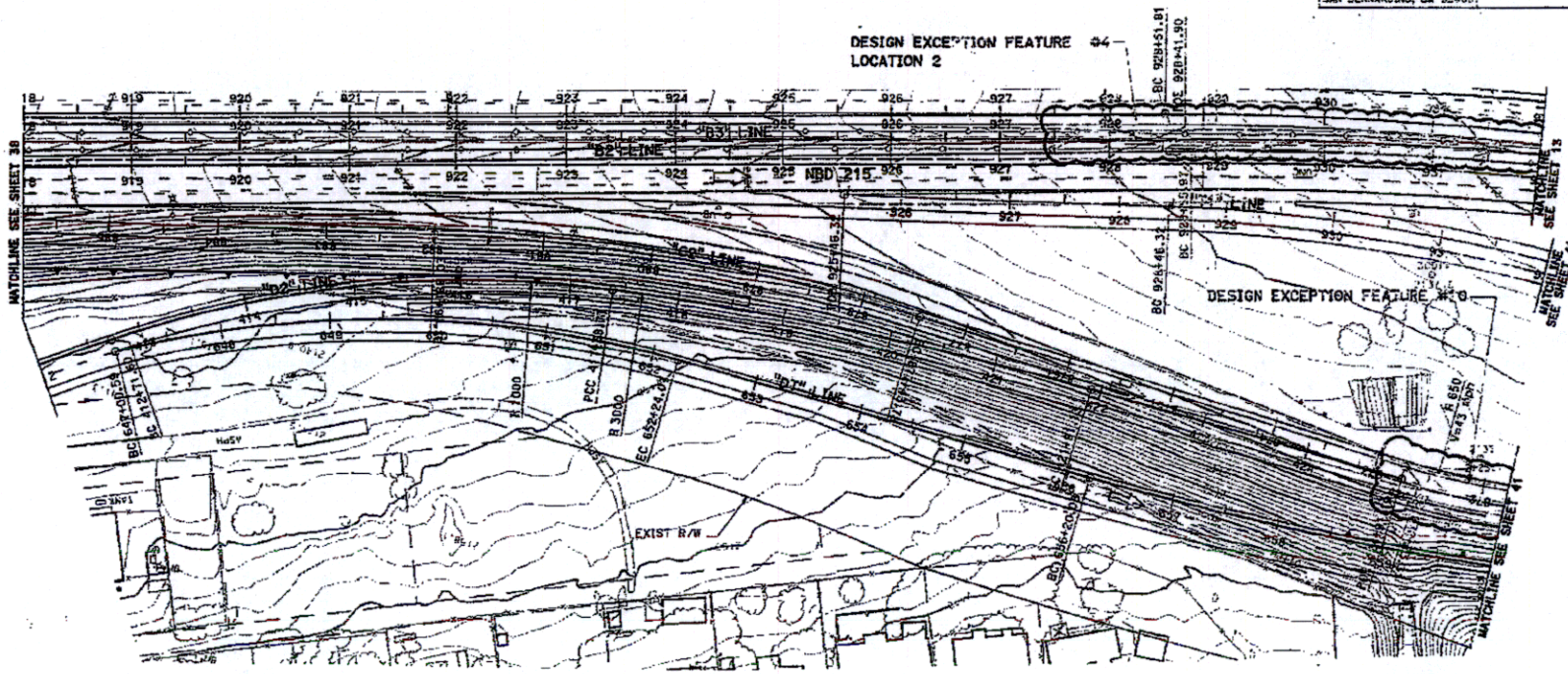
PLANS APPROVAL DATE

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

REGISTERED PROFESSIONAL ENGINEER CIVIL STATE OF CALIFORNIA

LAN ENGINEERING CORP
1597 BUSINESS CENTER DR
SUITE E
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410



ADVISORY
DESIGN EXCEPTION
ATTACHMENT 14
SCALE: 1"=100'

SHEET 40

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
CONSULTANT FUNCTIONAL SUPERVISOR
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED

BORDER LAST REVISED 6/11/2008

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => LAN Engineering

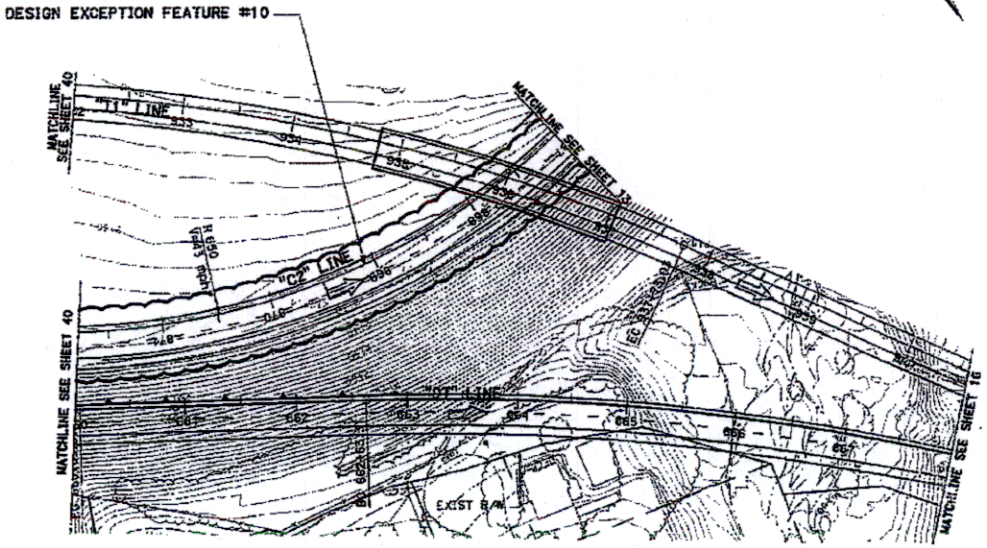
CU 00000

EA 000000

DATE PLOTTED => 5/24/2010
TIME PLOTTED => 11:11:14 AM
00-00-00

ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #10 - FREEWAY CONNECTOR DESIGN SPEED (50 mph)



Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL No. SHEETS
08	SBd	15, 215	15.6/16.0 16.0/17.73	

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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

REGISTERED PROFESSIONAL ENGINEER — CIVIL — STATE OF CALIFORNIA

LAN ENGINEERING CORP
1867 BUSINESS CENTER DR
SUITE 2
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

ADVISORY DESIGN EXCEPTION ATTACHMENT 15

SCALE: 1"=100'

SHEET 41

DATE PLOTTED => 5/24/2019
TIME PLOTTED => 11:11:40 AM

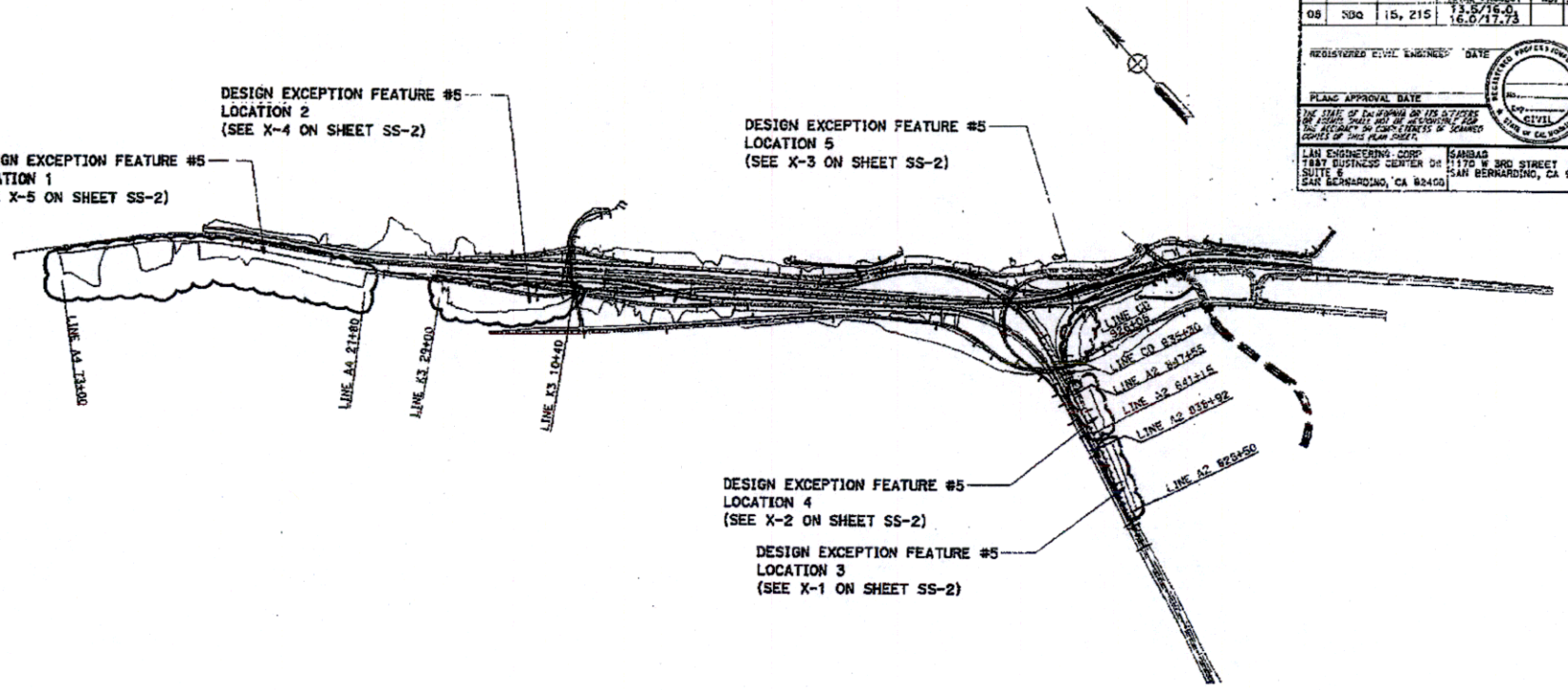
BORDER LAST REVISED 9/11/2008

RELATIVE BORDER SCALE IS IN INCHES. 0 1 2 3

USERNAME => LAN Engineering

DGN FILE => Att 15 Adv Design Exc.dgn

CU 00000 EA 000000



Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBD	15, 215	13.5/16.0 16.0/17.73		

REGISTERED CIVIL ENGINEER — DATE

PLANS APPROVAL DATE

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

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

LAN ENGINEERING CORP
1881 BUSINESS CENTER DR
SUITE 6
SAN BERNARDINO, CA 92408

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY

CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

ADVISORY DESIGN EXCEPTION FEATURES:

DESIGN EXCEPTION FEATURE #5 - EMBANKMENT FILL SLOPES SHOULD BE 4:1 OR FLATTER

ADVISORY DESIGN EXCEPTION ATTACHMENT 16

NO SCALE

SS-1

BORDER LAST REVISED 4/11/2008

RELATIVE BORDER SCALE

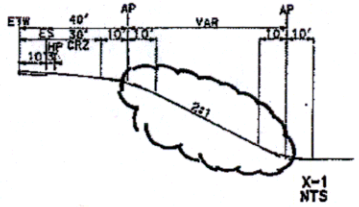
USERNAME => LAN Engineering

CU 00000 EA 000000

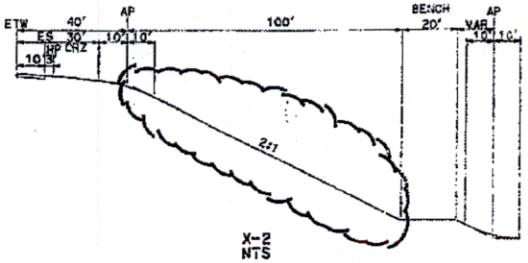
DATE PLOTTED => 5/21/2010
TIME PLOTTED => 11:12:46 AM

ADVISORY DESIGN EXCEPTION FEATURES:

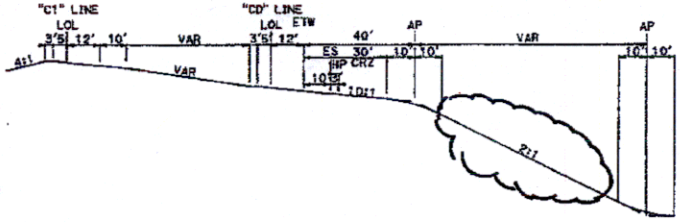
DESIGN EXCEPTION FEATURE #5 – EMBANKMENT FILL SLOPES SHOULD BE 4:1 OR FLATTER



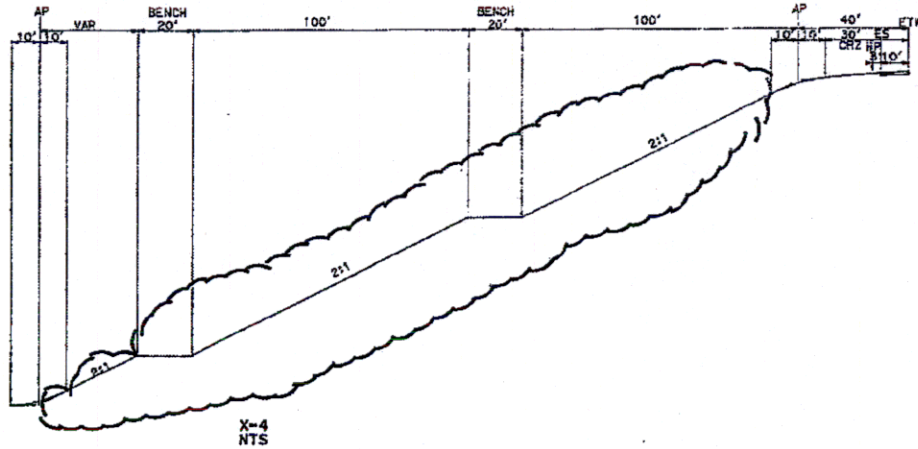
X-1
NTS



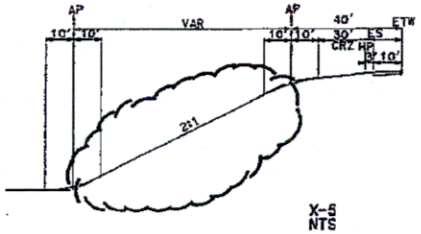
X-2
NTS



X-3
NTS



X-4
NTS



X-5
NTS

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	15.5/16.9 16.0/17.73		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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

REGISTERED PROFESSIONAL ENGINEER
No.
Exp.
CIVIL
STATE OF CALIFORNIA

LAR ENGINEERING CORP
1867 BUSINESS CENTER DR
SUITE 6
SAN BERNARDINO, CA 92408

CAMBAO
1175 W 3RD STREET
SAN BERNARDINO, CA 92410

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA – DEPARTMENT OF TRANSPORTATION

ADVISORY DESIGN EXCEPTION ATTACHMENT 17

NO SCALE

SS-2

DATE PLOTTED => 6/24/2010
TIME PLOTTED => 11:13:12 AM

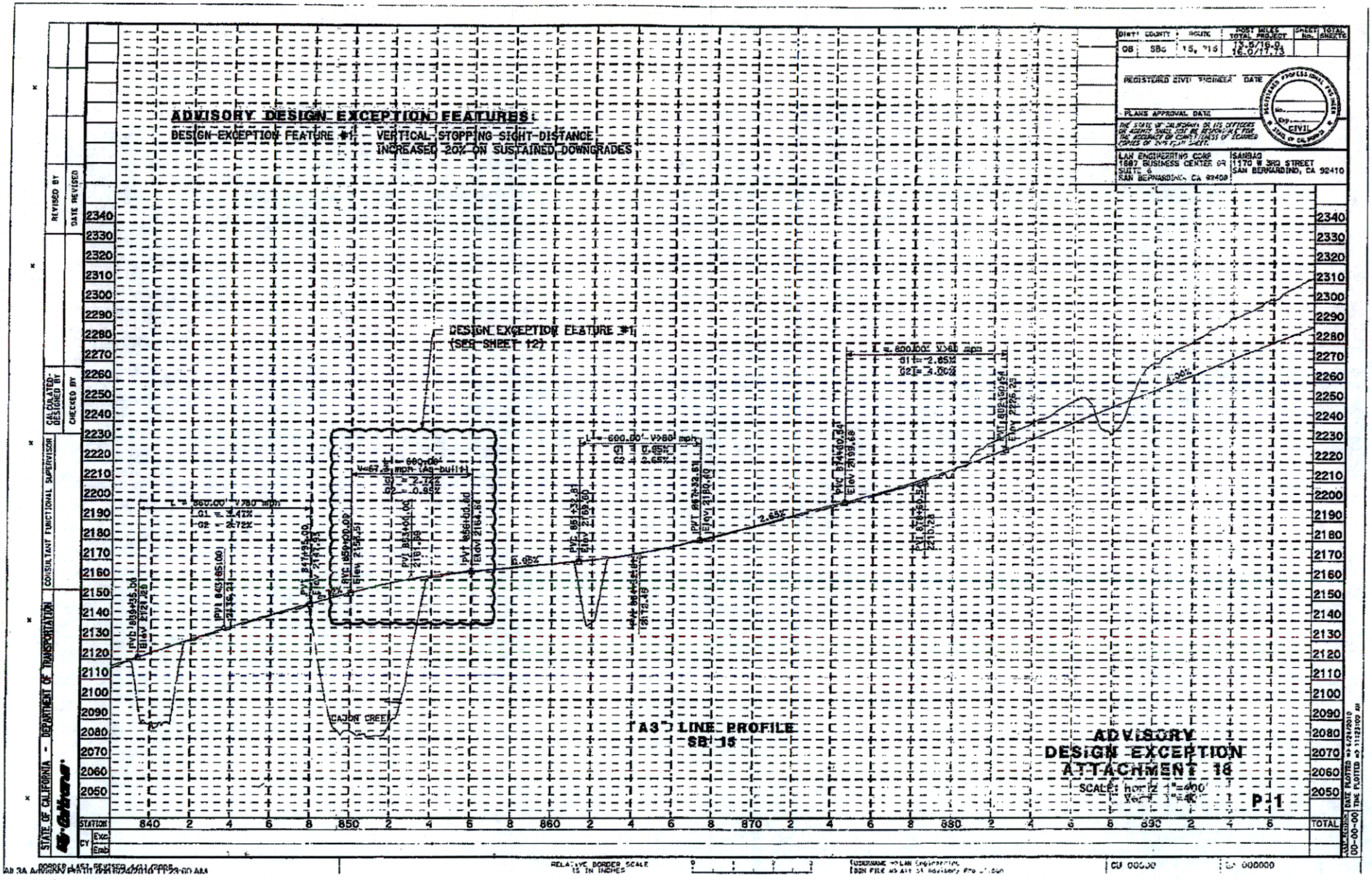
BORDER LAST REVISED 4/11/2008

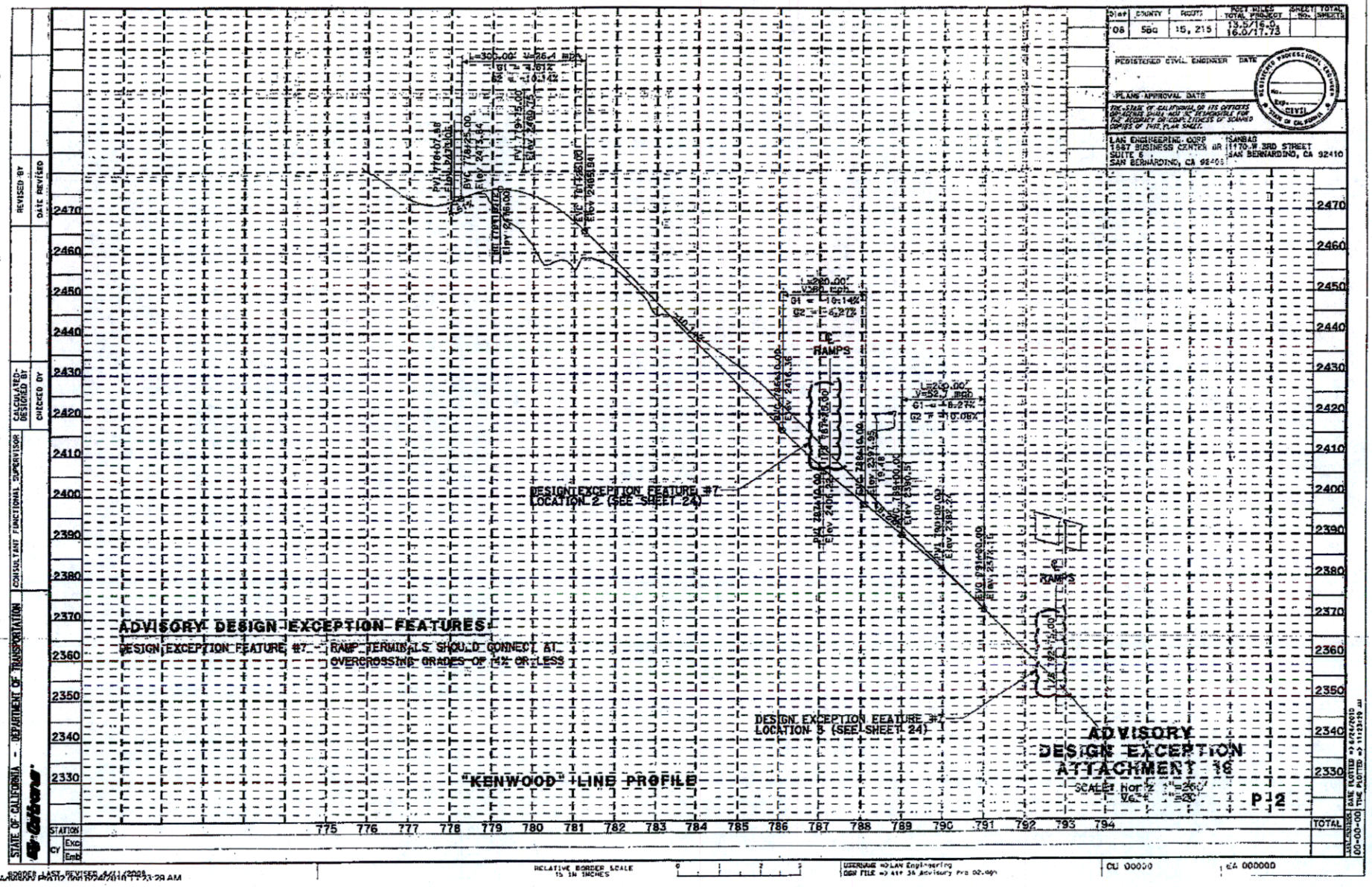
RELATIVE BORDER SCALE
15 IN INCHES
0 1 2 3

USERNAME => LAR Engineering
DGN FILE => 01 SS Advisory Slide Sheets 2.dgn

CU 00000

EA 000000


ADVISORY DESIGN EXCEPTION FEATURES:
DESIGN EXCEPTION FEATURE #1 – VERTICAL STOPPING SIGHT-DISTANCE INCREASED 20% ON SUSTAINED DOWNGRADES
DESIGN EXCEPTION FEATURE #1 (SEE SHEET 12)
CAJON CREEK
"A3" LINE PROFILE
SB 15
ADVISORY DESIGN EXCEPTION ATTACHMENT 16
SCALE: horiz 1"=400'
vert 1"=40'
P11
STATE OF CALIFORNIA – DEPARTMENT OF TRANSPORTATION
CONSULTANT FUNCTIONAL SUPERVISOR
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED
DIST COUNTY ROUTE POST MILES TOTAL PROJECT SHEET No. TOTAL SHEETS
08 SBd 15, 215 15.5/19.0 15.0/17.5
REGISTERED CIVIL ENGINEER DATE
PLANS APPROVAL DATE
LAN ENGINEERING CORP 1687 BUSINESS CENTER DR SUITE G SAN BERNARDINO, CA 92408
SANBAG 1170 W 3RD STREET SAN BERNARDINO, CA 92410
STATION
CY Exc Emb
TOTAL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DESIGN EXCEPTION FEATURE #7 - RAMP TERMINALS SHOULD CONNECT AT OVERCROSSING GRADES OF 4% OR LESS
"KENWOOD" LINE PROFILE
DESIGN EXCEPTION FEATURE #7 LOCATION 2 (SEE SHEET 24)
DESIGN EXCEPTION FEATURE #7 LOCATION 5 (SEE SHEET 24)
RAMPS
ADVISORY DESIGN EXCEPTION ATTACHMENT 16
SCALE: Hor 1" = 200'
Ver 1" = 20'
P12
STATION
775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794
TOTAL
2470 2460 2450 2440 2430 2420 2410 2400 2390 2380 2370 2360 2350 2340 2330
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
CALCULATED-DESIGNED BY
CHECKED BY
CONSULTANT FUNCTIONAL SUPERVISOR
REVISED BY
DATE REVISED
Dist 08 | COUNTY SBD | ROUTE 15, 215 | POST MILES TOTAL PROJECT 13.5/16.0 16.0/17.73 | SHEET NO. | TOTAL SHEETS
REGISTERED CIVIL ENGINEER DATE
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.
REGISTERED PROFESSIONAL ENGINEER
No.
Exp. 6/30/11
CIVIL
STATE OF CALIFORNIA
LAN ENGINEERING CORP
1687 BUSINESS CENTER DR
SUITE 5
SAN BERNARDINO, CA 92408
SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410
CU 00000
EA 000000
USERNAME => LAN Engineering
DGN FILE => adv 3A Advisory Pro 02.dgn
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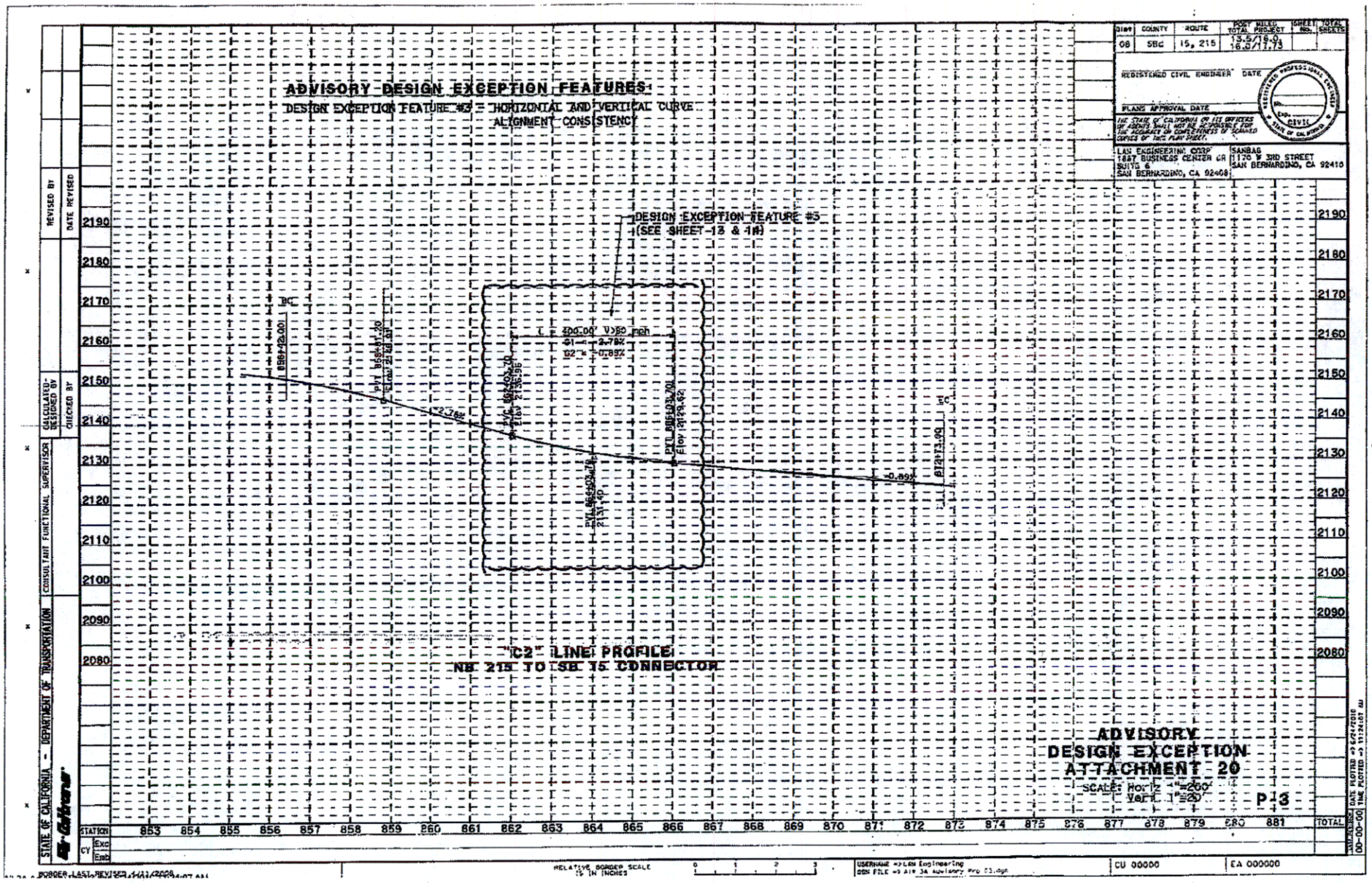
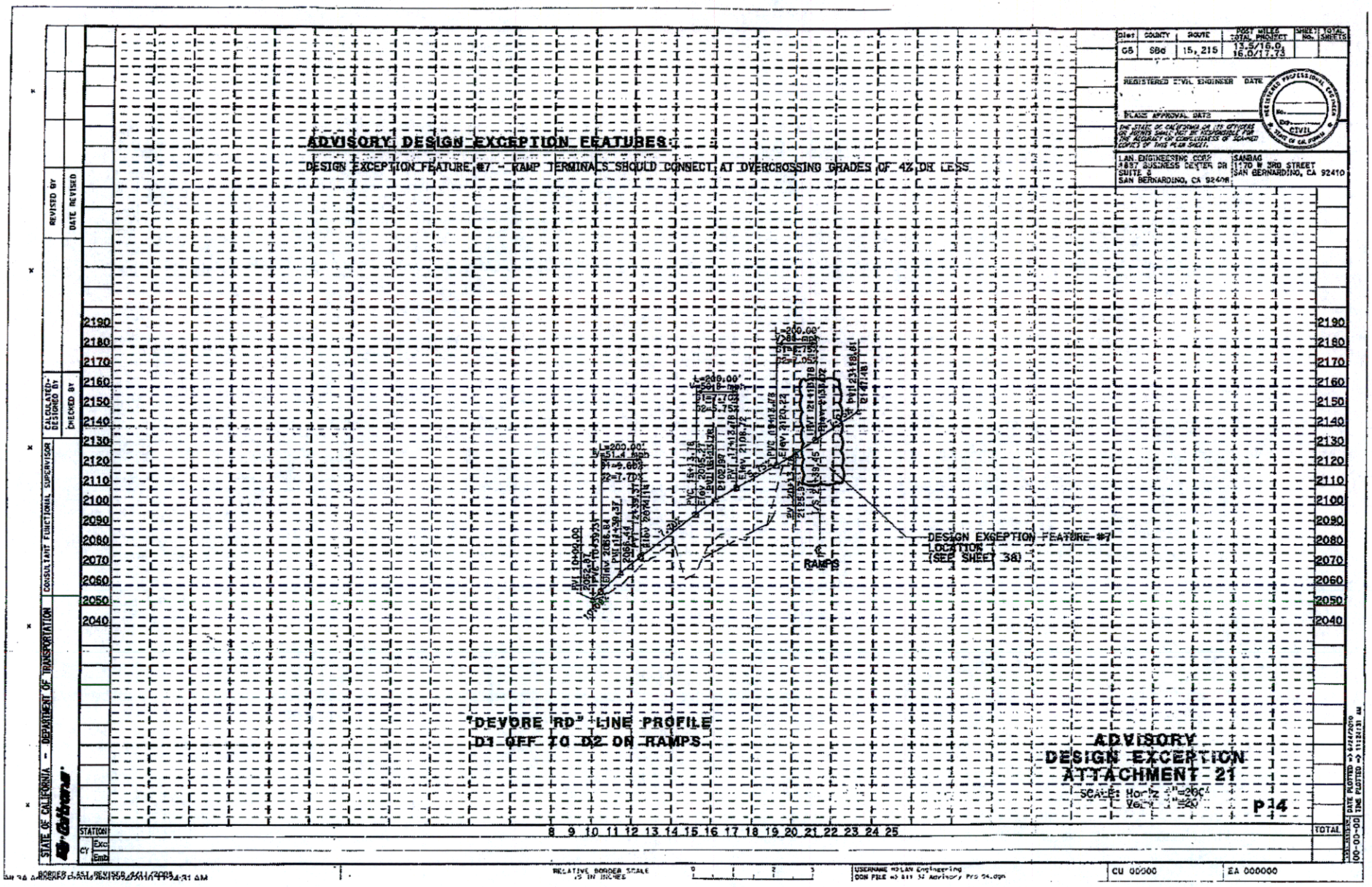
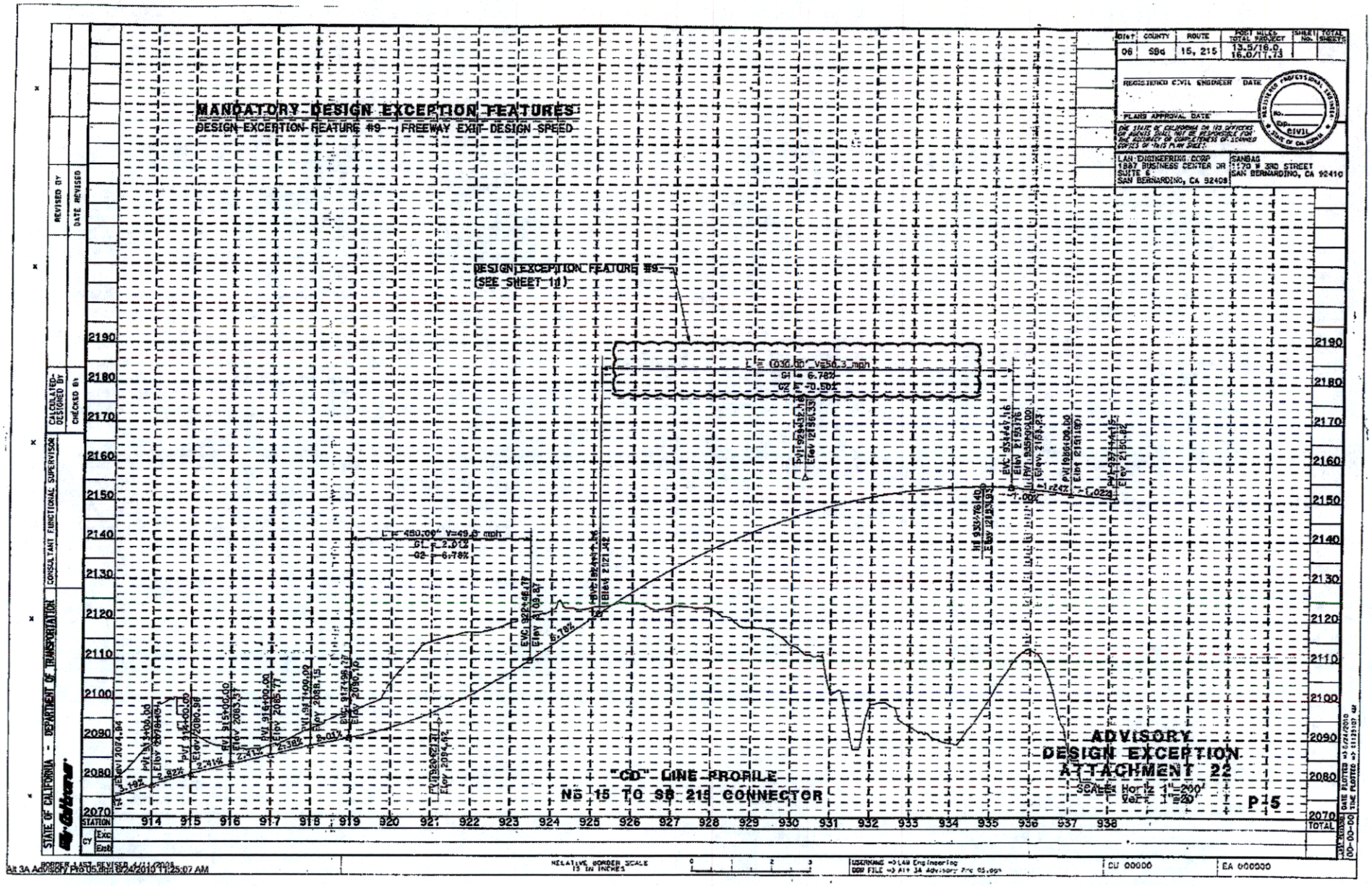
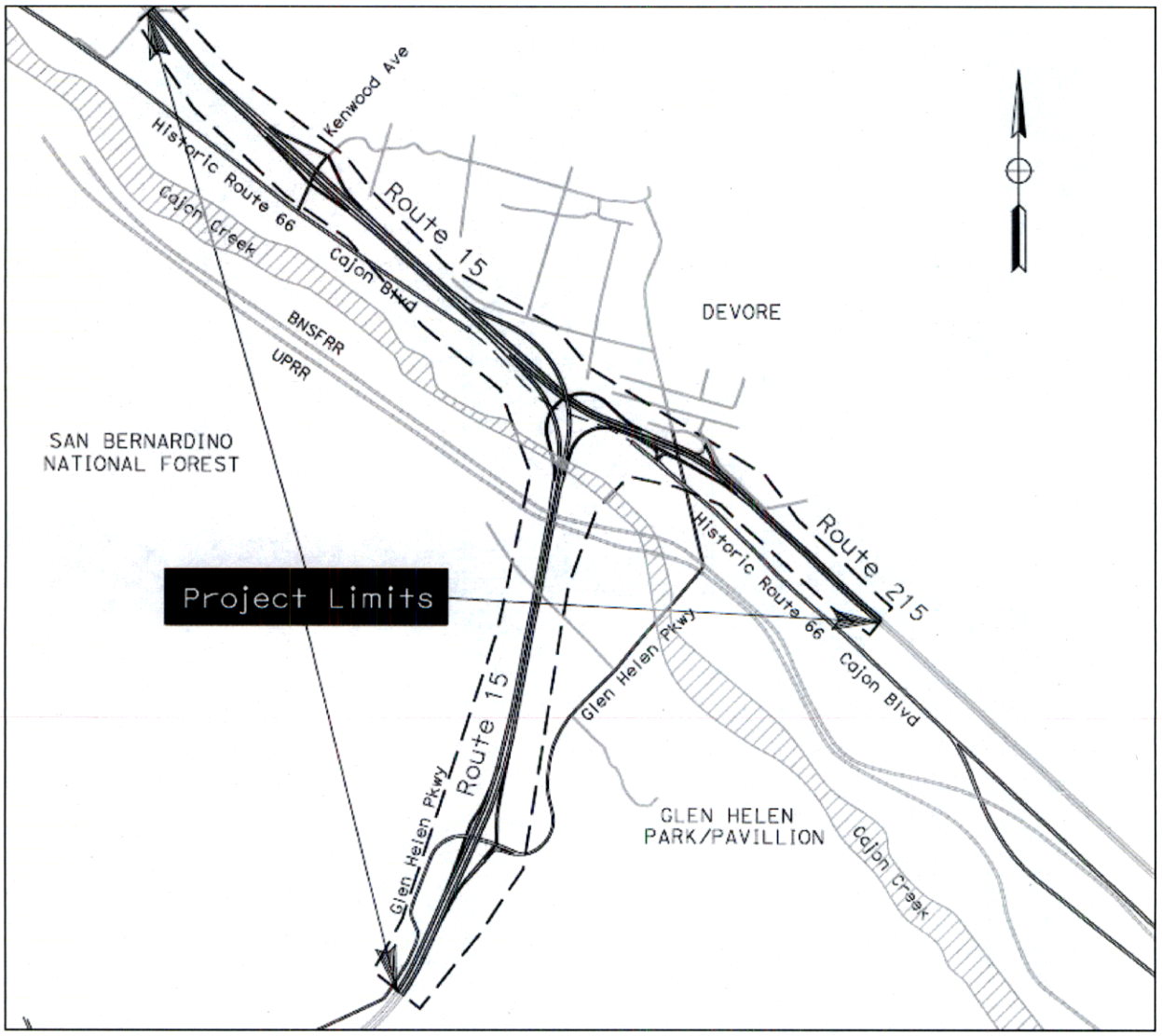
0 1 2 3
BORDER LAST REVISED 4/11/2008
DATE PLOTTED => 6/24/2010
TIME PLOTTED => 11:23:39 AM


ADVISORY DESIGN EXCEPTION FEATURES:
DESIGN EXCEPTION FEATURE #3 = HORIZONTAL AND VERTICAL CURVE ALIGNMENT CONSISTENCY
DESIGN EXCEPTION FEATURE #3 (SEE SHEET 13 & 14)
"C2" LINE PROFILE
NB 215 TO SB 15 CONNECTOR
ADVISORY DESIGN EXCEPTION ATTACHMENT 20
SCALE: Horiz 1"=200'
Vert 1"=20'
P13
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
CONSULTANT FUNCTIONAL SUPERVISOR
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED
Dist 08 | COUNTY SBd | ROUTE 15, 215 | POST MILES TOTAL PROJECT 13.5/19.9 16.3/17.73
REGISTERED CIVIL ENGINEER DATE
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.
LAN ENGINEERING CORP 1847 BUSINESS CENTER DR SUITE 6 SAN BERNARDINO, CA 92408
SANBAG 1170 W 3RD STREET SAN BERNARDINO, CA 92410
STATION 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 TOTAL
CY Exc Emb
RELATIVE BORDER SCALE IS IN INCHES
USERNAME =>LAN Engineering
DGN FILE =>Alt 3A Advisory Prof 21.dgn
CU 00000
EA 000000
DATE PLOTTED =>
TIME PLOTTED =>


ADVISORY DESIGN EXCEPTION FEATURES:
DESIGN EXCEPTION FEATURE #7 - RAMP TERMINALS SHOULD CONNECT AT OVERCROSSING GRADES OF 4% OR LESS
DESIGN EXCEPTION FEATURE #7 LOCATION (SEE SHEET 38)
RAMPS
"DEVORE RD" LINE PROFILE
D1 OFF TO D2 ON RAMPS
ADVISORY DESIGN EXCEPTION ATTACHMENT 21
SCALE: Horiz 1"=200'
Vert 1"=20'
P14
STATE OF CALIFORNIA -- DEPARTMENT OF TRANSPORTATION
CONSULTANT FUNCTIONAL SUPERVISOR
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED
Dist COUNTY ROUTE POST MILES TOTAL PROJECT SHEET No. TOTAL SHEETS
08 SBd 15, 215 13.5/16.0 16.0/17.73
REGISTERED CIVIL ENGINEER DATE
PLANS APPROVAL DATE
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.
LAN ENGINEERING CORP 4857 BUSINESS CENTER DR SUITE B SAN BERNARDINO, CA 92408
SANBAG 1170 W 3RD STREET SAN BERNARDINO, CA 92410
STATION
CY Exc Emb
TOTAL
RELATIVE BORDER SCALE IS IN INCHES
USERNAME =DLAN Engineering
DGN FILE =D 811 32 Advisory Prs 24.dgn
CU 00000
EA 000000
DATE PLOTTED => 6/24/2010
TIME PLOTTED => 11:18:31 AM


MANDATORY DESIGN EXCEPTION FEATURES
DESIGN EXCEPTION FEATURE #9 – FREEWAY EXIT DESIGN SPEED
DESIGN EXCEPTION FEATURE #9
(SEE SHEET 11)
"CD" LINE PROFILE
NB 15 TO SB 215 CONNECTOR
ADVISORY
DESIGN EXCEPTION
ATTACHMENT 22
SCALE: Horiz 1"=200'
Vert 1"=20'
P15
STATION
914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938
2190 2180 2170 2160 2150 2140 2130 2120 2110 2100 2090 2080 2070
Dist 06 | COUNTY SBd | ROUTE 15, 215 | POST MILES TOTAL PROJECT 13.5/16.0 16.0/17.73
REGISTERED CIVIL ENGINEER DATE
PLANS APPROVAL DATE
LAN ENGINEERING CORP
1997 BUSINESS CENTER DR
SUITE 6
SAN BERNARDINO, CA 92408
SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410
STATE OF CALIFORNIA – DEPARTMENT OF TRANSPORTATION
CONSULTANT FUNCTIONAL SUPERVISOR
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED
BORDER LAST REVISED 4/11/2008
Alt 3A Advisory Pro05.dgn 9/24/2010 11:25:07 AM
USERNAME => LAN Engineering
CU 00000
EA 000000

Attachment 2
Location Map


Kenwood Ave
Historic Route 66
Cajon Creek
Cajon Blvd
Route 15
DEVORE
BNSFRR
UPRR
SAN BERNARDINO
NATIONAL FOREST
Project Limits
Route 215
Historic Route 66
Cajon Blvd
Glen Helen Pkwy
Route 15
Glen Helen Pkwy
GLEN HELEN
PARK/PAVILLION
Cajon Creek

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	14.0/16.4, 16.0/17.8		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. EXP. CIVIL STATE OF CALIFORNIA

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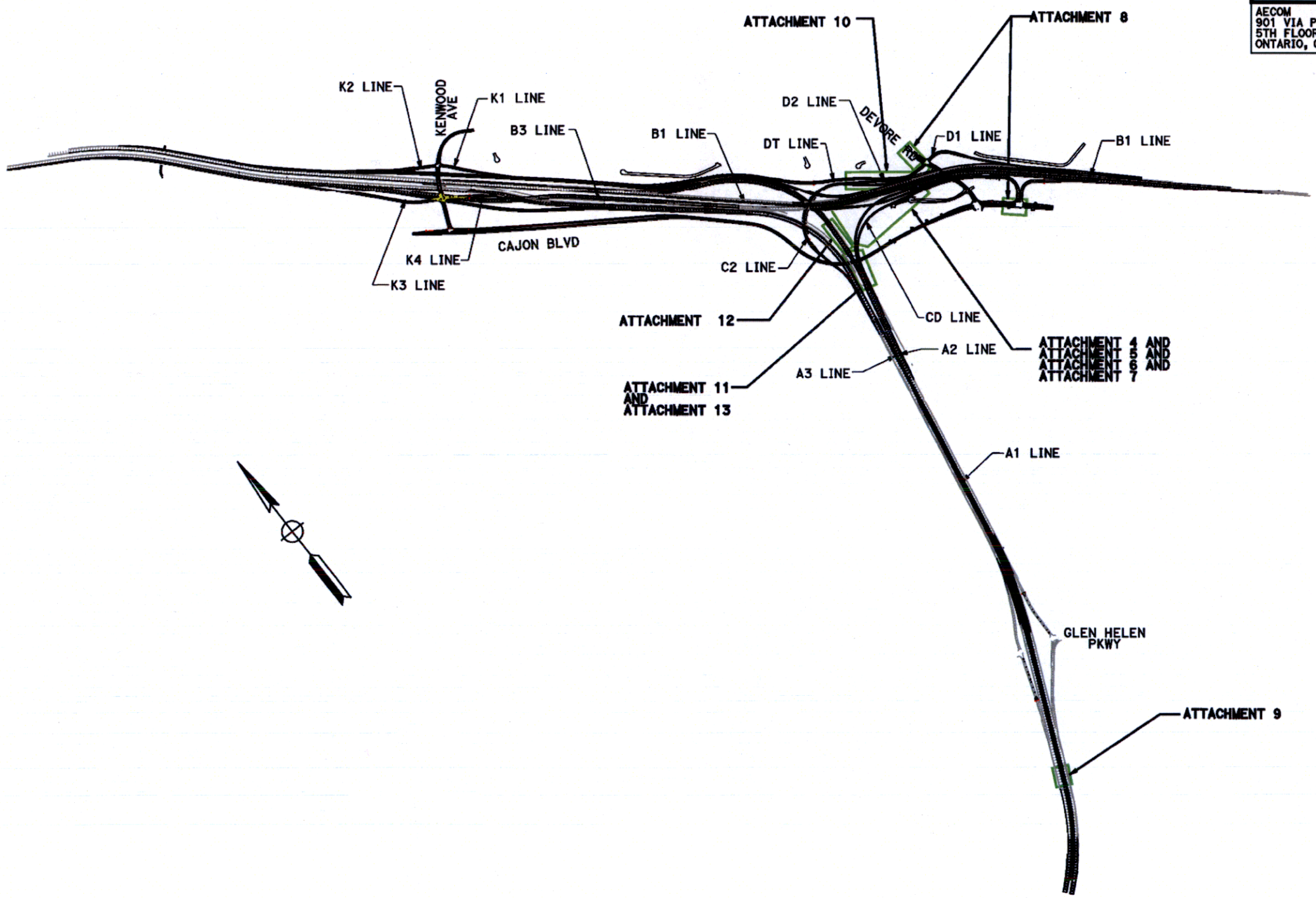
ONTARIO, CA 91764

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410



KEY MAP
ADVISORY
DESIGN EXCEPTION
ATTACHMENT 3

NO SCALE

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

LAST REVISION 00-00-00 | DATE PLOTTED => 1/25/2012 | TIME PLOTTED => 2:40:55 PM

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

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DGN FILE => Alt 3A Advisory key map.dgn

EA 08-0K7100

Alt 3A Advisory key map.dgn 1/25/2012 2:40:56 PM

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	14.0/16.4, 16.0/17.8		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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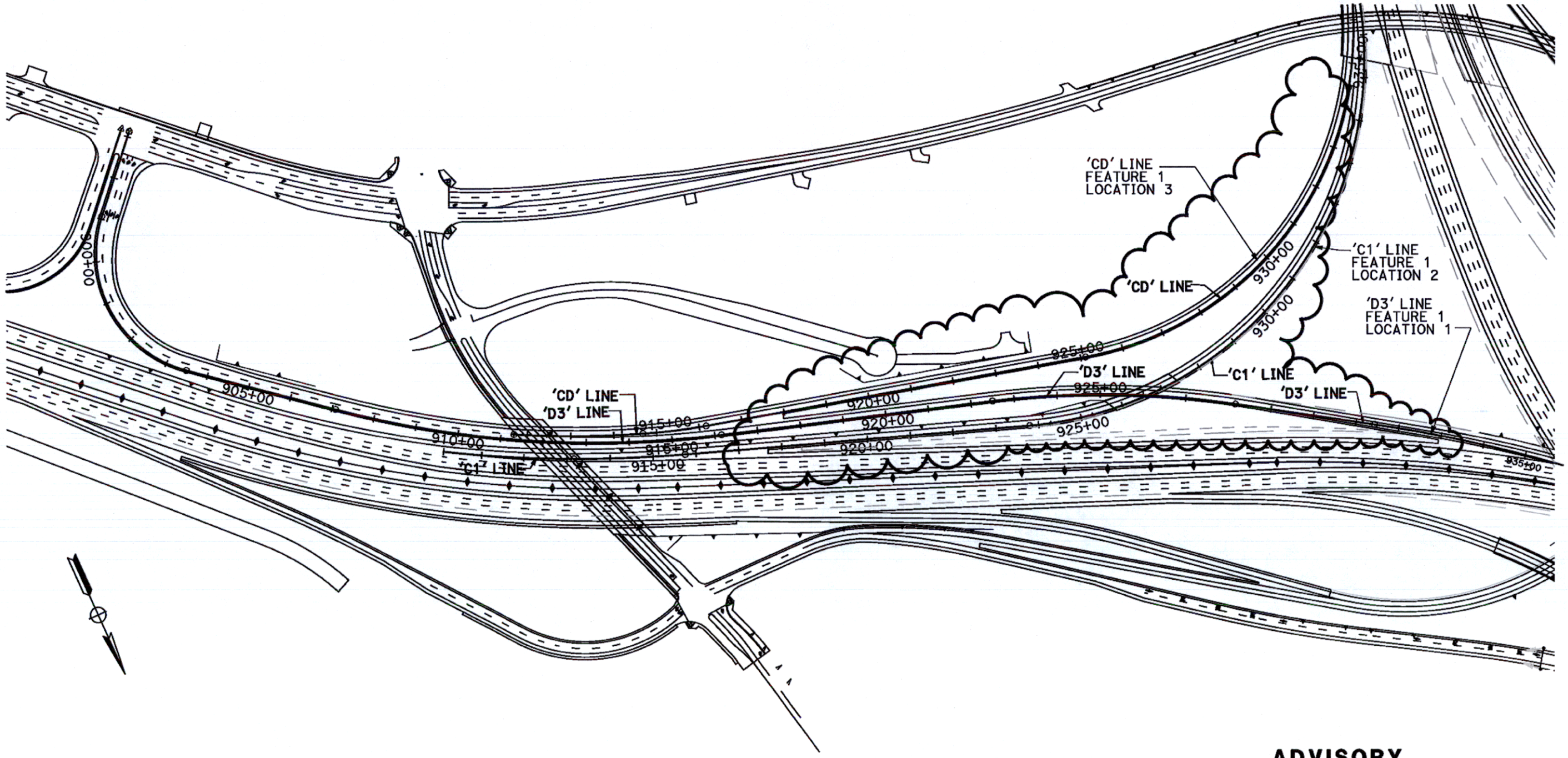
SAN BERNARDINO, CA 92410



'D3' LINE FEATURE 1 LOCATION 1
'C1' LINE FEATURE 1 LOCATION 2
'CD' LINE FEATURE 1 LOCATION 3

ADVISORY DESIGN EXCEPTION ATTACHMENT 4

SCALE: NTS

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LAST REVISION 00-00-00 | DATE PLOTTED => 1/16/2012 | TIME PLOTTED => 8:22:46 AM

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EA 08-0K7100

Alt 3A Advisory 04.dgn 1/16/2012 8:22:47 AM

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	14.0/16.4, 16.0/17.8		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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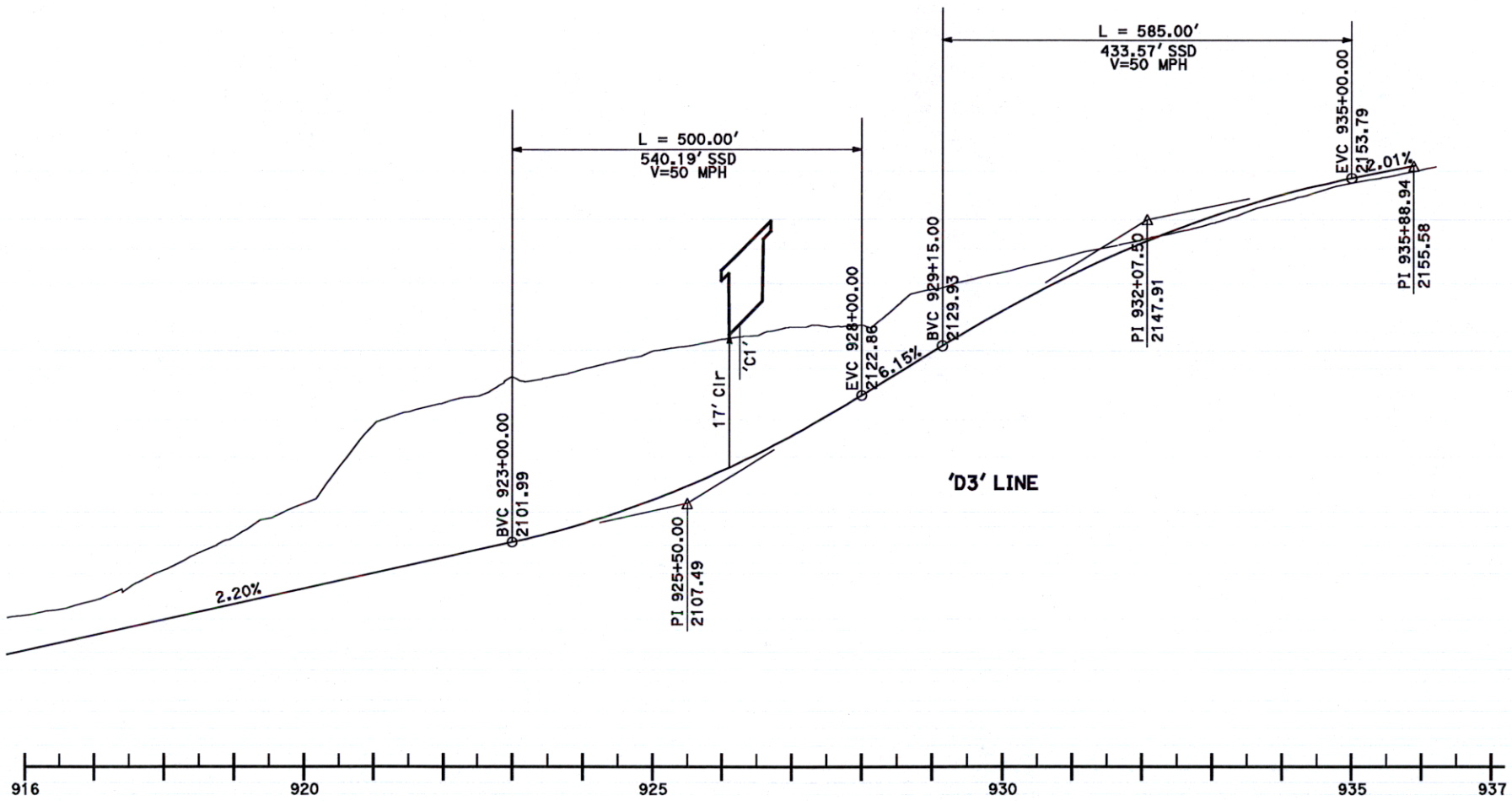
SAN BERNARDINO, CA 92410



'D3' LINE

'D3' LINE FEATURE 1 LOCATION 1

ADVISORY DESIGN EXCEPTION ATTACHMENT 5

SCALE: NTS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
CONSULTANT FUNCTIONAL SUPERVISOR
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LAST REVISION 00-00-00 DATE PLOTTED => 1/3/2012 TIME PLOTTED => 10:18:42 AM

Alt 3A Advisory 05.dgn 1/3/2012 10:18:42 AM

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => AECOM
DGN FILE => Alt 3A Advisory 05.dgn

EA 08-0K7100

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	14.0/16.4, 16.0/17.8		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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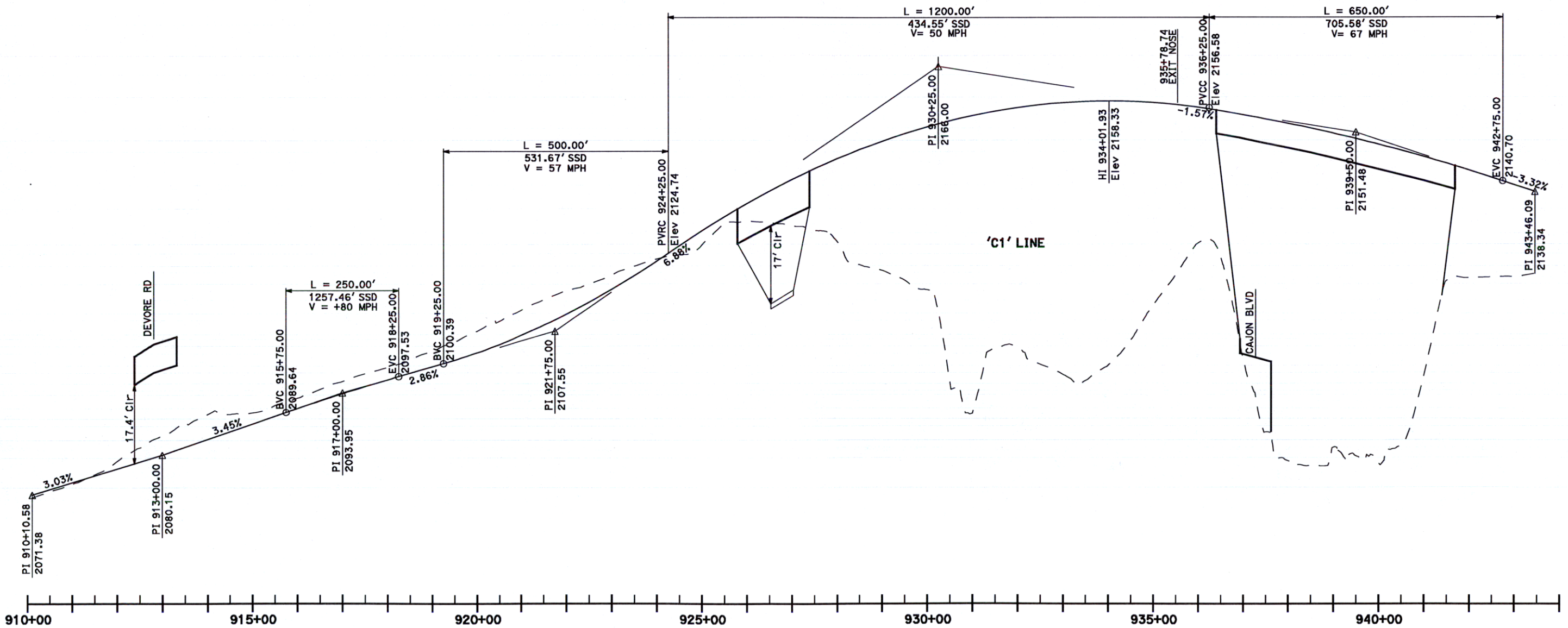
REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY

CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



'C1' LINE FEATURE 1 LOCATION 2

ADVISORY DESIGN EXCEPTION ATTACHMENT 6

SCALE: NTS

LAST REVISION 00-00-00 DATE PLOTTED => 1/3/2012 TIME PLOTTED => 10:20:37 AM

Alt 3A Advisory 06.dgn 1/3/2012 10:20:37 AM

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => AECOM
DGN FILE => Alt 3A Advisory 06.dgn

EA 08-0K7100

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	14.0/16.4, 16.0/17.8		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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

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5TH FLOOR
ONTARIO, CA 91764

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

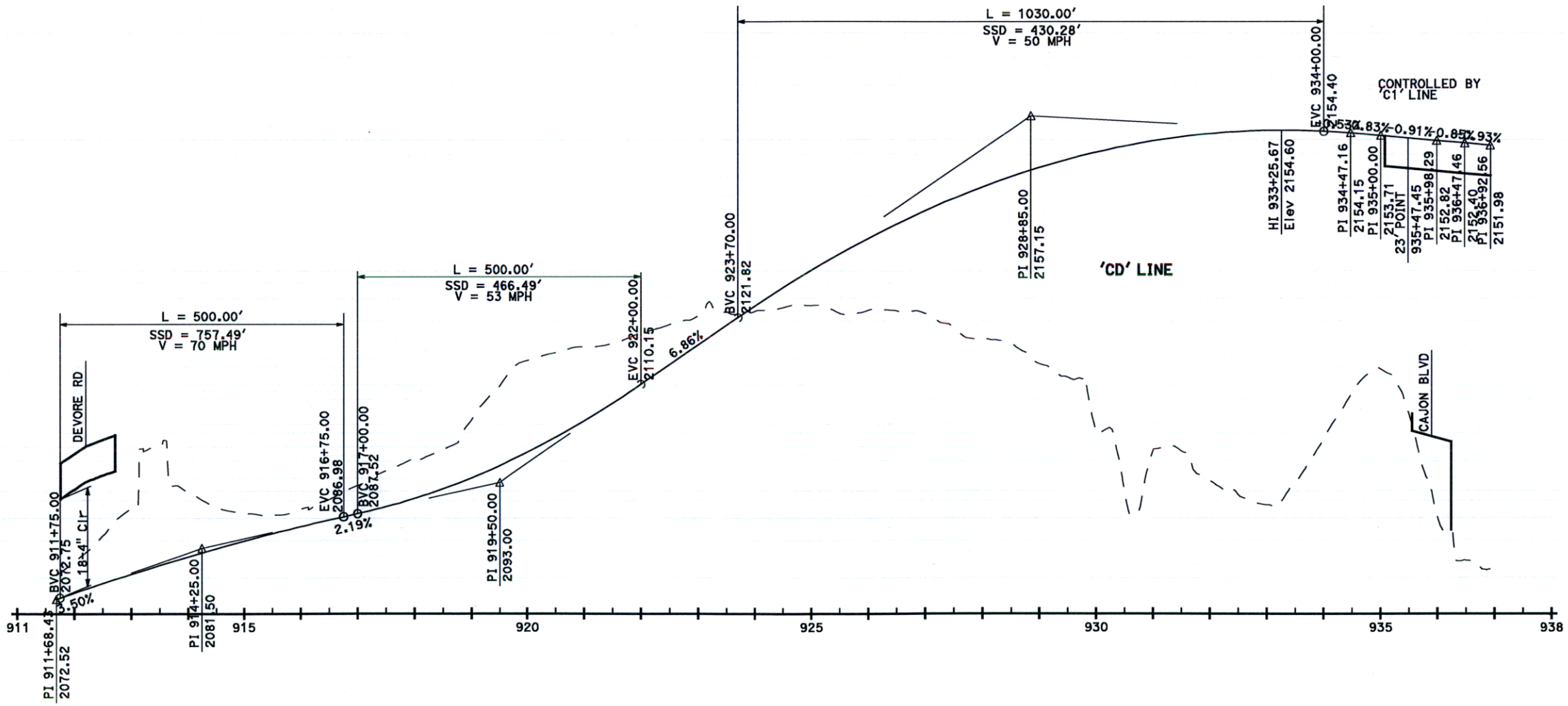
REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY

CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



'CD' LINE FEATURE 1 LOCATION 3

ADVISORY DESIGN EXCEPTION ATTACHMENT 7

SCALE: NTS

LAST REVISION 00-00-00 DATE PLOTTED => 1/3/2012 TIME PLOTTED => 10:21:05 AM

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	14.0/16.4, 16.0/17.8		

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PLANS APPROVAL DATE

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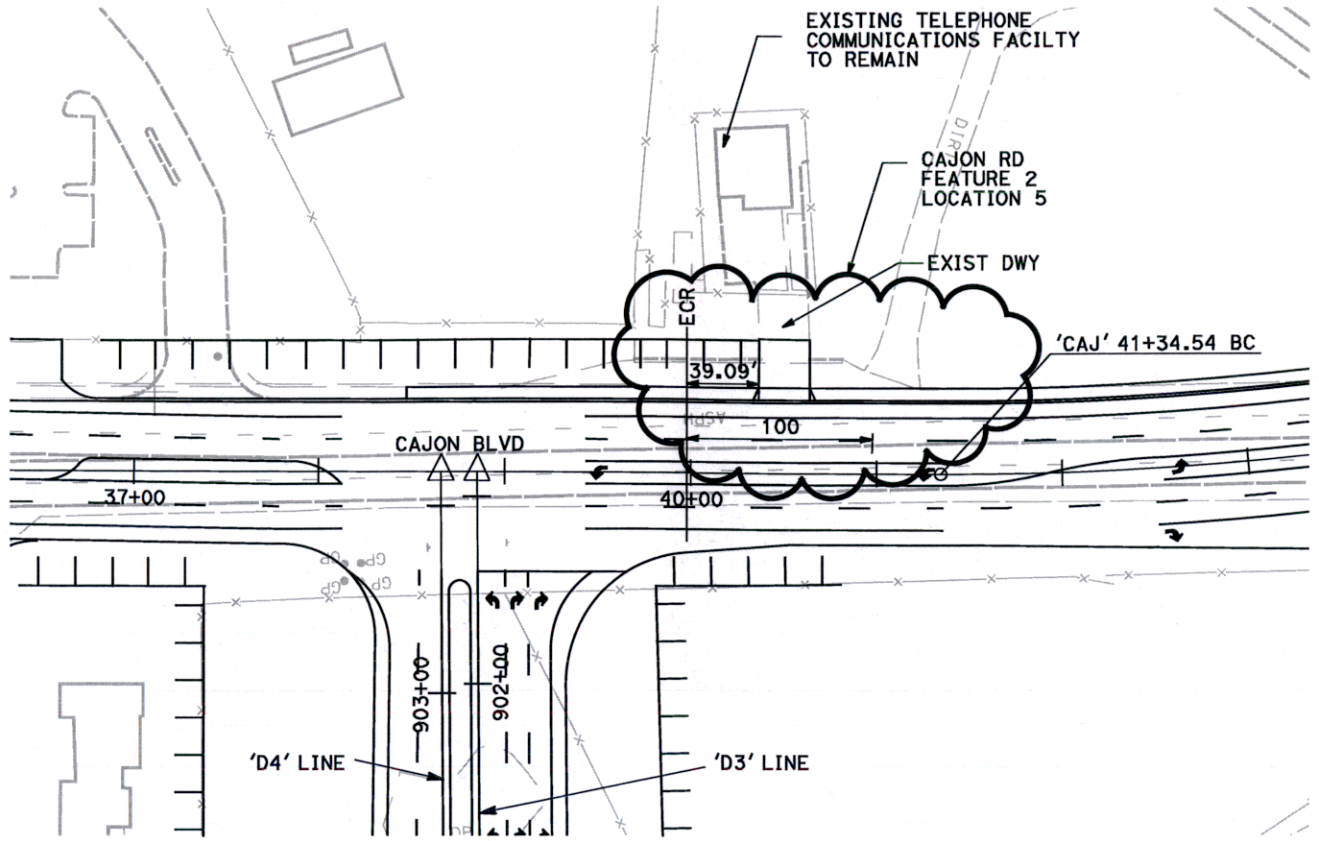
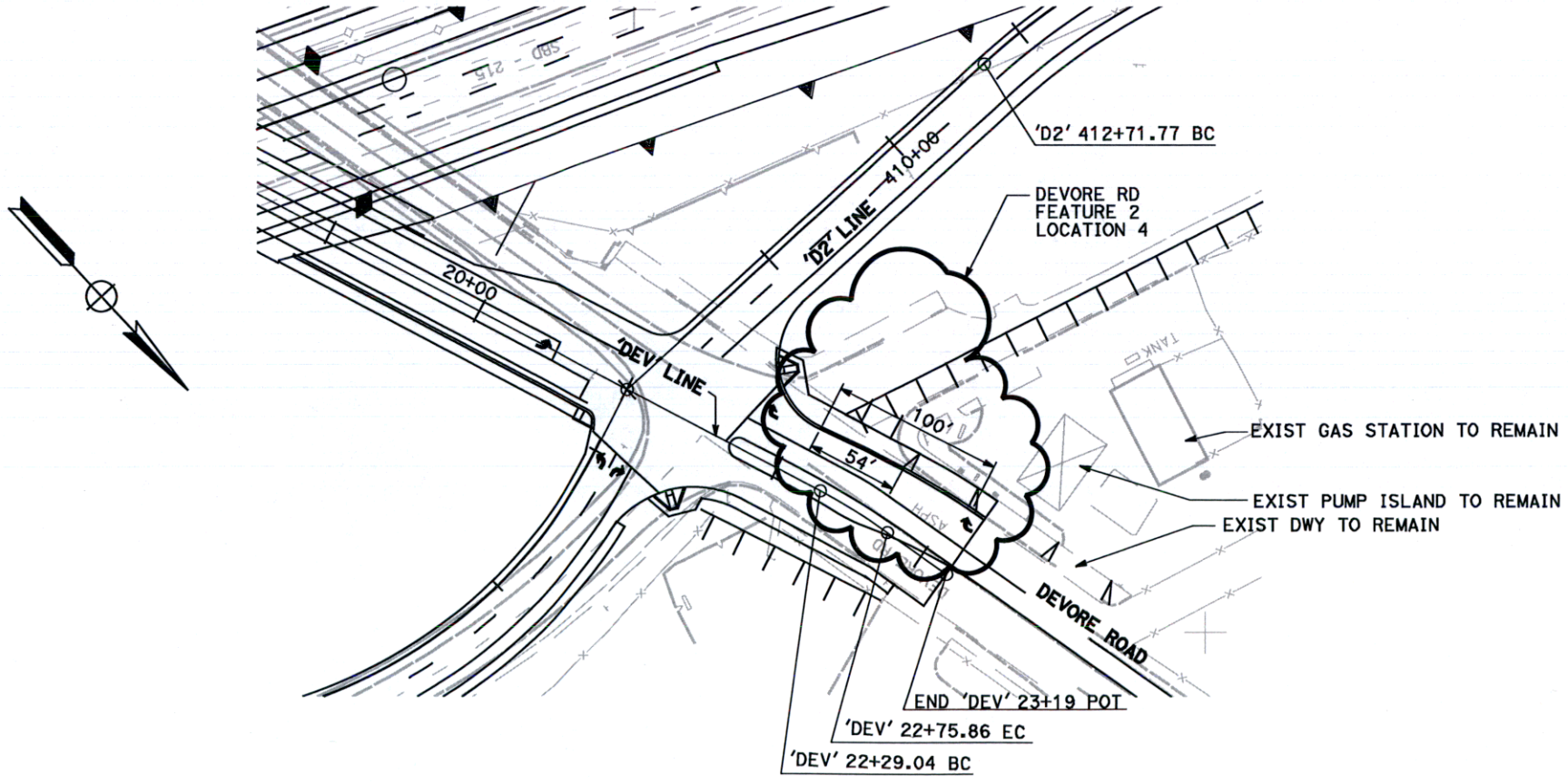
901 VIA PIEMONTE
5TH FLOOR
ONTARIO, CA 91764

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410





DEVORE ROAD FEATURE 2 LOCATION 4
CAJON ROAD FEATURE 2 LOCATION 5

ADVISORY DESIGN EXCEPTION ATTACHMENT 8

SCALE: NTS

REVISED BY | DATE REVISED

CALCULATED-DESIGNED BY | CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR

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LAST REVISION 00-00-00 | DATE PLOTTED => 1/16/2012 | TIME PLOTTED => 10:07:10 AM

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	14.0/16.4, 16.0/17.8		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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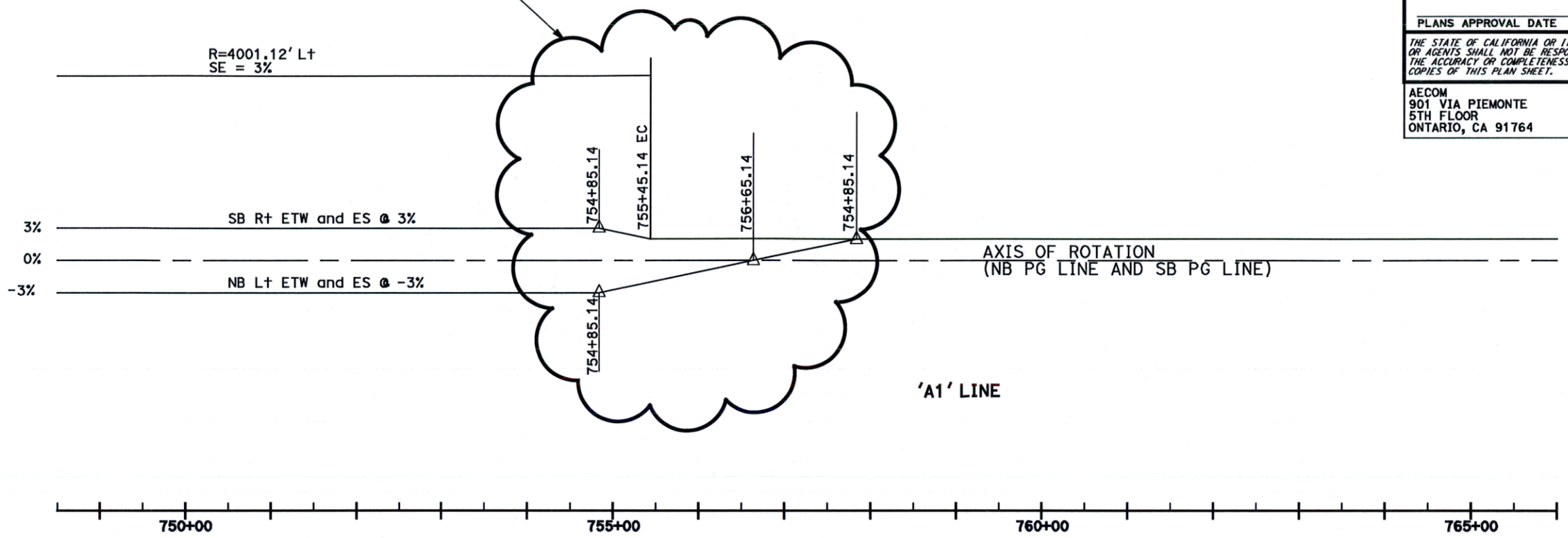
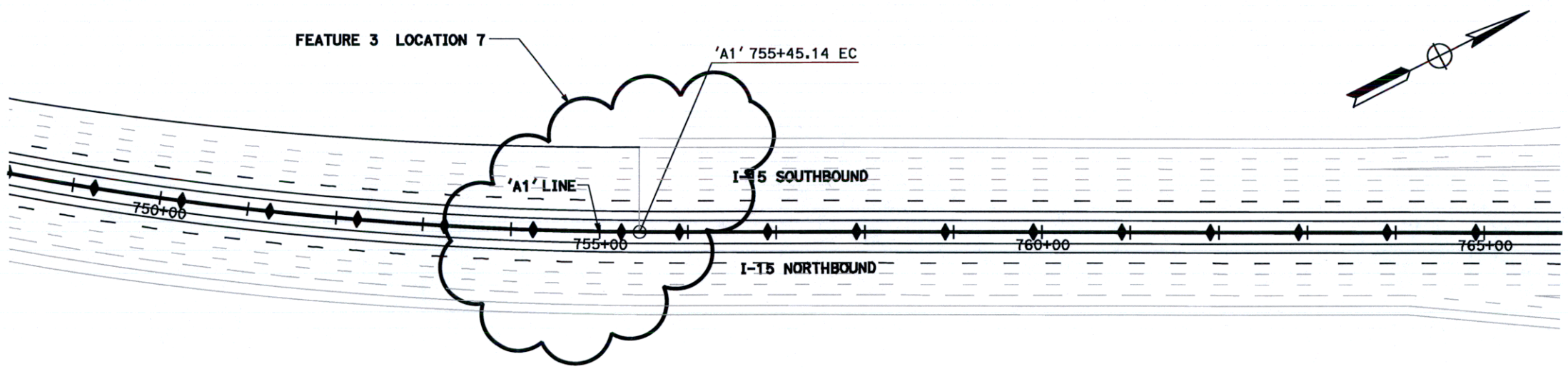
5TH FLOOR
ONTARIO, CA 91764

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

FEATURE 3 LOCATION 7





'A1' LINE FEATURE 3 LOCATION 7

ADVISORY DESIGN EXCEPTION ATTACHMENT 9

SCALE: NTS

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

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

LAST REVISION 00-00-00 | DATE PLOTTED => 1/16/2012 | TIME PLOTTED => 10:13:35 AM

Alt 3A Advisory 09.DGN 1/16/2012 10:13:35 AM

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => AECOM
DGN FILE => Alt 3A Advisory 09.DGN

EA 08-0K7100

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	14.0/16.4, 16.0/17.8		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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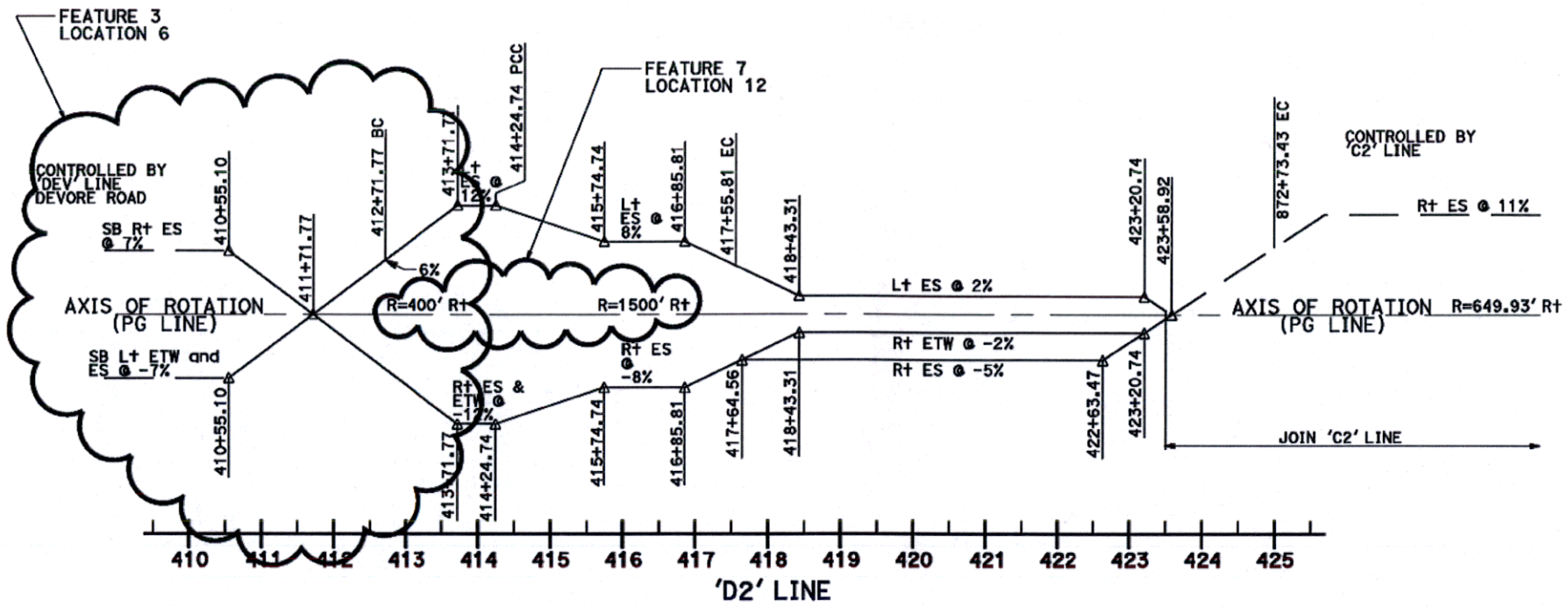
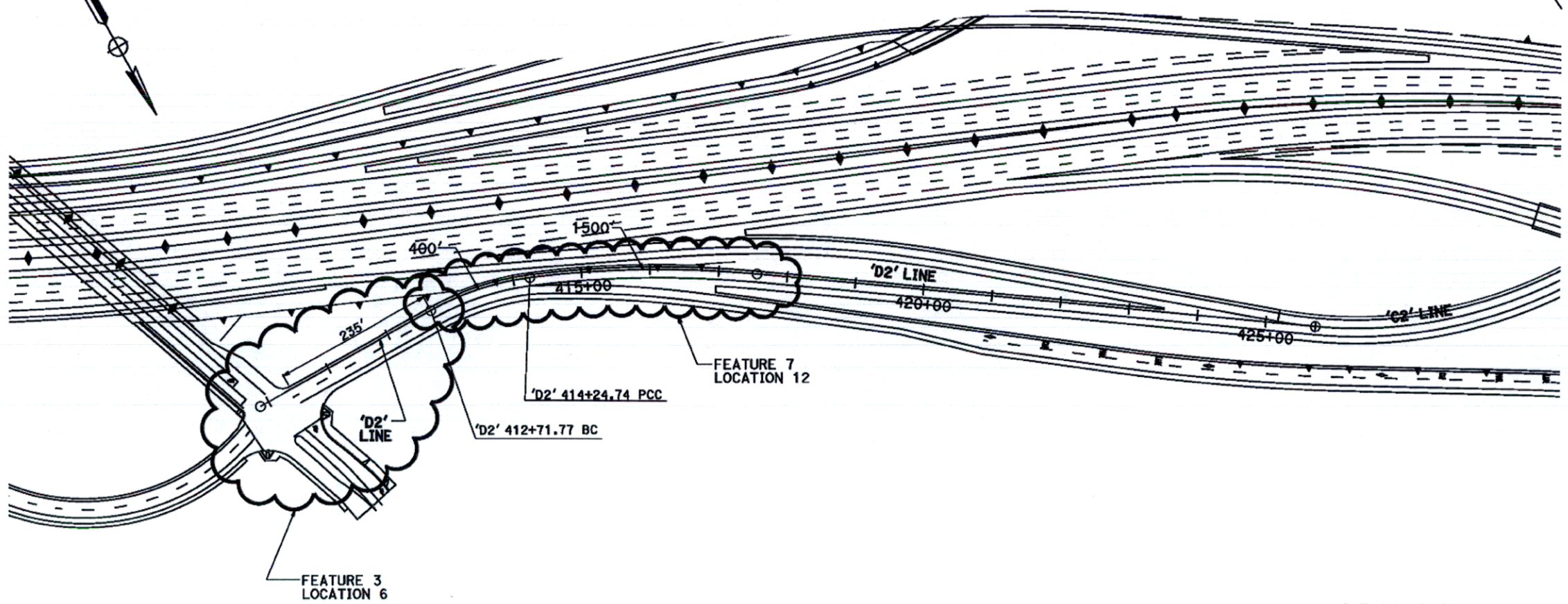
901 VIA PIEMONTE
5TH FLOOR
ONTARIO, CA 91764

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410





'D2' LINE FEATURE 3 LOCATION 6
'D2' LINE FEATURE 7 LOCATION 12

ADVISORY DESIGN EXCEPTION ATTACHMENT 10

SCALE: NTS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
CONSULTANT FUNCTIONAL SUPERVISOR
CALCULATED-DESIGNED BY
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DATE REVISED

LAST REVISION 00-00-00 DATE PLOTTED => 1/25/2012 TIME PLOTTED => 2:34:55 PM

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => AECOM
DGN FILE => Alt 3A Advisory 10.dgn

EA 08-0K7100

Alt 3A Advisory 10.dgn 1/25/2012 2:34:55 PM

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	14.0/16.4, 16.0/17.8		

REGISTERED CIVIL ENGINEER DATE

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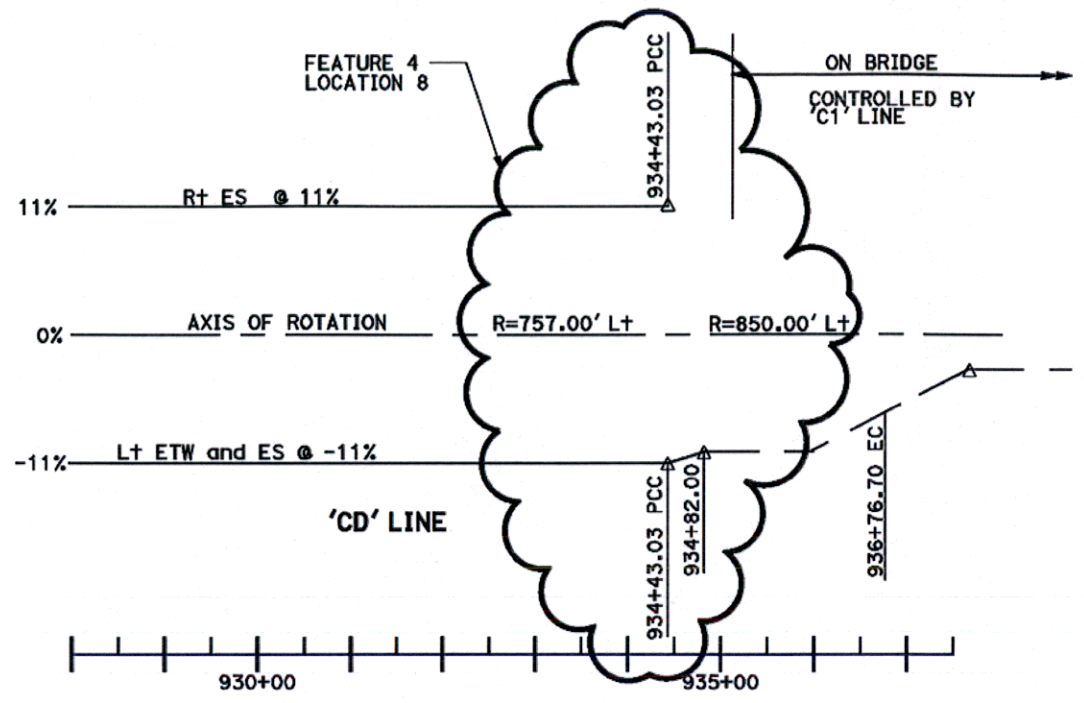
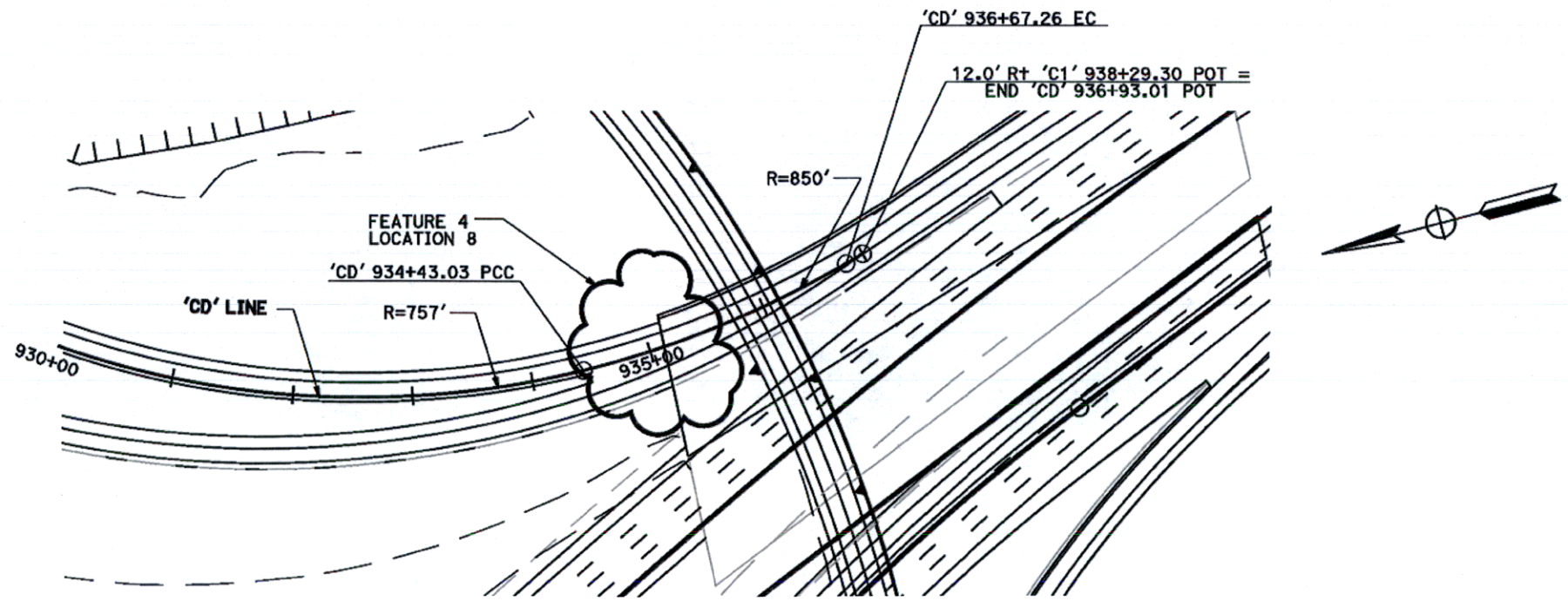
901 VIA PIEMONTE
5TH FLOOR
ONTARIO, CA 91764

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410





'CD' LINE
FEATURE 4 LOCATION 8

ADVISORY DESIGN EXCEPTION ATTACHMENT 11

SCALE: NTS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

CONSULTANT FUNCTIONAL SUPERVISOR

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LAST REVISION 00-00-00
DATE PLOTTED => 1/16/2012
TIME PLOTTED => 11:35:30 AM

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DGN FILE => Alt 3A Advisory 11.dgn

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	14.0/16.4, 16.0/17.8		

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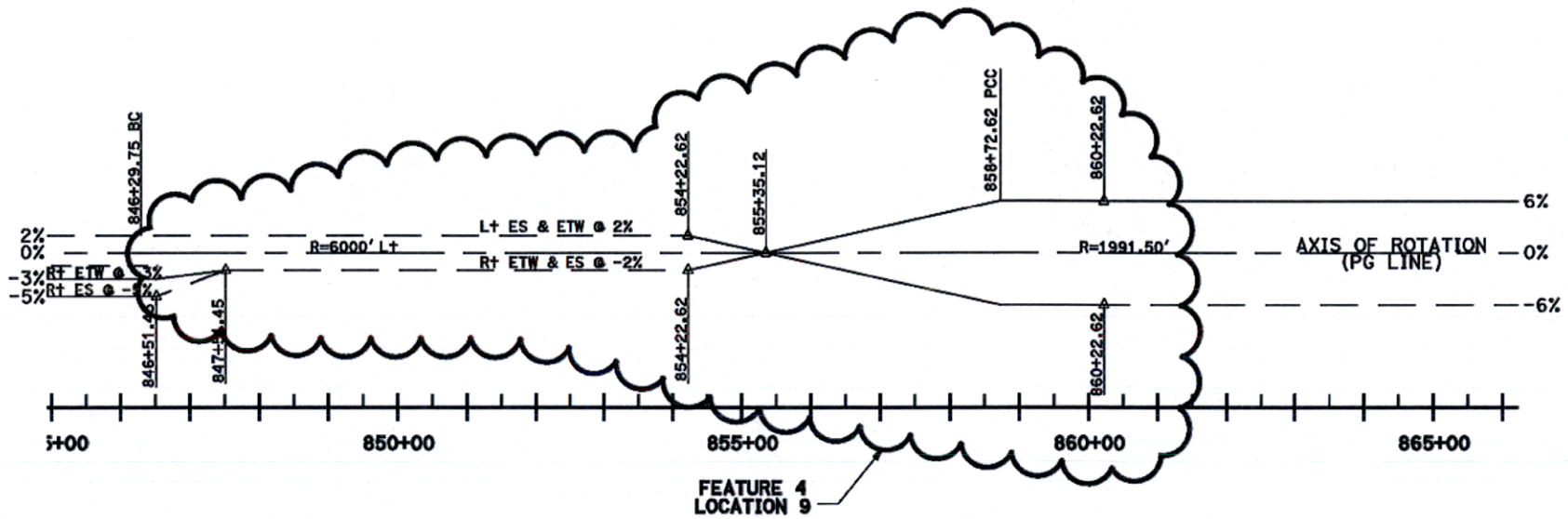
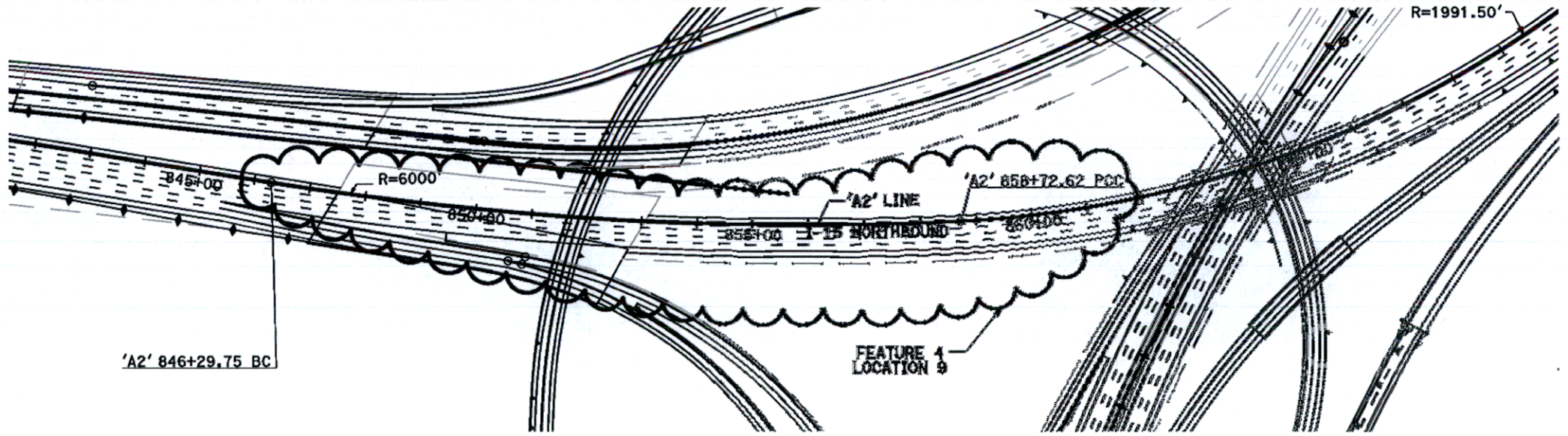
1170 W 3RD STREET
SAN BERNARDINO, CA 92410





'A2' LINE
FEATURE 4 LOCATION 9

ADVISORY DESIGN EXCEPTION ATTACHMENT 12

SCALE: NTS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

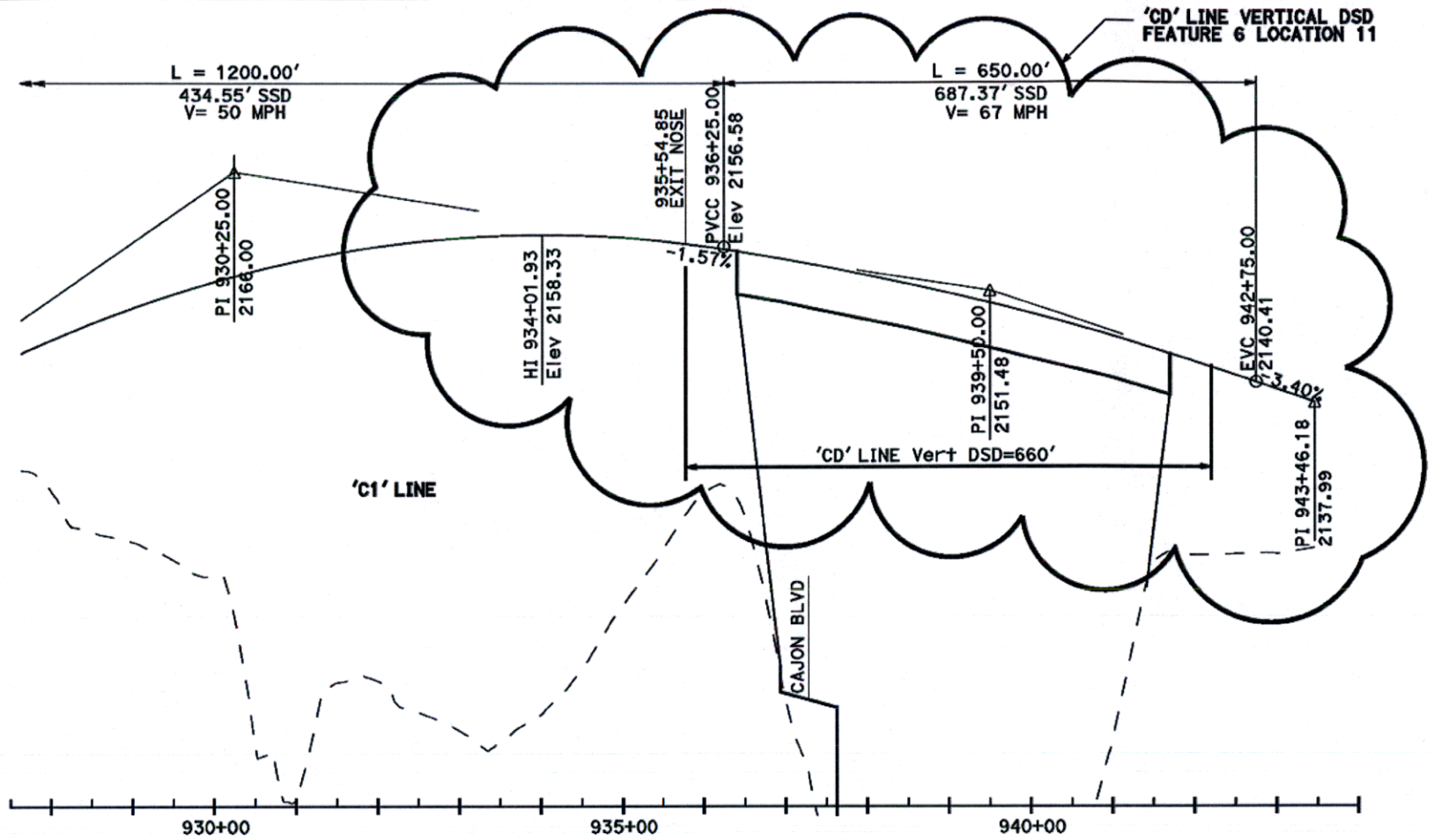
CONSULTANT FUNCTIONAL SUPERVISOR

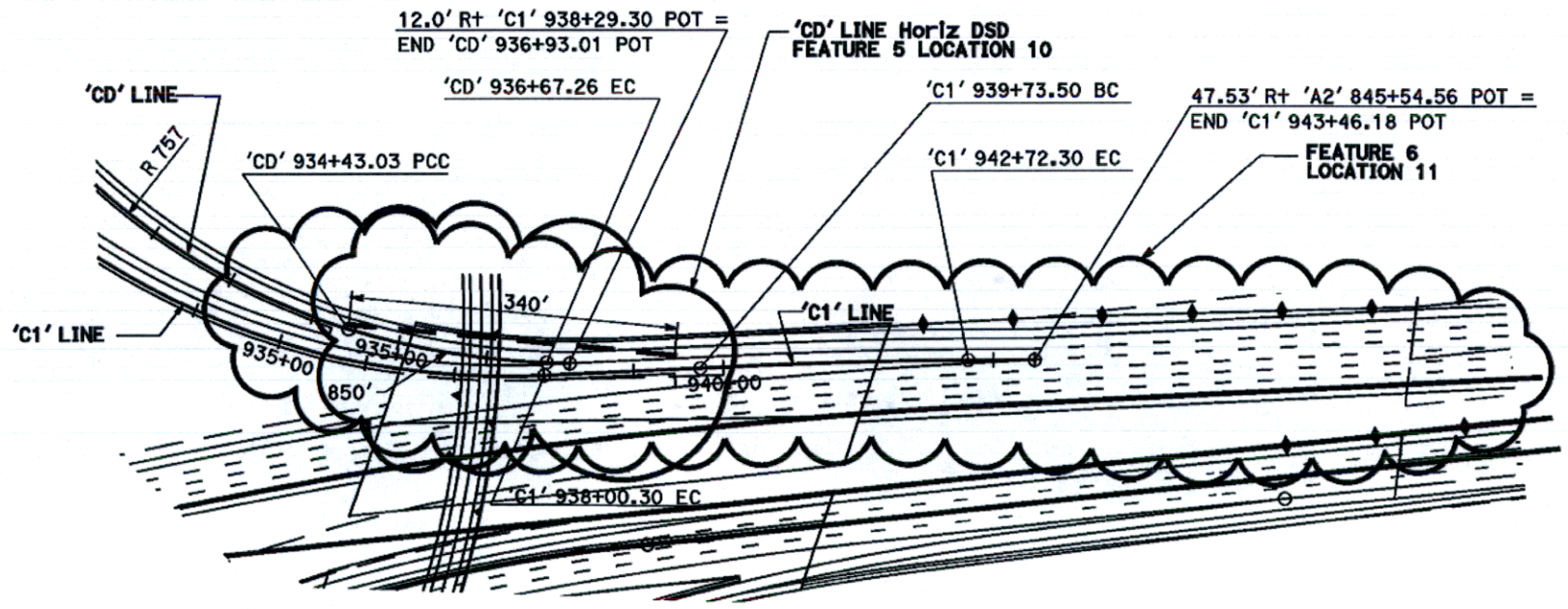
CALCULATED-DESIGNED BY

CHECKED BY

REVISED BY	DATE REVISED

LAST REVISION 00-00-00 DATE PLOTTED => 1/16/2012 TIME PLOTTED => 1:00:32 PM





'CD' LINE FEATURE 5 LOCATION 10
'C1' LINE FEATURE 6 LOCATION 11

ADVISORY DESIGN EXCEPTION ATTACHMENT 13

SCALE: NTS

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
08	SBd	15, 215	14.0/16.4, 16.0/17.8		

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 SCANNED COPIES OF THIS PLAN SHEET.

AECOM
901 VIA PIEMONTE
5TH FLOOR
ONTARIO, CA 91764

SANBAG
1170 W 3RD STREET
SAN BERNARDINO, CA 92410

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
CONSULTANT FUNCTIONAL SUPERVISOR
CALCULATED-DESIGNED BY
CHECKED BY
REVISED BY
DATE REVISED

LAST REVISION 00-00-00
DATE PLOTTED => 1/17/2012
TIME PLOTTED => 1:16:46 PM

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

USERNAME => AECOM
DGN FILE => Alt 3A Advisory 13.dgn

EA 08-0K7100

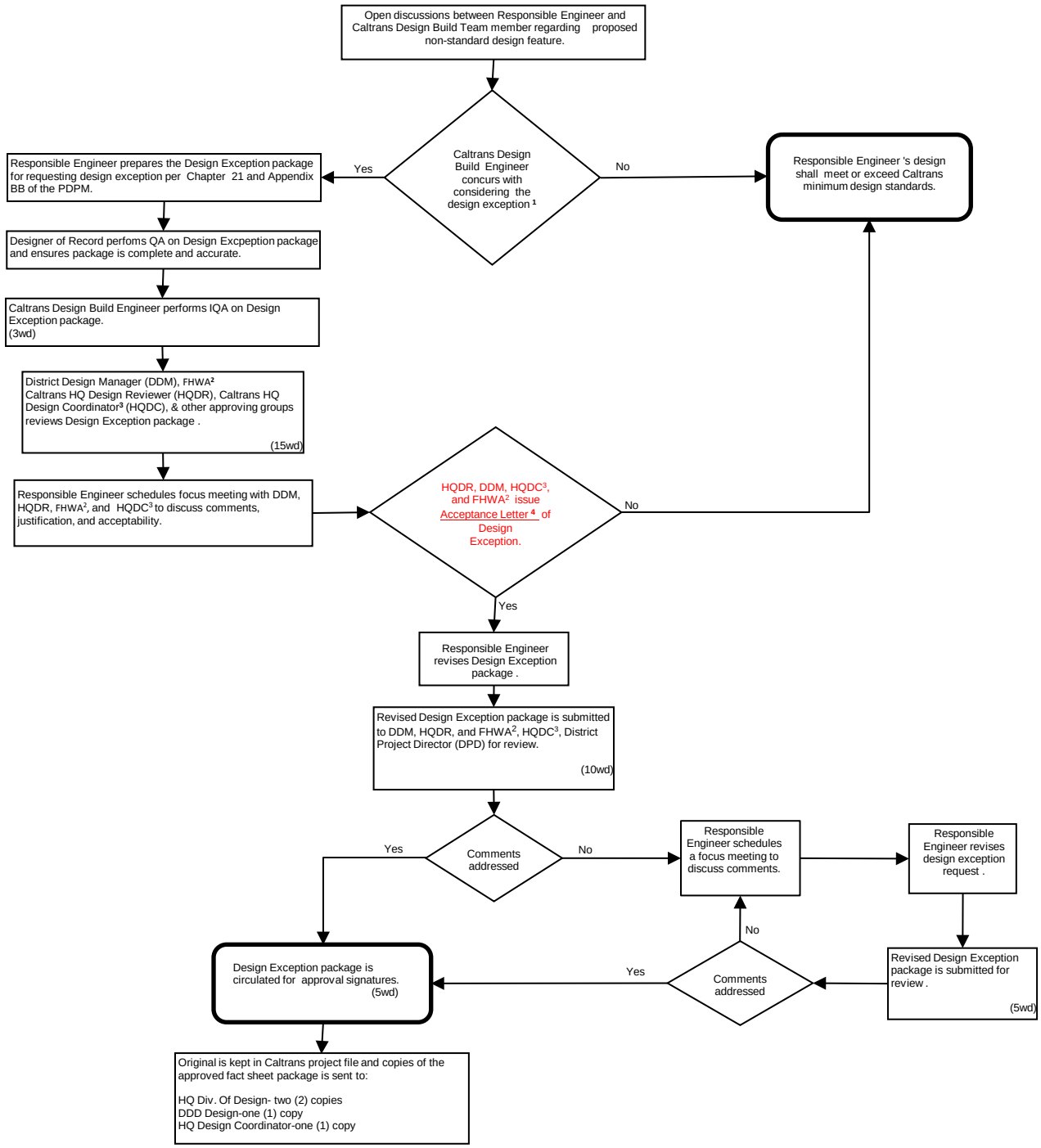
Alt 3A Advisory 13.dgn 1/17/2012 1:16:46 PM

EXHIBIT 11-E

Design Exception Process Flowchart

EXHIBIT 11-E: DESIGN EXCEPTION PROCESS FLOWCHART

For NON-STANDARDS DESIGN FEATURES



1 Concurrence to pursue with request for design exception DOES NOT GUARANTEE an acceptance will be issued. Design/Builder may continue to pursue design exception at their own risk.

2 FHWA review required only for design exceptions to the 13 controlling criteria (see Index 108.3 of the HDM) or if a vertical clearance of 16 feet over the Department of Defense Rural and Single Interstate Route system (see Section 309.2 of the HDM). Approximate review time is 30 workind days

3 Review & approval required for Mandatory and ADA design exceptions only.

4 Design Builder may implement the proposed non-standard feature as indicated in the design exception package and ensures that official approval will be granted following the formal review process. Final approval of design exception will be required prior to issuance of Acceptance of the Release for Construction Documents.

Note: Department does not control and therefore cannot guarantee the review times by third parties (i.e. FHWA).

EXHIBIT 12-A

District 8 Drainage Report Submittal Guidance

State of California
DEPARTMENT OF TRANSPORTATION

Business, Transportation and Housing Agency

M e m o r a n d u m

Flex your power!
Be energy efficient!

To: HIGHWAY DRAINAGE DESIGNERS
(Caltrans and Consultants)

Date: July 1,2010

From: JOHN ROGERS
Office Chief, Hydraulics

Subject: District 8 Drainage Report Submittal Guidance

The following is intended to help clarify what is expected regarding drainage report submittals and when in the development process these submittals should be provided. This is not all-inclusive or a design aid. Drainage design guidance can be found in chapter 800 of the Highway Design Manual (HDM).

FLOODPLAIN ANALYSIS

Any floodplain involvement will need to be identified during PA&ED. Chapter 17 of the Standard Environmental Reference (SER) and section 804 of the HDM will provide guidance. Hydrology and hydraulic calculations relative to the Preliminary Drainage Report may need to be performed at this early stage in support of a Location Hydraulic Study.

PRELIMINARY DRAINAGE REPORT

Very early in the PS&E phase an offsite drainage analysis (Preliminary Drainage Report) is to be developed. Some things to consider at this stage are:

- How old are the existing culverts, are they showing any signs of failure? All cross culverts within the project limits should have their inlets and outlets photographed, and the condition of the pipe material at these locations described (e.g. rebar showing for an RCP or perforations and rust for a CMP). This may require a little excavation with a shovel to expose the invert in some cases. Any laterals coming from the median should also have their outlets checked.

A strong flashlight could be used to examine the culvert. Any noticeable deformations (e.g. sagging soffit or failing joints) should be noted.

The presence of standing water should be investigated and noted, as this tends to speed up the corrosion process.

Based on what is discovered at the inlet and outlet, a more detailed investigation may be warranted. A suspect culvert should be remotely videoed, and this may require the culvert to be cleaned. Consult with Caltrans regarding any remote video needs.

Special consideration should be provided to the larger culverts, as they present the greatest threat to safety.

Design Information Bulletin No. 83 provides guidance for any necessary culvert rehabilitation. Any culverts found to be unsuitable for rehabilitation will need to be replaced.

- Will the proposed project change historical flow patterns? Care must be taken with any increase or diversions of flow. Are adjacent or nearby property owners being unreasonably impacted?

- What design year storm should you analyze? Potential hydraulic upgrades to existing facilities should be discussed per sections 803.3 and 818.2 of the HDM. Field maintenance personnel should be consulted regarding any existing flooding problems. Design year determination for new roadways should follow sections 818.2 and 821.3 of the HDM.

FINAL DRAINAGE REPORT

This report will provide onsite (roadway) analysis and be added to the Preliminary Drainage Report data. This analysis is very sensitive to any changes to the design and therefore cannot be finalized prior to 100% PS&E. Roadway drainage should adhere to section 830 of the HDM. Some onsite roadway drainage items of particular concern are:

- Determining the time of concentration. Because the minimum time of concentration is 5 minutes, and that this value is a governing factor for most pavement drainage scenarios, we have developed an Excel spreadsheet "On-Drain" for ease of calculation and review. Please contact D8 Hydraulics at (909) 383 – 4555 or 6059 for an electronic copy.

- Most existing inlet spacing was based on a minimum time of concentration of 10 minutes. This spacing may no longer be adequate, particularly with inside widening that eliminates median (valley) drainage.

- Consideration of steeper cross slopes should be given to outside widening per section 833.2 of the HDM.

- Allowable design water spread should follow table 831.3 of the HDM. Consideration must also be given to the height of dike, as overtopping may be the governing factor.

- The proposed use of scuppered barrier or slotted pipe should be discussed with the Hydraulic Unit early in the design process. Their use is limited and maintenance can be difficult.

GENERAL

The Final Drainage Report should incorporate the following qualities:

- It should be easy to understand and follow. There must be a narrative that describes the existing condition and what effect the proposed improvements will have on these existing conditions. Pertinent information shall be summarized. Computer printout calculations support the narrative and should be well organized and only what is needed.

- Mapping is very important. Drainage boundaries should be clearly marked and preferably colored. Large offsite maps should be folded and placed in a pocket so they can be removed for reference. Existing features shall be dashed and/or faded with proposed features solid. Roadway stationing should be provided as well as labeling of local streets. Maps should be of a scale that allows the reviewer to clearly read all labeling, follow all flow paths and distinguish all boundaries. Design layout sheets are typically used for onsite drainage mapping.

Once again, the preceding information is provided for guidance with transportation related drainage submittals to District 8 and is not a blueprint on how to compile a drainage report. Highway projects vary in scope and complexity and so will drainage reports. It is assumed that the report will have a proper format, one that has a table of contents and is clearly and logically organized and one that contains the professional stamp of the responsible engineer. Adherence to this guidance will help in the production of a quality document and help to insure a quick review turn around.

Please provide an electronic .pdf copy once final report has been approved.

EXHIBIT 12-B

Proposed Treatments for Existing Culverts

Exhibit 12-B: Proposed Treatments for Existing Culverts

Table 1: I-15 - Existing Culvert Conditions				
SYSTEM NO.(1)	**PM**	**Treatment Location at/between Node(s):**	**PROPOSED TREATMENTS**	**Picture Name (2)**
2	13.99	1	Regrade Channel Clear Outlet (Outlet blocked)	DSC06549.jpg
3	14.00	1	Regrade Channel (streambed above flow line of culvert) Repair/Replace Outlet (outlet end crushed)	DSC06661.JPG
5	14.13	1	Clear Channel (Outlet blocked by sediment and vegetation)	DSC06626.JPG
6	14.18	1	Clear Channel (vegetation blocking channel)	DSC06560.JPG
7	14.19	1	Clear Outlet (Vegetation obstructing outlet)	DSC06564.JPG
10	14.34	1	Install Rip Rap at Outlet (erosion at outlet)	DSC06667.JPG
		1→2	Install Pipe Liner	DSC06668.JPG
14	14.63	1	Clear Channel	DSC06677.JPG
		5	Clear Inlet (debris and vegetation at inlet)	DSC06593.JPG
		2→3	Install Pipe Liner	DSC06678.JPG
		3→4	Install Pipe Liner	DSC06591.JPG
17	14.74	1	Clear Channel (channel obstructed by vegetation)	DSC06359.JPG
		3	Clear Inlet (inlet channel obstructed by vegetation)	DSC06365.JPG
18	14.75	2	Repair/Replace Inlet (concrete broken, lid missing)	DSC06639.JPG
19	14.75	1	Fill Erosion, Stabilize Channel and Slope (critical erosion, 8' drop, culvert projecting 10')	DSC06383.JPG
20	14.76	1	Repair Channel and Slope (extensive slope and channel erosion)	DSC06367.JPG
21	14.76	1	Clear Channel (channel obstructed by vegetation)	No Photo
		19	Repair/Replace lid (lid bent)	No Photo
		22	Flush Inlet (Inlet blocked by sediment)	No Photo
		3→16	Install Pipe Liner (moderate rust and invert thinning at the median culverts)	No Photo
		16→17	Install Pipe Liner (moderate rust and invert thinning at the median culverts)	No Photo
		17→18	Install Pipe Liner (moderate rust and invert thinning at the median culverts)	No Photo
		18→19	Install Pipe Liner (moderate rust and invert thinning at the median culverts)	No Photo
		19→20	Install Pipe Liner (moderate rust and invert thinning at the median culverts)	No Photo
		20→21	Install Pipe Liner (moderate rust and invert thinning at the median culverts)	No Photo
		21→22	Install Pipe Liner (moderate rust and invert thinning at the median culverts)	No Photo
23	15.71	1	Regrade Channel and Remove Debris (Outlet blocked by sediment)	DSC06525.JPG
		3	Clear Inlet (remove vegetation)	DSC06528.JPG
25	15.96	1	Regrade Channel (Outlet blocked by sediment)	DSC06502.JPG
		2	Clear Channel	DSC06522.JPG
		3	Regrade Channel (Inlet blocked by sediment)	DSC06532.JPG
26	R16.36	1	Clear Outlet (outlet blocked)	No Photo
		5	Replace Grate (bicycle grate missing)	No Photo
31	R14.32	4	Clear Inlet (large amount of trash blocking inlet)	DSC06090.JPG

32	R14.57	3	Clear Inlet (heavy vegetation at inlet)	DSC06015.JPG
		1→2	Pave Invert (moderate abrasion of invert)	DSC06025.JPG
33	R14.86	5	Flush Inlet (inlet blocked by sediment)	DSC06031.JPG
		2→3	Flush Culvert (inlet blocked by sediment)	No Photo
		3→7	Flush Culvert (inlet blocked by sediment)	DSC06037.JPG
		2→6	Install Pipe Liner (holes and rust present at the invert)	DSC06038.JPG
34	R14.92	2	Flush Inlet (trash and sediment present at the inlet)	DSC06066.JPG
36	R15.08	1→2	Pave Invert (holes throughout invert)	DSC06044.JPG
37	R15.16	3	Clear Inlet (debris at inlet)	DSC06152.JPG
39	R15.68	1→2	Install Pipe Liner (light rust at the invert)	DSC06144.JPG
40	R15.85	1→2	Pave Invert (significant scouring [6-8"] of invert) rebar and metal showing	DSC06150.JPG
41	R15.98	3	Clean Debris Rack and Regrade Channel	IMG_0833.JPG
42	R16.15	2	Remove Vegetation and Regrade Channel	No Photo
43	R16.29	3	Clean Debris and Regrade Channel	DSC06004.JPG
45	R16.47	2	Clear Debris and Vegetation from Debris Rack	IMG_0841.JPG
46	R16.48	1→2	Install Pipe Liner (poor joint 20' from outlet causing erosion under culvert)	IMG_0839.JPG

(1) See attached aerial photos

(2) Photos provided as Reference Information Documents (RID)

Table 2: I-215 - Existing Culvert Conditions

SYSTEM NO.(1)	PM	Treatment Location at/between Node(s):	PROPOSED TREATMENTS	Picture Name (2)
3	17.35	2	Replace Lid (Lid missing) Clear Debris and Vegetation (inlet full of debris)	DSC05958.JPG
5	17.61	7	Repair Grate	No Photo
		12	Replace Head Wall (severe scour)	DSC05898.JPG
		1→2	Pave Invert (scour and holes in bottom of the culvert	DSC05889.JPG
		2→9	Pave Invert (scour of invert paving – metal showing)	DSC05892.JPG
		7→8	Pave Invert (scour and holes in bottom of the culvert	DSC05878.JPG
		3→10	Pave Invert (scour of invert paving – metal showing)	DSC05893.JPG
		10→12	Pave Invert (culvert bottom is coming apart, holes and major scouring)	DSC05897.JPG
		13→14	Pave Invert (scour and large holes in bottom of the culvert, invert paving is breaking up, and rails dislodged)	DSC05900.JPG
		14→15	Pave Invert (scour and large holes in bottom of the culvert, invert paving is breaking up, and rails dislodged)	DSC05906.JPG

(1) See attached aerial photos

(2) Photos provided as Reference Information Documents (RID)

ROUTE 15 SYSTEM #1
PM 13.81

ROUTE 15 SYSTEM #2
PM 13.99

ROUTE 15 SYSTEM #3
PM 14.00

ROUTE 15 SYSTEM #4
PM 14.12

ROUTE 15 SYSTEM #5
PM 14.13

ROUTE 15 SYSTEM #6
PM 14.18

ROUTE 15 SYSTEM #7
PM 14.19

14.0

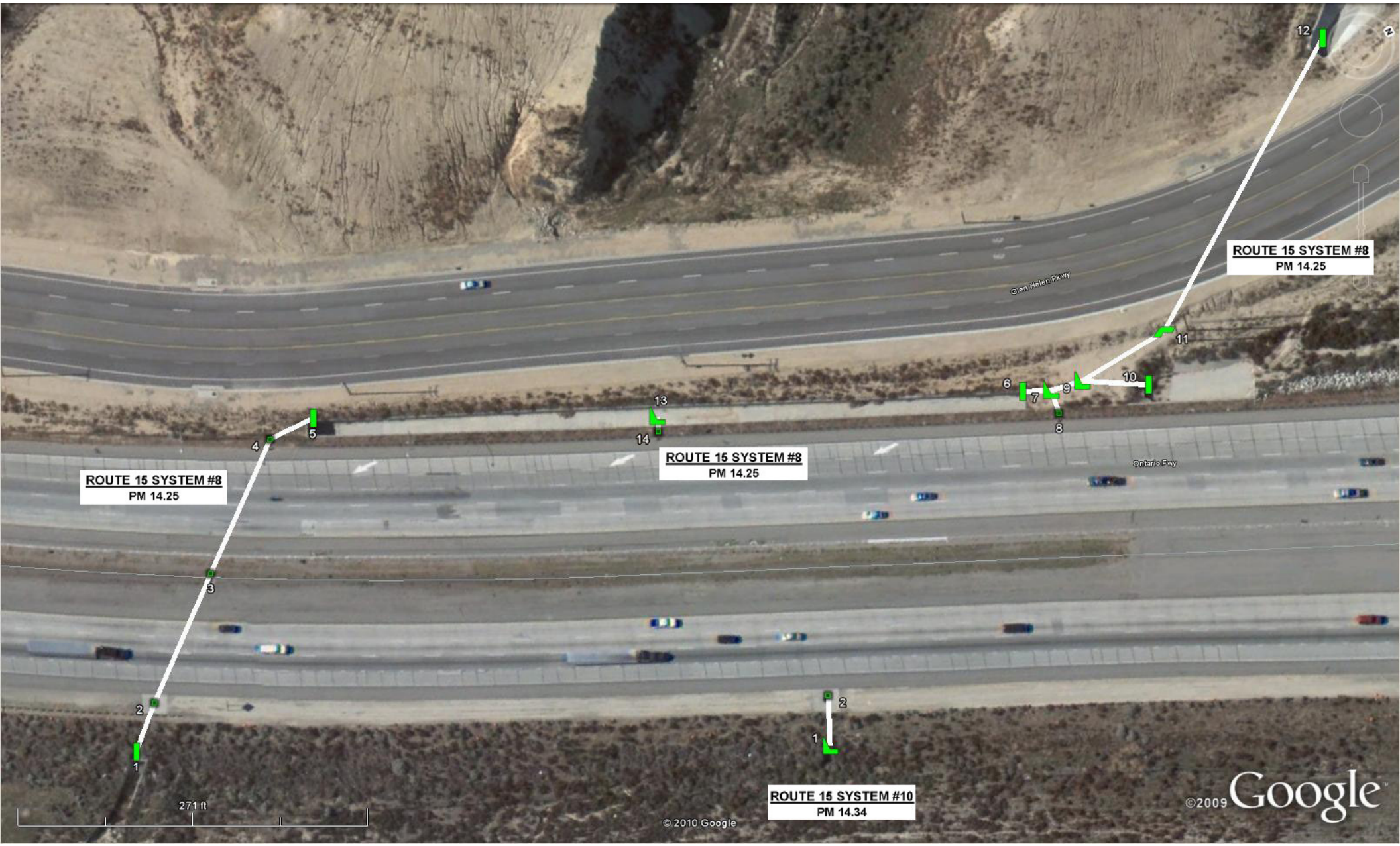
Glen Helen Pkwy

Ontario Fwy

15

469 ft

© 2010 Europa Technologies
© 2010 Google
©2009 Google


ROUTE 15 SYSTEM #8
PM 14.25
ROUTE 15 SYSTEM #8
PM 14.25
ROUTE 15 SYSTEM #8
PM 14.25
ROUTE 15 SYSTEM #10
PM 14.34
Glen Helen Pkwy
Ontario Fwy
271 ft
© 2010 Google
©2009 Google

ROUTE 15 SYSTEM #11
PM 14.46
ROUTE 15 SYSTEM #13
PM 14.55
ROUTE 15 SYSTEM #15
PM 14.68
ROUTE 15 SYSTEM #16
PM 14.70
ROUTE 15 SYSTEM #18
PM 14.75
ROUTE 15 SYSTEM #12
PM 14.50
ROUTE 15 SYSTEM #14
PM 14.63
ROUTE 15 SYSTEM #17
PM 14.74
Ontario Fwy
15
14.5
476 ft
© 2010 Google
©2009 Google

ROUTE 15 SYSTEM #21
PM 14.76
ROUTE 15 SYSTEM #21
PM 14.76
ROUTE 15 SYSTEM #20
PM 14.76
ROUTE 15 SYSTEM #19
PM 14.75
ROUTE 15 SYSTEM #20
PM 14.76
15
779 ft
© 2010 Google
©2009 Google

ROUTE 15 SYSTEM #24
PM 15.90

ROUTE 15 SYSTEM #22
PM 15.61

ROUTE 15 SYSTEM #23
PM 15.71

ROUTE 15 SYSTEM #25
PM 15.96

15.5

16.0

Ontario Fwy

Mojave Fwy

Glen Helen Rd

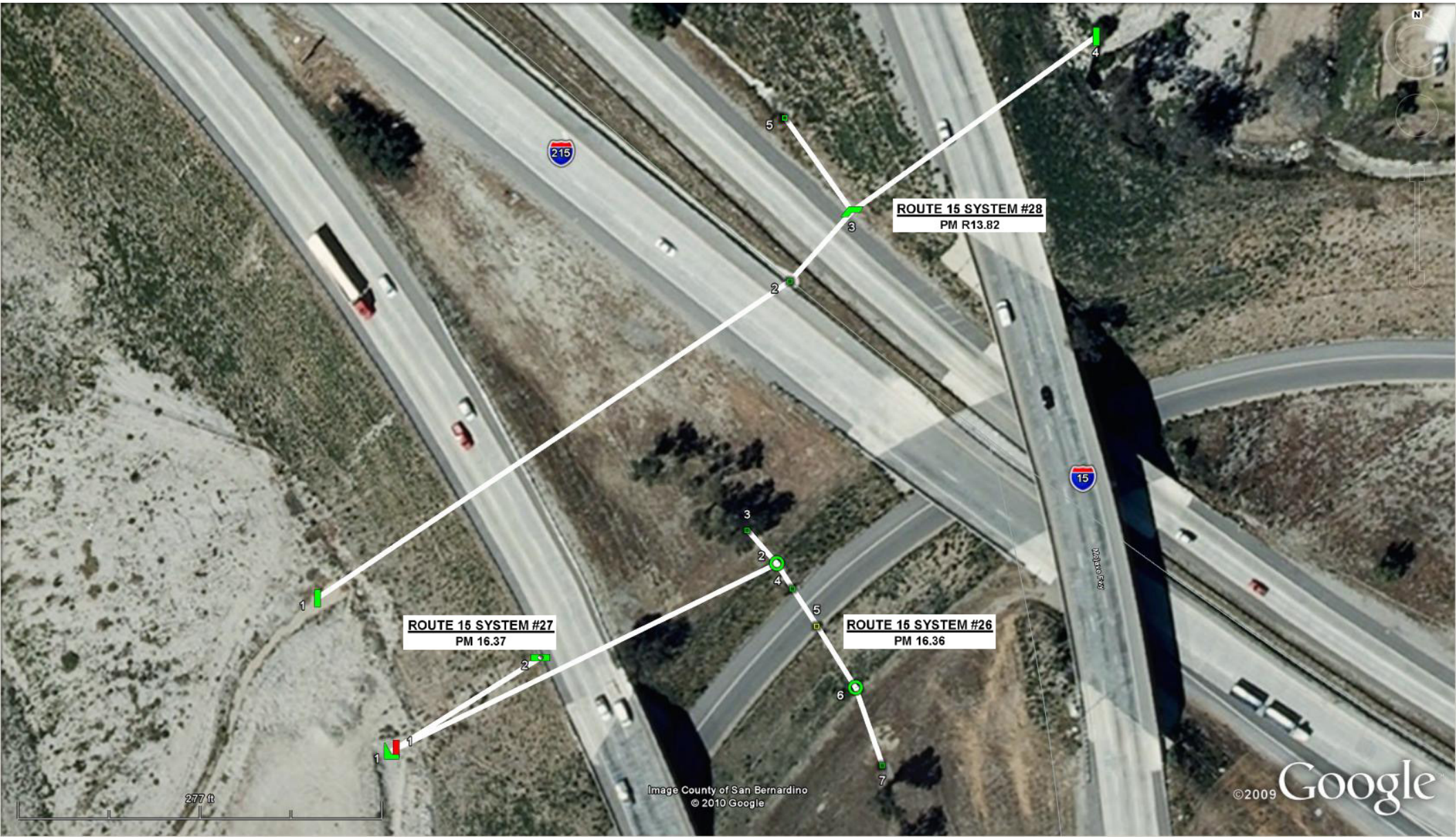
Cajon Blvd S

15

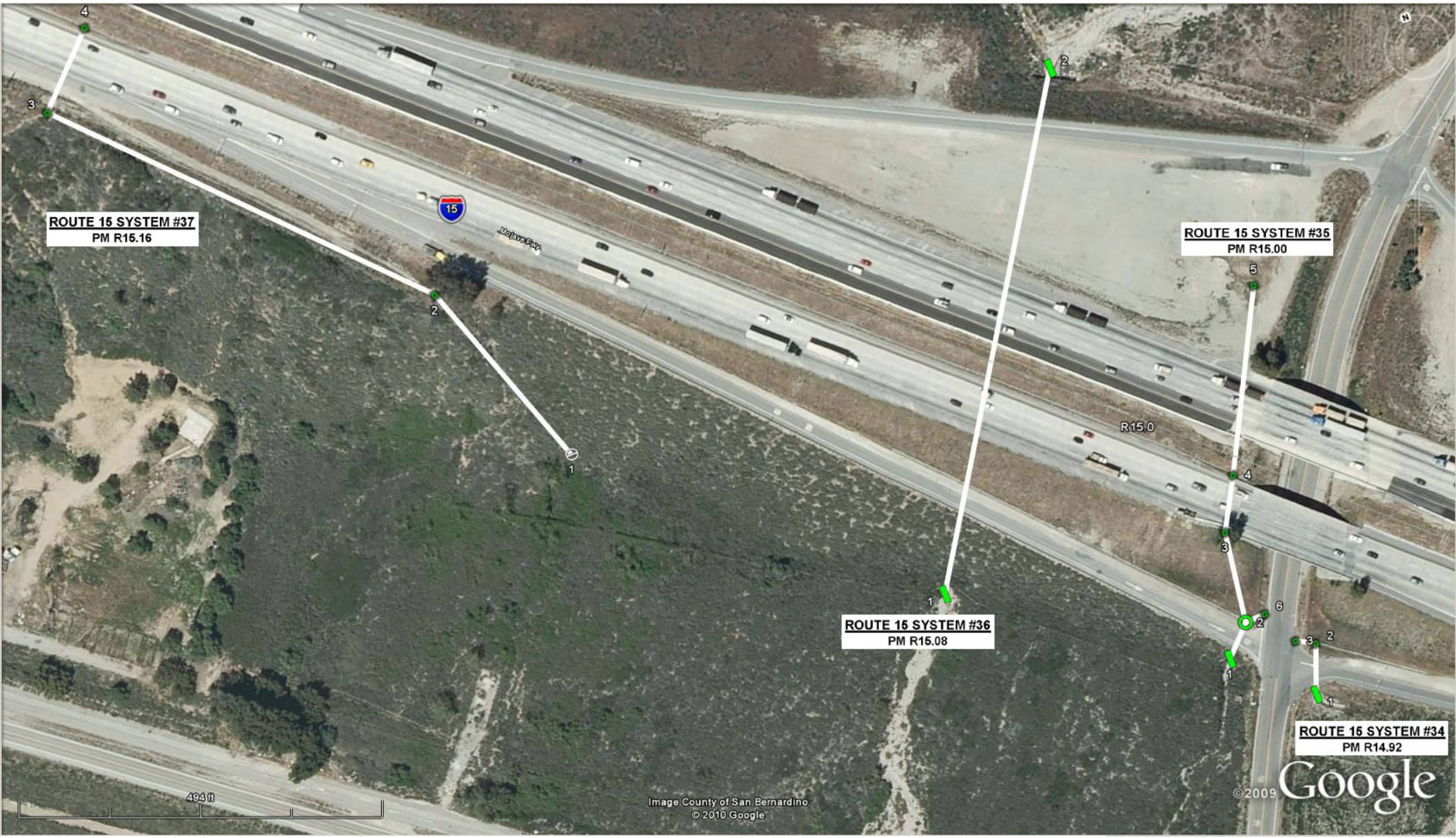
1193 ft

Image County of San Bernardino
© 2010 Google

©2009 Google


ROUTE 15 SYSTEM #28
PM R13.82
ROUTE 15 SYSTEM #27
PM 16.37
ROUTE 15 SYSTEM #26
PM 16.36
215
15
Mojave Fwy
277 ft
Image County of San Bernardino
© 2010 Google
©2009 Google

ROUTE 15 SYSTEM #33
PM R14.86
ROUTE 15 SYSTEM #32
PM R14.57
ROUTE 15 SYSTEM #31
PM R14.32
ROUTE 15 SYSTEM #30
PM R14.13
ROUTE 15 SYSTEM #29
PM R14.00
R14.5
R14.0
Hillcrest Dr
Rimhurst Dr
Windsor Ave
Nedlee Ave
Kimbark Ave
Riverside Fwy
15
215
1314 ft
Image County of San Bernardino
© 2010 Google
© 2010 Europa Technologies
©2009 Google


ROUTE 15 SYSTEM #37
PM R15.16
ROUTE 15 SYSTEM #36
PM R15.08
ROUTE 15 SYSTEM #35
PM R15.00
ROUTE 15 SYSTEM #34
PM R14.92
R15.0
Mojave Fwy
494 ft
Image County of San Bernardino
© 2010 Google
©2009 Google

ROUTE 15 SYSTEM #42
PM R16.15
ROUTE 15 SYSTEM #41
PM R15.98
ROUTE 15 SYSTEM #40
PM R15.85
ROUTE 15 SYSTEM #39
PM R15.68
ROUTE 15 SYSTEM #38
PM R15.57
R16.0
R15.5
Mojave Fwy
Ranch Rd
Yates Gulch Rd
15
1102 ft
© 2010 Google
© 2010 Europa Technologies
Image County of San Bernardino
©2009 Google

ROUTE 15 SYSTEM #46
PM R16.48
ROUTE 15 SYSTEM #45
PM R16.47
ROUTE 15 SYSTEM #44
PM R16.30
ROUTE 15 SYSTEM #43
PM R16.29
ROUTE 15 SYSTEM #47
PM R16.52
R16.5
Mojave Fwy
15
611 ft
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© 2010 Europa Technologies
Image County of San Bernardino
©2009 Google

ROUTE 215 SYSTEM #5
PM 17.61
ROUTE 215 SYSTEM #4
PM 17.43
ROUTE 215 SYSTEM #3
PM 17.35
ROUTE 215 SYSTEM #2
PM 17.22
ROUTE 215 SYSTEM #1
PM 17.11
17.5
881 ft
Nedlee Ave
Grandview Ave
Santa Fe Ave
Marion Ave
Arrowhead Blvd
Commerce
Riverside Fwy
Mayes Rd
Image County of San Bernardino
© 2010 Google
©2009 Google

EXHIBIT 12-C

District 8 Drainage Report Format

EXHIBIT 12-C

PRELIMINARY / FINAL DRAINAGE REPORT FORMAT

Preliminary Drainage Report should be completed with PR, PSR, & PSSR
Final Drainage Report shall be completed with 95% PS&E

Note: for less complex projects the report may be a title and summary on one page

TITLE PAGE

- Co – Rte – PM
- Project Description, EA, Date
- Signature of Engineer in responsible charge

LOCATION MAP

TABLE OF CONTENTS

INTRODUCTION

- A brief statement of the type of improvement proposed

SUMMARY

- A general discussion of the scope of the drainage work on the project including but not limited to:
  - Any waterways within the project limits and their associated floodplains
  - Status of historical drainage issues
  - Hydrology and basin characteristics
  - Rainfall to be used
  - Drainage patterns that have been changed
  - Methodologies used in computing runoff
  - Storm water and erosion control strategies
  - Problems of debris, sedimentation, scour, and bank protection
  - Future facilities and development – how will they affect runoff?
  - Condition of existing facilities
  - Effect of bedload on discharge in undeveloped areas
  - Groundwater
  - Local agency involvement? Flood control improvements? Is coordination necessary?
  - Unusual and special conditions – will drainage easements be needed
  - Reference data such as previous drainage reports and miscellaneous correspondence
  - Identify preliminary locations of bridges and give waterway and freeboard requirements

The following categories may or may not apply depending on the project situation:

ATTACHMENTS

- *WATERSHED (Drainage) MAP(S)*
  - Contours
  - Delineated areas contributing to different inlets and/or crossdrains with C, A, and T_c
  - Points of concentration and outfalls
  - Soil characteristics (may be shown on a separate map)

- *INTENSITY – DURATION – FREQUENCY CHART*
  - Based on San Bernardino or Riverside County Hydrology methodology

- *PHOTOS*
  - Include photos of unusual conditions

- *TABLE OF DESIGN FLOWS, VELOCITIES, AND DEPTHS*
  - Crossdrains: available headwater, headwater, Q, outlet velocity
  - Channels: Q, V, Depths

- *TABLE OF INTERCEPTION, BYPASS, SPREAD*
  Request "On-Drain" spreadsheet

- *HGL TABLE OR PROFILE FOR NETWORKS*

- *DRAINAGE CALCULATIONS*
  - Careful attention should be paid in determining the correct return period to be used in all drainage calculations. Refer to the Highway Design Manual (6th edition) (HDM) topics 803.3 and 818.2 for existing facilities, and topics 818.2, 821.1, 821.3, 831.1, and 831.3 for proposed facilities.
  - Hydrology calculations shall be done in conformance with the HDM and either the SBCFCD Hydrology Manual or the RCFCWCD Hydrology Manual, as appropriate.
  - Hand and/or computer software (such as Haestad Methods, or CIVILDESIGN) calculations are both acceptable.
  - Inlet performance and shoulder hydraulic capacity calculations shall be performed using the procedures outlined in the FHWA publication "Hydraulic Engineering Circular No. 22" (obtain "On-Drain" spreadsheet from Hydraulic Unit to simplify). Culvert headwater shall be calculated using the procedures outlined in the FHWA publication "Hydraulic Design Series No. 5". The designer should refer to Chapter 800 of the HDM for procedures and/or Caltrans standards in designing other drainage features.
  - Calculations must be complete in providing and substantiating all data and assumptions used in calculating the resulting flow rates and/or hydrographs. All calculations must accurately model the appropriate conditions that are the contributing factors.
  - All proposed pipes and channels shall be shown in profile with the hydraulic grade line, energy grade line, design peak flow rate, and design return period shown on the plans. A sufficient reach of existing facilities (to which proposed facilities will be connected) must be shown that would accurately depict their adequacy.
  - All drainage calculations (hand calculations and computer runs) are to be considered "backup" material to accompany the drainage report. The "backup" material of the drainage report must not be confused for or considered to be a substitute for the summary, tables, charts, maps, photos, etc. It will be unacceptable if this office has to search through the calculations to determine the intent of the engineer.

The above material shall be bound and a copy sent to the Office of Hydraulics for review. One copy of the final report will be kept on file in the Office of Hydraulics and another will be kept with the project file. An electronic. pdf copy is also requested for submittal once the report is approved.

EXHIBIT 13-A

Bridge Structure Depth - Minimum Requirements

EXHIBIT 13-A

Bridge Structure Depth- Minimum Requirements

STRUCTURAL SECTION	(STR. DEPTH / MAX SPAN)		COMMON SPAN RANGE **feet**
	SIMPLE	CONTINUOUS	
RC SLAB	0.06	0.045	16 - 44
RC T-BEAM	0.07	0.065	40 - 60
RC BOX	0.06	0.055	50 - 120
CIP/PS SLAB	0.03	0.03	40 - 65
CIP/PS BOX	0.045	0.04	100 - 250
PC/PS SLAB	0.03 (+3" AC)	0.03 (+3" AC)	20 - 50
PC/PS	0.06 (+3" AC)	0.055 (+3" AC)	30 - 120
BULB T GIRDER	0.05	0.045	90 - 145
PC/PS I	0.055	0.05	50 - 120
PC/PS BOX	0.06	0.045	120 - 200
STRUCT STEEL I GIRDER	0.045	0.04	60 - 300

EXHIBIT 13-B

Analysis of Ordinary Bridges that Cross Faults

EXHIBIT 13-B

ANALYSIS OF ORDINARY BRIDGES THAT CROSS FAULTS

Introduction

A bridge that crosses an active fault is subject to a severe combination of seismic hazards. The ground shaking component can cause a large dynamic deformation demand due to near fault effects such as directivity and the velocity pulse. The surface rupture component can cause an additional large quasi-static deformation demand due to the fault offset and angle of rupture relative to the bridge. While a nonlinear time history analysis (NLTH) using multiple time history records may be used to estimate the seismic demands for bridges crossing faults, more simplified methods may be appropriate for ordinary bridges. That being the case, an alternative method is presented here with simplified procedures appropriate for bridge designers addressing typical strike-slip fault crossings, the most common faulting situation in California. The analysis presented in this document combines these seismic hazards in a simplified approach. This simplified procedure may be used for ordinary bridge fault crossing projects in lieu of a nonlinear time history analysis.

Many faults have small offsets and the resulting deformation can be addressed using ductile columns with adequate displacement capacity and supports with adequate seat length. For larger fault offsets, hinges and isolation bearings can be designed to handle the resulting displacements. For very large offsets other strategies, such as designing the bridge with wide bents that can slide under the superstructure while continuing to support it, may be needed. Addressing fault offsets is more complex for existing bridges.

General Purpose and Problem Statement

Although a few exceptions exist, fault rupture hazard is addressed only for Holocene (< 10,000 year old) faults identified by the California Geological Survey in Alquist-Priolo Earthquake Fault Zone maps. According to Petersen et al (2011), "…fault rupture hazard analysis should be an important consideration in the design of structures or lifelines that are located near the principal fault, within about 100 m [330 ft] of well-mapped active faults with a simple trace and within 300 m [1,000 ft] of faults with poorly defined or complex traces." When a bridge crosses such a fault, it must be designed for the displacement demand resulting from a static fault offset, the dynamic response**,** and any other fault-induced hazard (e.g., creep) that may occur at the site. The larger of the average deterministically-derived and the probabilistically-derived (with 5% in 50 years probability of exceedance) predicted fault offset, or a site-specific predicted offset obtained from a field investigation should be used. All recommendations should include an evaluation of the probability of rupture occurring off mapped fault traces and incorporate any available site-specific data (see Petersen et al, 2011). When the deterministically derived predicted fault offset is much larger than the probabilistically derived predicted fault offset, a risk assessment study is recommended to justify the potentially large cost. In such cases the engineer can ask the Office

of Earthquake Engineering (OEE) or the Structures Design Oversight Representative (SDOR) for a reassessment of the predicted offset as described in MTD20-11.

Surface faults can vary from a well-defined single trace to a poorly-defined zone of disruption and from a horizontal to a nearly vertical ground displacement (see Figure 13-1). The location of the fault (or fault zone) with respect to the structure and a determination of the design fault offset shall be included in the Seismic Recommendations of the project's Foundation Report. The bridge engineer uses this information to meet the performance requirements in Caltrans' Seismic Design Criteria (SDC) **[1].**

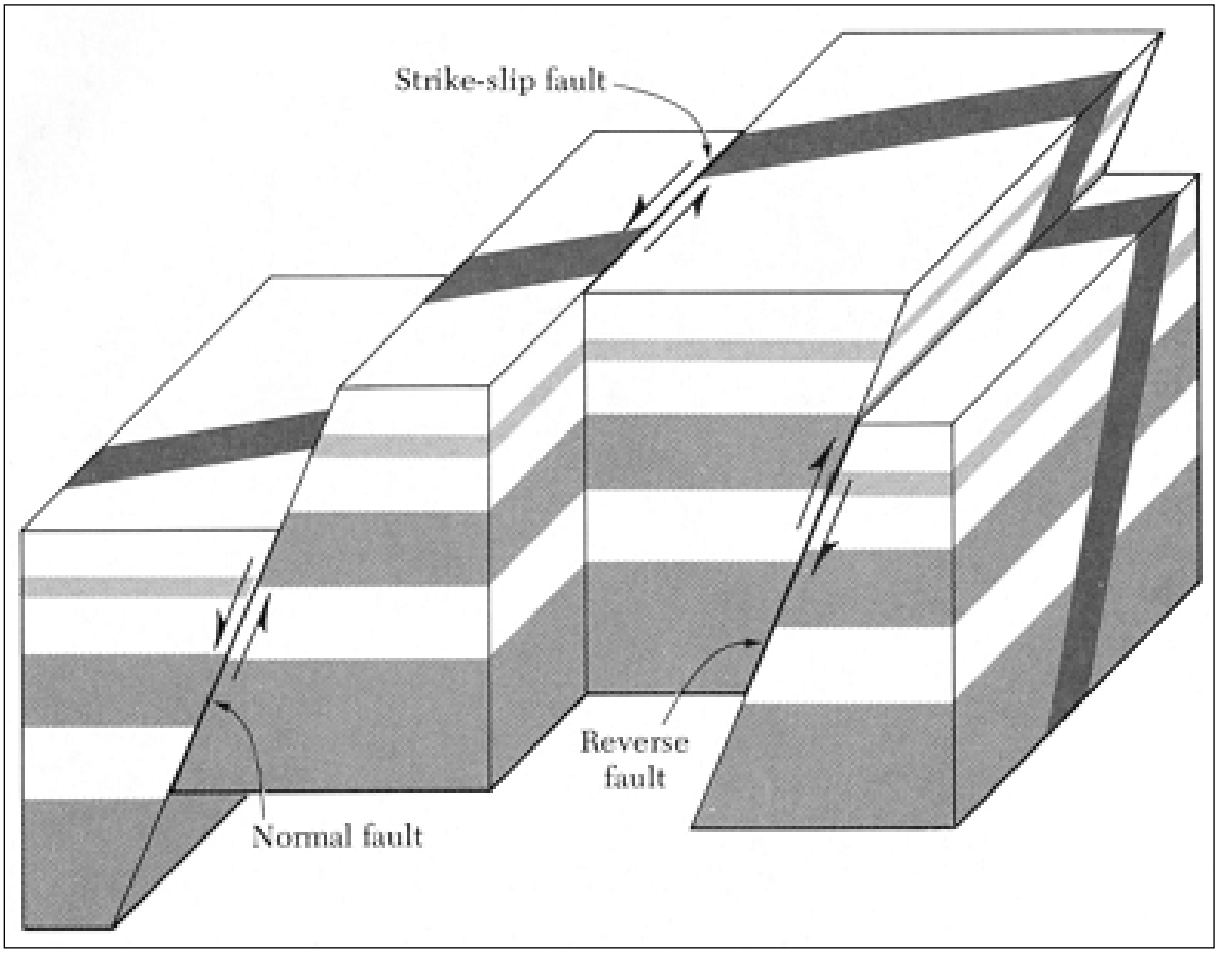


Figure 13-1. Schematic of main types of faults.

Procedure

A simplified method is provided for designing Ordinary Standard and Ordinary Non-Standard bridges that cross faults, based on research conducted by Professor Anil K. Chopra at the University of California at Berkeley **[2]**.

The abutment and bridge foundations on one side of a strike–slip fault are offset an equal and opposite distance from the bridge foundations on the other side of the fault (see Figure 13-2). In addition, the bridge is subjected to ground shaking. The resulting static and dynamic

displacements are combined to obtain the seismic demands. The response of interest is the relative displacement between the top and bottom of the columns and between the superstructure and the abutment seats. Other responses, such as shear and flexural demands, will be based on plastic hinging of the columns.

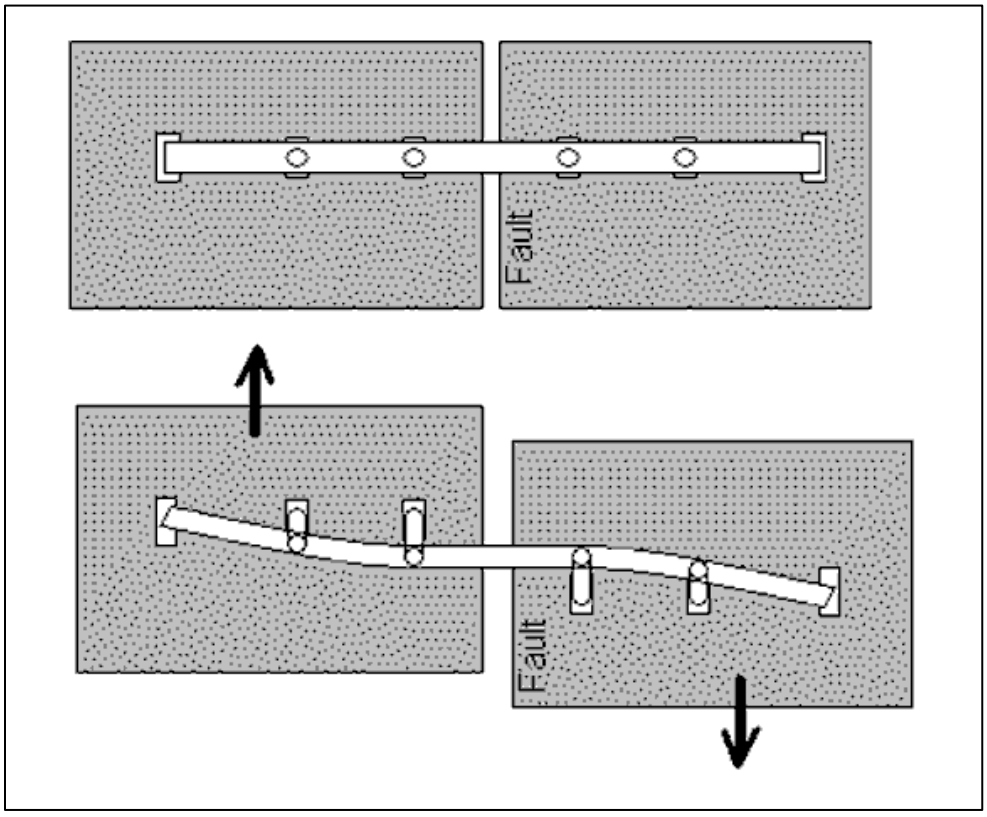


Figure 13-2. *Drawing of a bridge crossing a right-lateral strike-slip fault that is perpendicular to the bridge. Note that in this example the abutment shear keys did not break and that the bents closest to the fault have the most relative column displacement.*

Strike-slip fault crossings should be analyzed and designed for one of the following situations.

When the fault is within 30 degrees of being normal to the bridge, analyze and design the bridge for the vector component of the fault offset normal to the bridge and for ground shaking using the Linear Dynamic Method (see next section).

When the fault is at other angles to the bridge, analyze and design the bridge for the fault offset and for ground shaking using the Linear Elastic Method (see next section).

When a bridge crosses several fault traces, crosses a dipping fault or a fault characterized primarily by dip-slip movement, or is subject to other fault impacts such as creep, the engineer should consult with OEE or with the SDOR for guidance.

Steps of Procedure

1: Obtain the Design Fault Offset and Design Spectrum for the Bridge Site

The predicted location, amount, and direction of displacement at the structure due to the fault offset is provided by Geotechnical Services (GS) or by a geotechnical consultant with GS approval. The displacement of the longitudinal and/or the transverse vector component of the predicted fault offset (called the **Design Fault Offset**) is based on the larger of the probabilistic or deterministic offset or a site-specific offset as described on page 1. The Design Spectrum should be calculated as described in Caltrans SDC Appendix B **[1]** (unless the LSA Method is used).

2: Obtain the Quasi-Static Response of the Structure due to the Design Fault Offset

A model of the bridge, including column plastic hinges (and possibly nonlinear springs for the shear keys and soil at the abutments based on the parameters provided in the SDC) is required to capture the behavior of the bridge for the **Design Fault Offset**. Gravity loads are applied to the bridge model followed by foundation offsets due to the fault movement. The relative displacement between the top and bottom of the columns (and between the superstructure and abutment seats) are recorded as the fault offset displacements.

3: Obtain the Dynamic Response of the Structure

The UC Berkeley Fault Rupture Study proposed three alternate procedures for computing the dynamic part of the response; (1) Modal Pushover Analysis (MPA), (2) Linear Dynamic Analysis (LDA), and (3) Linear Static Analysis (LSA). MPA is the most complicated procedure and requires special purpose software to make it convenient for use in design. LDA is less difficult and the results can be conveniently obtained using SAP2000 software. LSA is the easiest to use but it may be too conservative since it excites the structure with 2.5 times the peak ground acceleration (see below). Therefore, LDA should be used whenever possible. It is not recommended that MPA be used at this time due to a lack of adequate software.

A. Linear Static Analysis (LSA)

The dynamic response of the nonlinear bridge can be estimated with a linear analysis. Furthermore, the elastic response of the bridge can be conservatively estimated by a static analysis of the structure due to the lateral forces $= m \cdot i_{eff} A_{\max}$, where,

m = Structural mass matrix (mass of superstructure at the bents and abutments)

i_{eff} = Fault rupture influence vector (normalized displacements due to unit offset)

$A_{\max}$ = Peak response spectrum acceleration.

Because $A_{\max} \approx 2.5 \cdot PGA$, the lateral force (F) at the top of the substructure is computed as:

$$F = 2.5 \cdot mass \cdot PGA \cdot i_{eff}$$

B. Linear Dynamic Analysis (LDA)[1]

LDA is usually carried-out using a single-mode analysis of the most dominant mode of the bridge for fault rupture. Note that the most dominant mode for fault rupture may be different from the most dominant mode in a non-fault rupture situation.

The peak dynamic response is computed as follows:

1. Compute the vibration periods (T_n) and mode shapes (ϕ_n) of the bridge.

2. Compute the effective influence vector (i_{eff}).

3. Identify the most dominant mode by static analysis of the bridge using the following procedure[2]:

   a. Compute the displacement r^{st} by static analysis of the bridge due to forces equal to ($m \cdot i_{eff}$) applied at the structural DOFs.

   b. Compute the modal static response, r_n^{st}, by static analysis of the bridge due to forces ($\Gamma_n m\phi_n$) applied at the structure DOF, where $\Gamma_n = \phi_n^T m i_{eff} \big/ \phi_n^T m \phi_n$

   c. Compute the modal contribution factor for the nth mode, $\overline{r_n} = r_n^{st} \big/ r^{st}$

   d. The most dominant mode is the mode with the largest modal contribution factors.

4. Compute the displacement r_0 by **linear analysis** of the bridge due to equivalent static forces, $s_n = \Gamma_n m \phi_n A_n$, where s_n corresponds to the most dominant mode and A_n is the spectral acceleration corresponding to T_n, the period of the most dominant mode.

4: Combine the Static and Dynamic Response to Obtain the Seismic Demand

The peak values of seismic demands are obtained by superposition of the peak values of the static and dynamic parts of the response to provide a generally conservative estimate of deck displacement and column drifts, when compared to the results of the "Exact" analysis.

[1] The LDA procedure assumes that only a single mode dominates the response. In some cases, it may be necessary to consider several modes. Always check the first ten or so modes to ensure only a single mode has the same shape as the offset structure and most of the participating mass.

[2] Step 3B provides a way of identifying the most dominant mode for a given structure. For simple structures, the most dominant mode is easily identifiable by an inspection of the various mode shapes. For instance, when the bridge is normal to the fault, the deformed shape under fault rupture displacement involves movement of the supports on one side of the fault in the opposite direction of the supports on the other side of the fault. These deformations cause the superstructure deck to rotate in plane around a point on the fault line. The most dominant mode for fault rupture has to be a mode that involves a similar deformed shape.

5: Perform a Pushover Analysis at Each Bent to Obtain the Seismic Capacity

A pushover analysis at each bent is performed to ensure that the displacement capacity is greater than the displacement demand obtained in **Step 4**. The displacement capacity is reached when degradation threatens the stability of the structure or there's a 20% drop in the load-carrying capacity of the bent (see SDC Section 4). An example of a pushover analysis is presented in the fault crossing design example in Bridge Design Aids Section 14-6 **[3]**. The bent should be pushed in the same direction (either longitudinally or transversely) as the **Design Fault Offset.**

Conclusion

A method for obtaining the displacements at columns and abutments at fault crossings has been presented. All the requirements in the SDC must also be followed. Adequate bearing seats must be provided so the superstructure can slide at the abutment, bent, or hinge seats without falling. Abutment shear keys are ignored since they are designed to fail during a large earthquake. If the shear keys don't break they will need to be addressed as they can cause large column displacements by restraining the ends of the superstructure. When the end of the superstructure cannot move freely it should be modeled as fixed or with springs.

REFERENCES

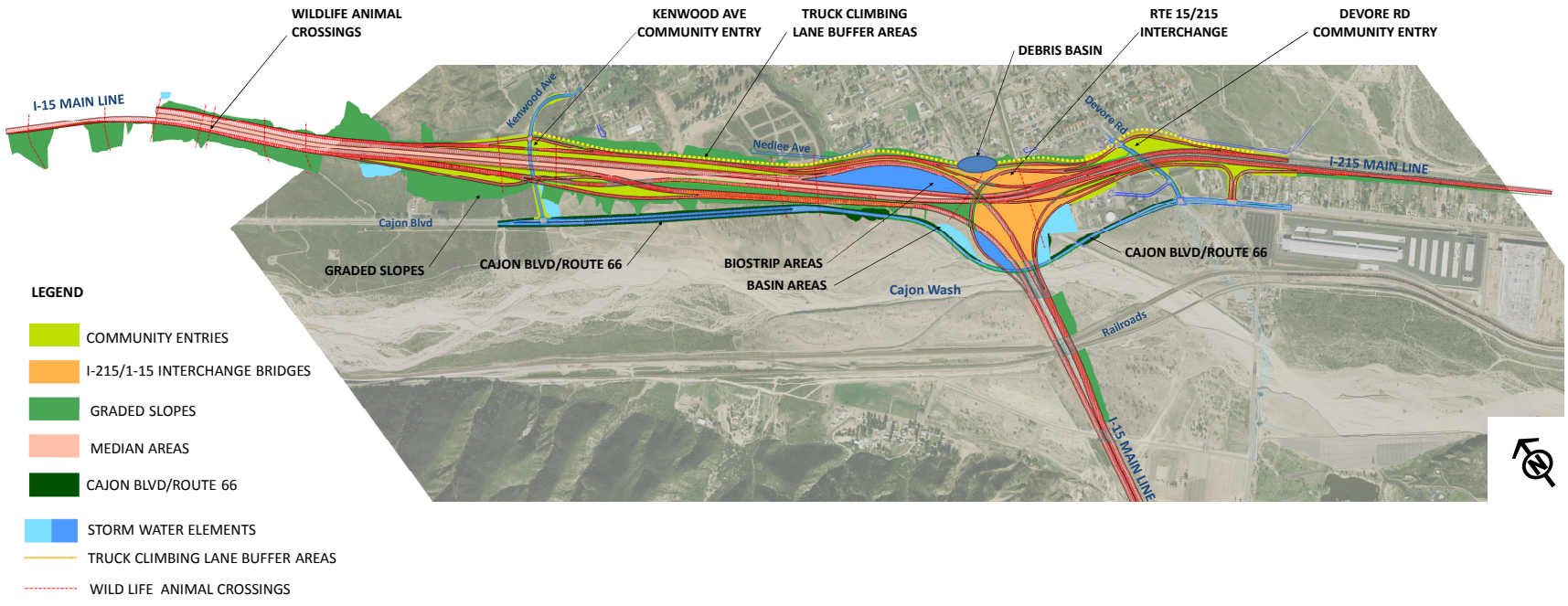
1. Caltrans, "Seismic Design Criteria"
2. Chopra Anil K., and Rakesh K. Goel "Analysis of Ordinary Bridges Crossing Fault Rupture 'Zones," Research Conducted for the California Department of Transportation Contract No. 59A0435 Earthquake Engineering Research Center University of California at Berkeley February 2008 Report No. UCB/EERC-2008/01. (http://www.dot.ca.gov/hq/esc/earthquake_engineering/stap/).
3. Caltrans "Bridge Design Aids" *Section 14 Seismic*.
4. Petersen, M., and others, 2011, Fault displacement hazard for strike-slip faults: Bull. Seism. Soc. Amer., 101, pp.805-825.

EXHIBIT 14-A

Revegetation Treatment and Location Concept Plan

Exhibit 14-A: Revegetation Treatment and Location Concept Plan

EXHIBIT A
REVEGETATION TREATMENT AND LOCATION CONCEPT PLANS



1

REVEGETATION REQUIREMENTS

COMMUNITY ENTRIES

Both Devore Road and Kenwood Avenue shall have a common element identifying them as community entries. Trees placed in this area shall be no larger then 1 gallon in size.

Chapter 6.0 Avoidance, Minimization, and Mitigation Measures shall be implemented as described in V3 Highway Planting, page 6-2 of the VISUAL IMPACT ASSESSMENT

GRADED SLOPES

Areas identified with contour grading, landform grading, and slope rounding shall be revegetated with the native plant communities.

Chapter 6.0 Avoidance, Minimization, and Mitigation Measures shall be implemented as described in V3 Highway Planting page 6-2, V7 page 6-3, and V-8 page 6-3 of the VISUAL IMPACT ASSESSMENT

All graded slopes will be revegetated so that mature (non-pioneer) species cover is established. Planting will be site-specific and vary according to slope aspect and elevation. Irrigation as necessary to establish planting is considered part of this revegetation planting. Revegetation will be required for all disturbed ground as well as graded slopes.

STORM WATER ELEMENTS

The proposed areas shall be re-vegetated with 70 percent cover of plant species that will be supported only by ephemeral waters. The identified locations for bioswales, biostrips, basins and storm drains shall consist of plant species that are existent within the specified areas.

Chapter 6.0 Avoidance, Minimization, and Mitigation Measures, V3 Highway Planting, page 6-2 shall be implemented as described in the VISUAL IMPACT ASSESSMENT

Rip-rap and other constructed elements will be colored to match native soil to minimize visual intrusion.

I-15/215 INTERCHANGE BRIDGES

Areas adjacent to bridge and wall elements will be planted to minimize/mitigate the increased scale of built elements. Native plant massing, appropriate to each specific location, will be provided to minimize local visual impacts.

Chapter 6.0 Avoidance, Minimization, and Mitigation Measures shall be implemented as described in V3 Highway Planting, page 6-2 of the VISUAL IMPACT ASSESSMENT

CAJON BLVD/ ROUTE 66

Note: Street trees per Glen Helen Specific Plan will not be included.

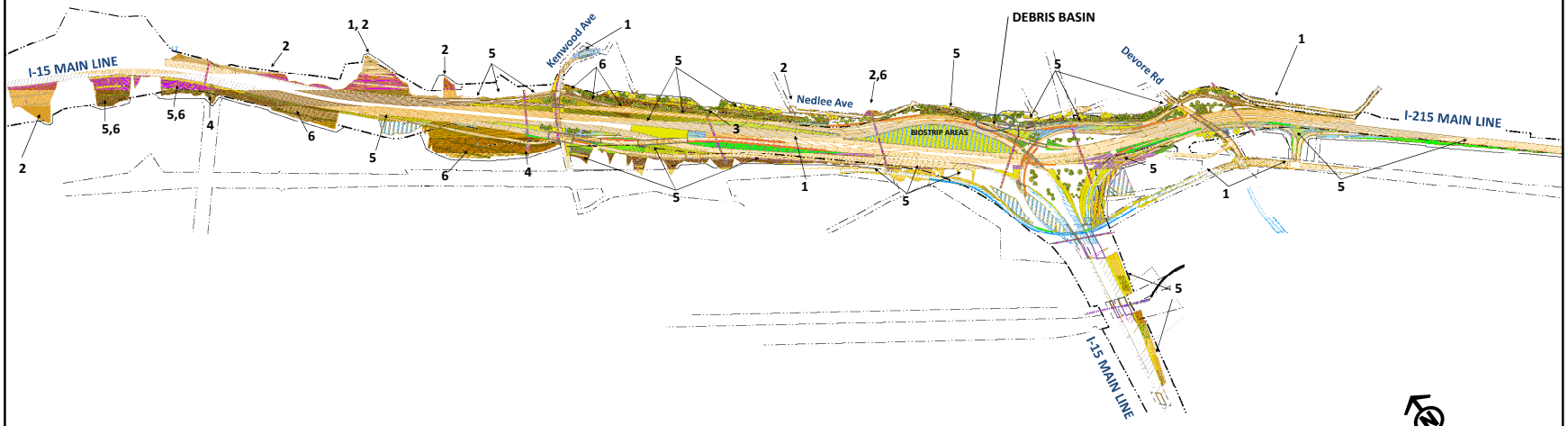
Chapter 6.0 Avoidance, Minimization, and Mitigation Measures shall be implemented as described in V3 Highway Planting page 6-2, V7 page 6-3, and V-8 page 6-3 of the VISUAL IMPACT ASSESSMENT

TRUCK CLIMBING LANE BUFFER AREAS

The Truck Climbing Lane planting area will be comprised of 1 gallon size trees that, when grown, shall act as a visual buffer. Both northerly and southerly ends of this planted area shall blend into the respective plant communities. There shall be no abrupt or defined edge for these planting areas.

Chapter 6.0 Avoidance, Minimization, and Mitigation Measures, V3 Highway Planting, page 6-2 shall be implemented as described in the VISUAL IMPACT ASSESSMENT

REVEGETATION COMMUNITIES PLAN



Legend

- New Structures
- Existing Structures
- Existing Wild Life Crossings
- Retaining Wall facing Highway
- Retaining Wall facing Cajon Road
- Retaining Wall facing Cajon Wash
- Existing Right of Way Line
- Proposed Right of Way Line
- Grading Contours

Revegetation Type Plant Comunities Legend

- 1 California Buckwheat Scrub
- 2 Chaparral
- 3 Sycamore Alluvial Woodland
- 4 Pioneer Riversidean Alluvial Fan Sage Scrub
- 5 Intermediate Riversidean Alluvial Fan Sage Scrub
- 6 Mature Riversidean Alluvial Fan Sage Scrub
- Storm Water Elements (to include Willow Gooding's Willow and Mule Fat)
- California Black Walnut
- Western Sycamore
- Hollyleaf Cherry
- Coast Live Oak

0 2,050 4,100 8,200 Feet

3

REVEGATION PLAN COMMUNITIES LIST

CALIFORNIA BUCKWHEAT SCRUB

Botanical Name	Common Name	Growing Habit
Eriogonum fasciculatum	California buckwheat	1-3ft shrub
Eriogonum fasciculatum var. pc	California buckwheat	
var. polifolium		

CHAPARRAL

Botanical Name	Common Name	Growing Habit
Adenostoma fasciculatum	Chamise	shrub 13ft
Cercocarpus betuloides		tree/shrub 9-15ft
var. betuloides	Birchleaf mountain mahogany	
Ceanothus leucodermis	Chapparal whitethorn	shrub 13ft
Ceanothus cuneatus	Buckbrush	shrub 10ft+
Ceanothus crassifolius	Hoary-leaf ceanothus	shrub 10ft+
Quercus berberidifolia	Scrub oak	shrub 6-7 ft
Prunus ilicifolia	Hollyleaf cherry	Tree 14 ft

SYCAMORE ALLUVIAL WOODLAND

Botanical Name	Common Name	Growing Habit
Platanus racemosa	Western sycamore	tree 75 ft
**scattered RAFSS species*		

RIVERSIDEAN ALLUVIAL FAN SAGE SCRUB

Pioneer RAFSS 10% Coverage

Botanical Name	Common Name	Growing Habit
Lepidospartum squamatum	Scalebroom	shrub 3-5ft
Eriodictyon crassifolium	Yerba santa	shrub 10ft
Eriogonum fasciculatum	California buckwheat	shrub 7ft
Eriogonum fasciculatum var. ¡	California buckwheat	shrub 7ft
var. polifolium		
Lotus scoparius	Deerweed	1-3ft
Croton californicus	California croton	3ft
Yucca whipplei	Chaparral yucca	10ft
Opuntia littoralis	Coastal prickly pear	

MULE FAT SCRUB

Botanical Name	Common Name	Growing Habit
Baccharis salicifolia	Mule Fat	flowering shrub 5ft+

WILLOW WOODLAND

Botanical Name	Common Name	Growing Habit
Salix gooddingii	Gooding's willow	tree 75-100ft

RIVERSIDEAN ALLUVIAL FAN SAGE SCRUB

Intermediate RAFSS 50% Coverage

Botanical Name	Common Name	Growing Habit
Juglans californica		15-25ft tree
var. californica	Southern california black walnut	
Platanus racemosa	Western sycamore	75ft
Lepidospartum squamatum	Scalebroom	shrub 3-5ft
Eriodictyon crassifolium	Yerba santa	shrub 10ft
Eriogonum fasciculatum	California buckwheat	shrub 7ft
Eriogonum fasciculatum var. polifolium	California buckwheat	shrub 7ft
Croton californicus	California croton	shrub 3ft
Yucca whipplei	Chapparral yucca	shrub 10ft
Opuntia littoralis	Coastal prickly pear	
Artemisia californica	California sage	shrub 8ft
Artemisia dracunculus	Tarragon	shrub 5ft
Salvia apiana	White sage	shrub 5ft

RIVERSIDEAN ALLUVIAL FAN SAGE SCRUB

Mature RAFSS

Botanical Name	Common Name	Growing Habit
Eriodictyon crassifolium	Yerba santa	shrub 10ft
Juglans californica var. californica	Southern california black walnut	15-25ft tree
Adenostoma fasciculatum	Chamise	shrub 13ft
Cercocarpus betuloides var. betuloides	Birchleaf mountain mahogany	tree/shrub 9-15ft
Ceanothus cuneatus	Buckbrush	shrub 10ft+
Ceanothus crassifolius	Hoary-leaf ceanothus	shrub 10ft+
Prunus ilicifolia	Hollyleaf cherry	tree 14ft+
Artemisia californica	California sage	shrub 8ft
Rhamnus crocea	Redberry buckthorn	shrub 7ft
Salvia apiana	White sage	shrub 5ft
Platanus racemosa	Western sycamore	tree 75ft

COAST LIVE OAK (Large Indiviuals)

Botanical Name	Common Name	Growing Habit
Quercus agrifolia	Coast Live Oak	30-75ft tree

4

NATIVE GRASS HYDROSEED MIX

The mix of native grasses/native revegetation as provided below shall be hydroseeded in a 30 foot wide mowable strip along the periphery of all roadway edges, including ramps. They shall be hydroseeded within the revegation plant community areas. Hydroseeded areas in those plant communities shall be reduced by a 30 foot width accordingly.

Native Grass and Intermediate RAFSS

SEED CALCS:

Botanical Name	Common Name	% OF MIX
Eriogonum fasciculatum	California Buckwheat	5.00%
Eriogonum fasciculatum var polyfolium	California Buckwheat	5.00%
Lotus scoparius	Deerweed	6.00%
Yucca whipplei	Our Lord's Candle	6.00%
Artemisia californica	California Sagebrush	6.00%
Artemisia dracunculus	Tarragon Sagebrush	6.00%
Salvia apiana	White Sage	6.00%
Aristida purpurea	Purple three-awn	20.00%
Melica imperfect	Smallflowered melic	20.00%
Vulpia microstachys	Desert fescue	20.00%
		100.0%

Native Grass and Pioneer RAFSS

SEED CALCS:

Botanical Name	Common Name	% OF MIX
Eriogonum fasciculatum	California Buckwheat	7.0%
Eriogonum fasciculatum var polyfolium	California Buckwheat	7.0%
Lotus scoparius	Deerweed	13.0%
Aristida purpurea	Purple three-awn	20.0%
Melica imperfect	Smallflowered melic	20.00%
Vulpia microstachys	Desert fescue	20.0%
Yucca whipplei	Our Lord's Candle	13.0%
		100.0%

Native grass and Mature RAFSS

SEED CALCS:

Botanical Name	Common Name	% OF MIX
Artemisia californica	California Sagebrush	5.00%
Salvia apiana	White Sage	5.00%
Aristida purpurea	Purple three-awn	30.00%
Melica imperfect	Smallflowered melic	30.00%
Vulpia microstachys	Desert fescue	30.00%
		100.00%

Native Grass,Sycamore Alluvial Woodland w/ scattered RAFSS

SEED CALCS:

Botanical Name	Common Name	% OF MIX
Eriogonum fasciculatum	California Buckwheat	2.5%
Eriogonum fasciculatum var polyfolium	California Buckwheat	2.5%
Lotus scoparius	Deerweed	4.0%
Yucca whipplei	Our Lord's Candle	4.0%
Artemisia californica	California Sagebrush	4.0%
Salvia apiana	White Sage	4.0%
Artemisia dracunculus	Tarragon Sagebrush	4.0%
Aristida purpurea	Purple three-awn	25.0%
Melica imperfect	Smallflowered melic	25.0%
Vulpia microstachys	Desert fescue	25.0%
		100.0%

Native Grass and Mule Fat Scrub

SEED CALCS:

Botanical Name	Common Name	% OF MIX
Baccharis salicifolia	Mule Fat	10.0%
Aristida purpurea	Purple three-awn	30.0%
Melica imperfect	Smallflowered melic	30.0%
Vulpia microstachys	Desert fescue	30.0%
		100.0%

Native Grass and Chaparral

SEED CALCS:

Botanical Name	Common Name	% OF MIX
Aristida purpurea	Purple three-awn	33.0%
Melica imperfect	Smallflowered melic	33.0%
Vulpia microstachys	Desert fescue	33.0%
		99.0%

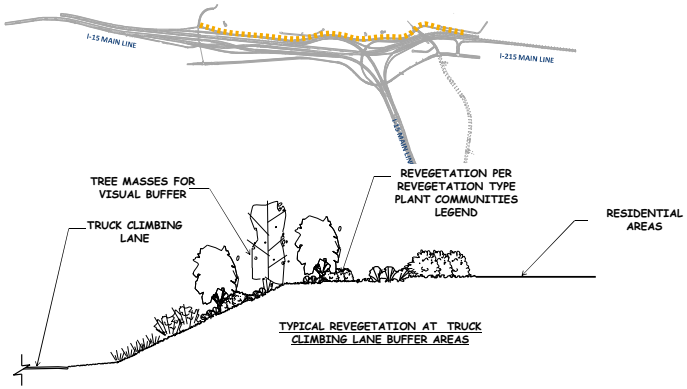
Native Grass and California Buckwheat Scrub

SEED CALCS:

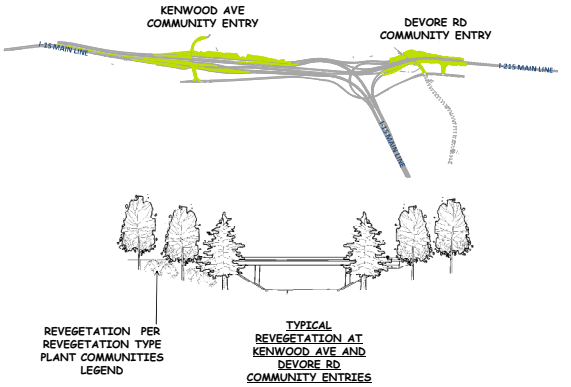
Botanical Name	Common Name	% OF MIX
Eriogonum fasciculatum	California Buckwheat	5.0%
Eriogonum fasciculatum var polyfolium	California Buckwheat	5.0%
Aristida purpurea	Purple three-awn	30.0%
Melica imperfect	Smallflowered melic	30.0%
Vulpia microstachys	Desert fescue	30.0%
		100.0%

REVEGATION DETAIL CONCEPTS

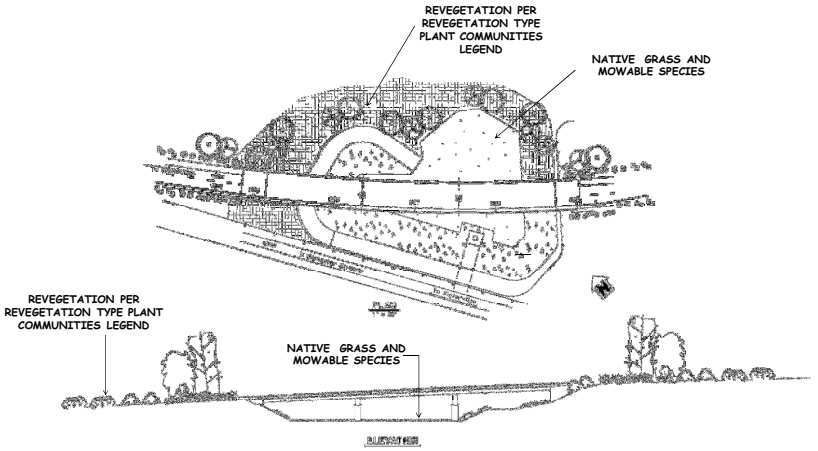
TRUCK CLIMBING LANE BUFFER AREAS



KENWOOD AVE AND DEVORE RD COMMUNITY ENTRIES



STORM WATER ELEMENTS



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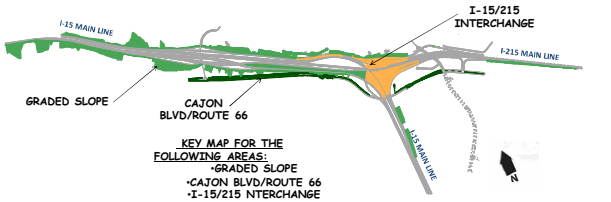
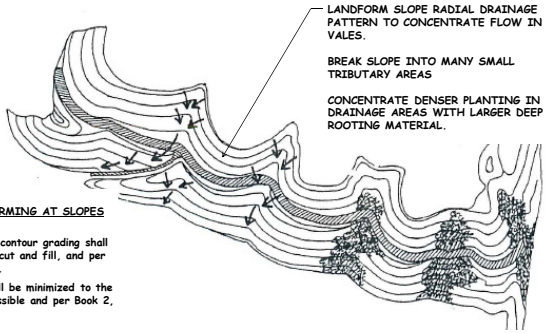
REVEGATION DETAIL CONCEPTS



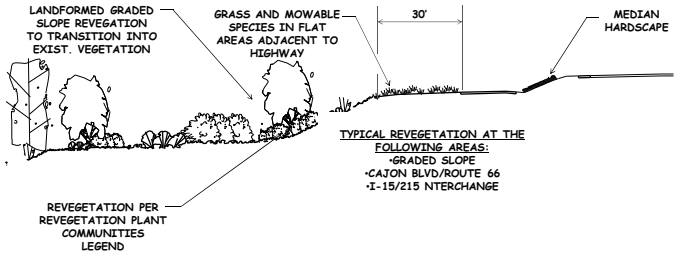
KEY MAP FOR THE FOLLOWING AREAS:
- GRADED SLOPE
- CAJON BLVD/ROUTE 66
- I-15/215 NTERCHANGE



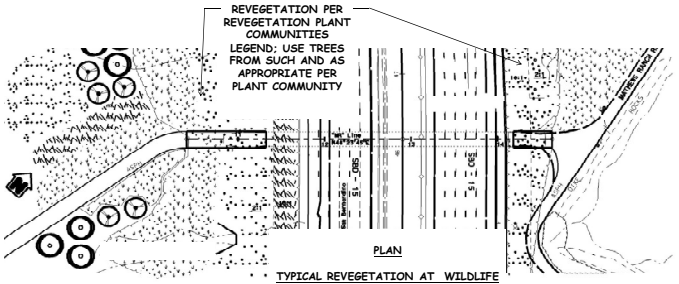
TYPICAL LANDFORMING AT SLOPES

Slope rounding and contour grading shall be used on all new cut and fill, and per Book 2, Section 15.

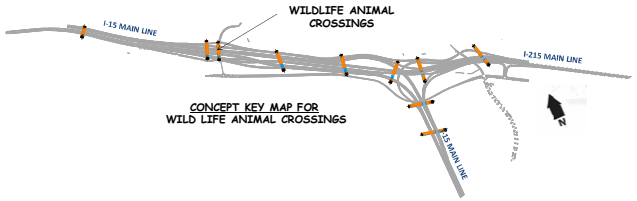
Slope-benching shall be minimized to the greatest extent possible and per Book 2, Section 15.



TYPICAL REVEGETATION AT THE FOLLOWING AREAS:
- GRADED SLOPE
- CAJON BLVD/ROUTE 66
- I-15/215 NTERCHANGE



TYPICAL REVEGETATION AT WILDLIFE ANIMAL CROSSINGS



CONCEPT KEY MAP FOR WILD LIFE ANIMAL CROSSINGS

TYPICAL REVEGETATION AT WILDLIFE ANIMAL CROSSINGS

EXHIBIT 14-B

Pesticides

EXHIBIT 14 - B: PESTICIDES

Pesticides used to control weeds shall conform to the provisions in Section 20-4.026, "Pesticides," of the Standard Specifications. Except as otherwise provided in these special provisions, pesticide use shall be limited to the following materials:

Cacodylic Acid
Diquat
Fluazifop-butyl
Glyphosate
Isoxaben (Preemergent)
Sethoxydim
Oxadiazon - 50 percent WP (Preemergent)
Oryzalin (Preemergent)
Pendimethalin (Preemergent)
Prodiamine (Preemergent)
Trifluralin (Preemergent)
Ammonium Sulfate
Magnesium Chloride
Melfluidide (Growth regulator)
Napropamide (Preemergent)

Granular preemergents may be used when applied to areas that will be covered with mulch, excluding plant basins. Granular preemergents shall be limited to the following materials:

Dichlobenil (Preemergent)
Oxadiazon (Preemergent)

Granular preemergents shall be applied prior to the application of mulch. Mulch applications shall be completed in these areas on the same working day. Photosensitive dye will not be required.

Glyphosate shall be used to kill stolon type weeds.

Oxadiazon shall be of the emulsifiable concentration or wettable powder type, except when Oxadiazon is used under mulch in conformance with these special provisions.

Prior to the application of preemergents, ground cover plants shall have been planted a minimum of 3 days and shall have been thoroughly watered.

A minimum of 100 days shall elapse between applications of preemergents.

Except for ground cover plants, preemergents shall not be applied within 18 inches of plants or within seeding areas.

Growth regulators shall not be applied within 6 feet of trees, shrubs or vines.

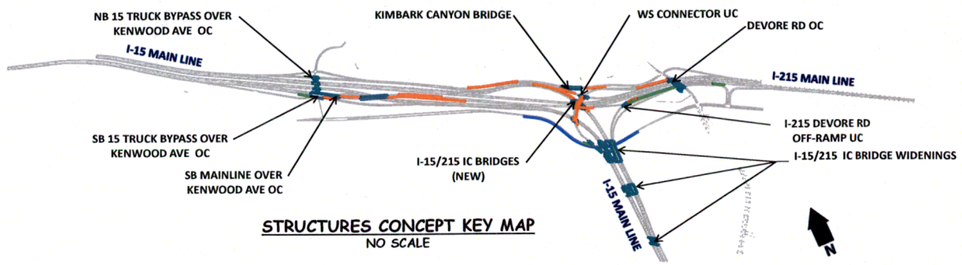
Ammonium sulfate and magnesium chloride shall be used only in areas planted to Carpobrotus or Delosperma. Ammonium sulfate and magnesium chloride shall not be applied in a manner that allows the pesticides to come in contact with trees or shrubs.

If the Contractor elects to request the use of other pesticides on this project, the request shall be submitted, in writing, to the Engineer not less than 15 days prior to the intended use of the other pesticides. Except for the pesticides listed in these special provisions, no pesticides shall be used or applied without prior written approval of the Engineer.

Pesticides shall not be applied within the limits of the plant basins. Pesticides shall not be applied in a manner that allows the pesticides to come in contact with the foliage and woody parts of the plants.

EXHIBIT 15-A

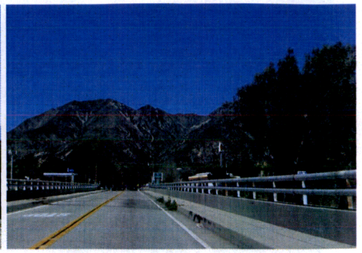
Structures Aesthetics Concept Plan



STRUCTURES CONCEPT KEY MAP
NO SCALE

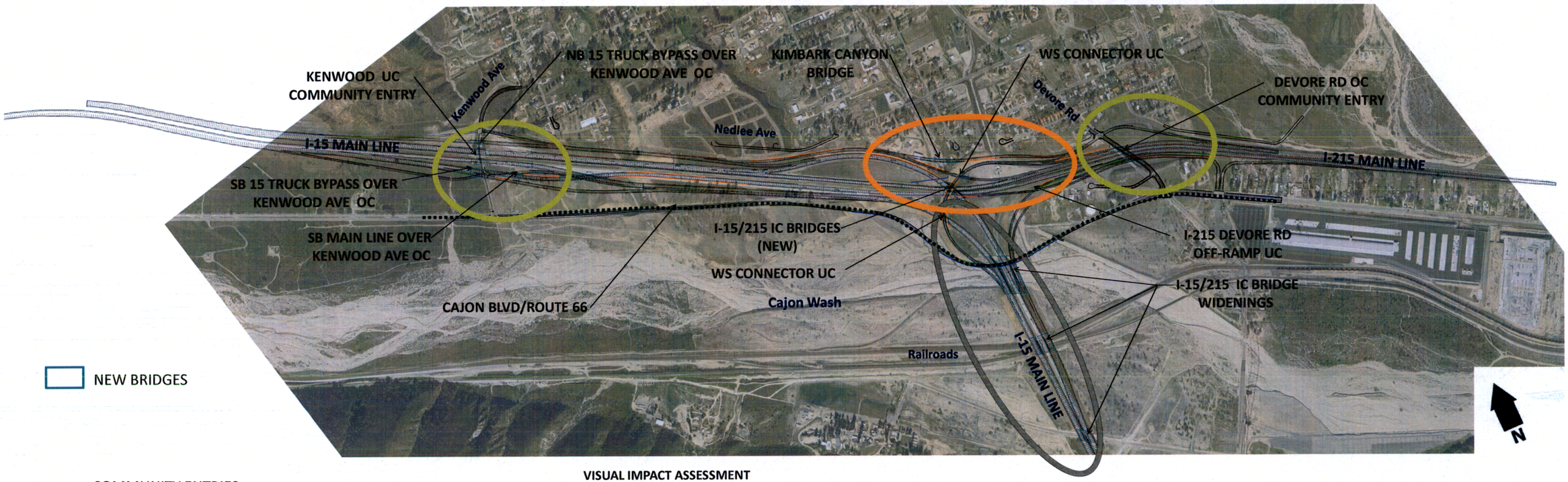
KENWOOD AVENUE OC (W VIEW)

DEVORE RD OFF RAMP (S VIEW)



DEVORE RD OC (E VIEW)

STRUCTURES AESTHETIC CONCEPT



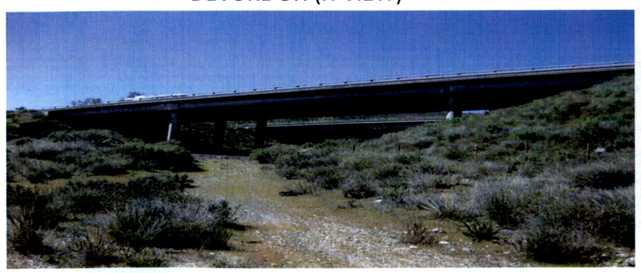
NEW BRIDGES

COMMUNITY ENTRIES
CAJON BLVD/ROUTE 66
I-15/215 INTERCHANGE BRIDGES
EXISTING/TO BE WIDENED

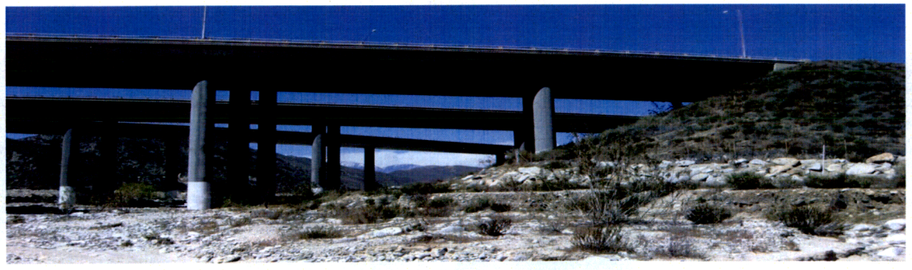
VISUAL IMPACT ASSESSMENT
January 2011,
Chapter 6.0 Avoidance, Minimization, and Mitigation Measures,
V6 Structures, page 6-3

"...Architectural/aesthetic treatment of bridges will address the interchange as a unique and vivid visual asset. Structures will include shape and textural elements as appropriate to link them to adjacent Hardsurface Plan elements. Girders and barriers will incorporate similar unifying treatments. Support for lighting and signage will incorporate linking elements of the base or the pole itself to the overall structure. These minimization/mitigation measures will address the visual impacts of the proposed structures by integrating its elements into a visually unified structure linked into surrounding ground treatment...."

DEVORE OH (N VIEW)



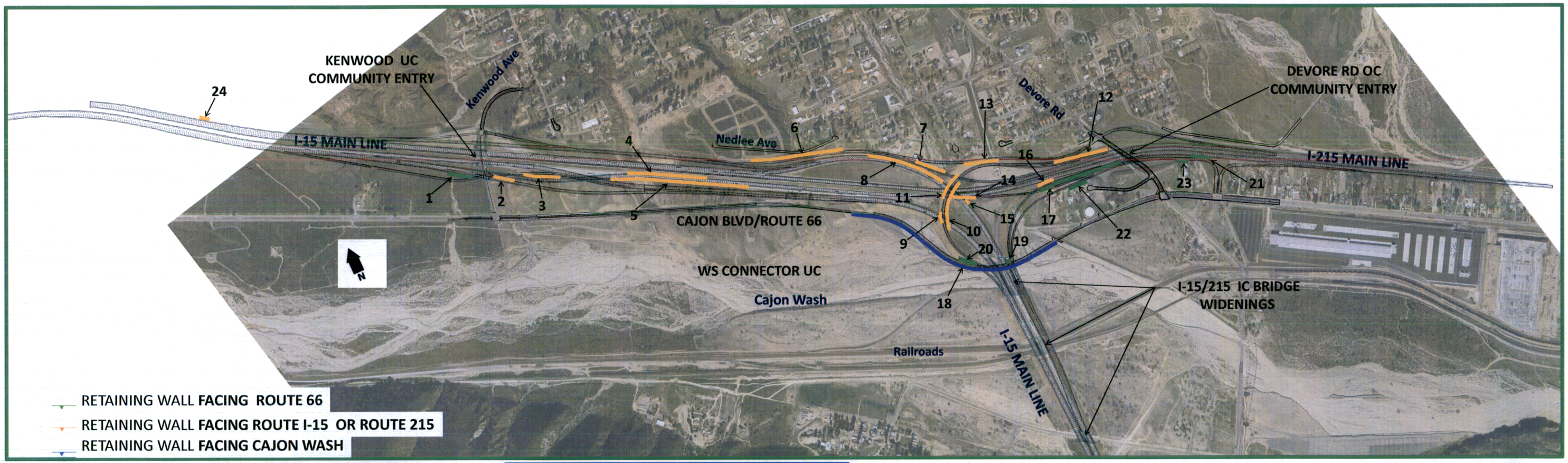
CAJON CREEK BRIDGE (N VIEW)

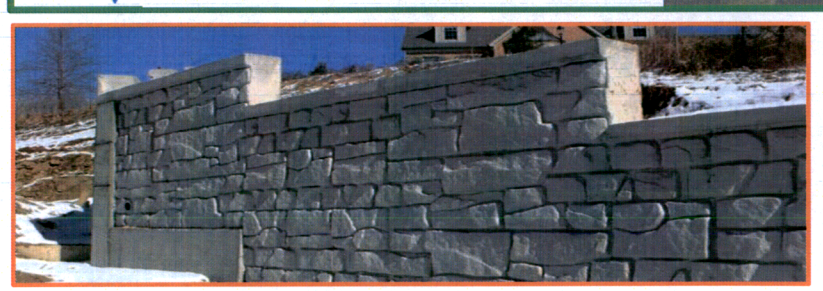


RTE 15/215 SEPARATION (W VIEW)

RTE 15/215 SEPARATION (N VIEW)

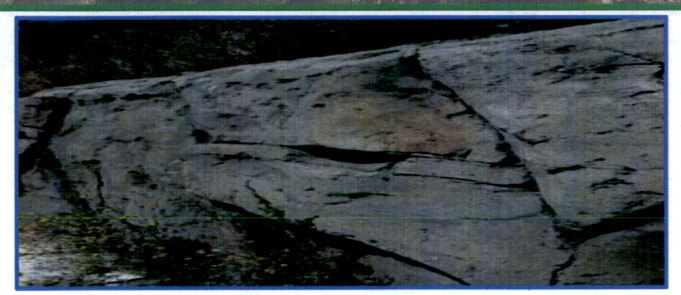
RETAINING WALLS
TO HAVE AESTHETIC TREATMENT





DRY STACKED ARCHITECTURAL SURFACE
(TEXTURED CONCRETE -SEE DETAIL "C")
RETAING WALLS **FACING ROUTES, AND FOR ABUTMENT WALLS, WING WALLS AND ANY WALL CONNECTING TO ABUTMENT WALLS.**
TEXTURE SHALL MATCH THE TEXTURE, COLOR, AND PATTERN OF THE REFEREE SAMPLE LOCATED AT DISTRICT 8 CALTRANS LANDSCAPE ARCITECTURE DEPARTMENT.

A TEST PANEL OF AT LEAST 8'X8' SHALL BE COMPLETED AT A DEPARTMENT APPROVED LOCATION AND ACCEPTED BY THE DEPARTMENT BEFORE BEGINNING SURFACE TREATMENT.

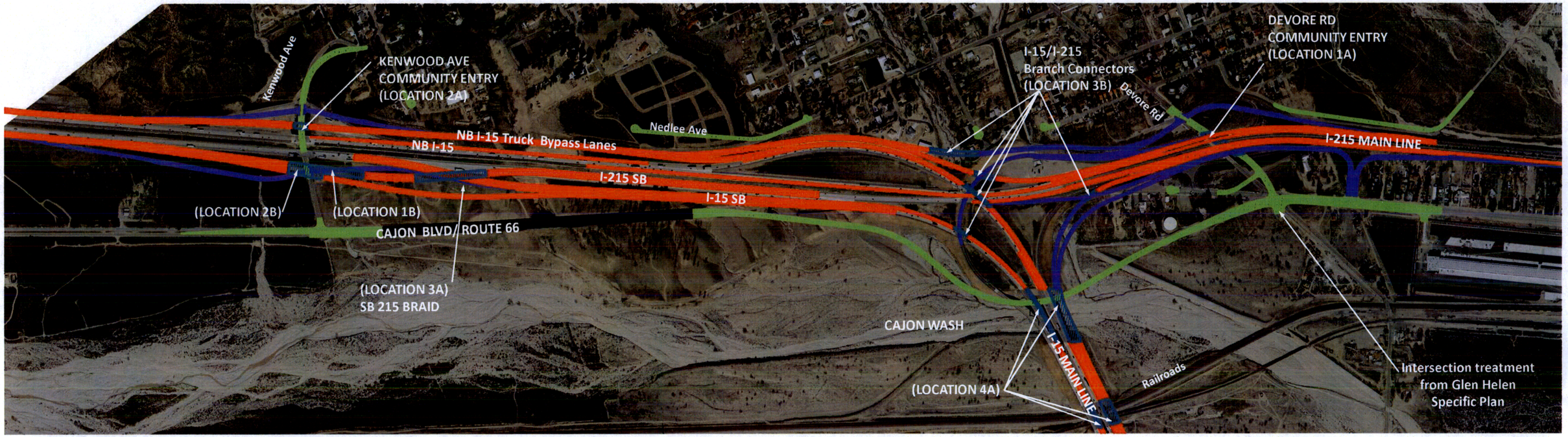


SCULPTED ROCK SHOT CRETE TEXTURE
RETAINING WALLS **FACING CAJON WASH ONLY**
ARCHITECTURAL SURFACE TREATMENT SHALL HAVE RANDOM SHADOW PATTERNS AND THE IRREGULAR FORMATIONS AND CHARACTER OF THE EXISTING GRANITE OUTCROPPINGS.

A TEST PANEL OF AT LEAST 8'X8' SHALL BE COMPLETED AT A DEPARTMENT APPROVED LOCATION AND ACCEPTED BY THE DEPARTMENT BEFORE BEGINNING SURFACE TREATMENT

Note:
This plan identifies the approximate locations of walls as shown on the base plans. Additional retaining walls that are proposed by the Design Builder and required by the Department to have aesthetic treatment will be completed at no additional increase to the contract amount. .

STRUCTURES AESTHETIC CONCEPT



NEW RAMP/CONNECTOR ROADWAY

RE-PAVE ROADWAY

NEW BRIDGES

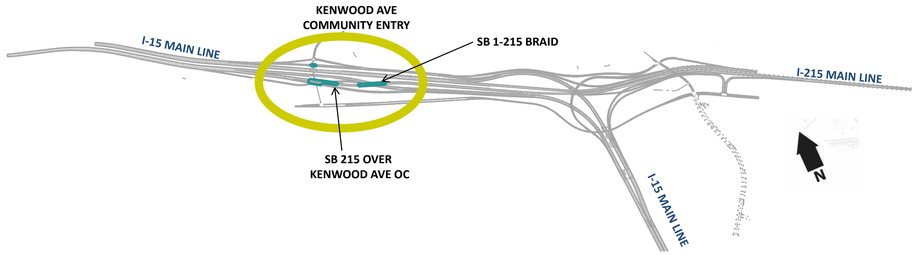
NEW LOCAL ROADWAY

NEW MAIN LINE ROADWAY

RETAINING WALL

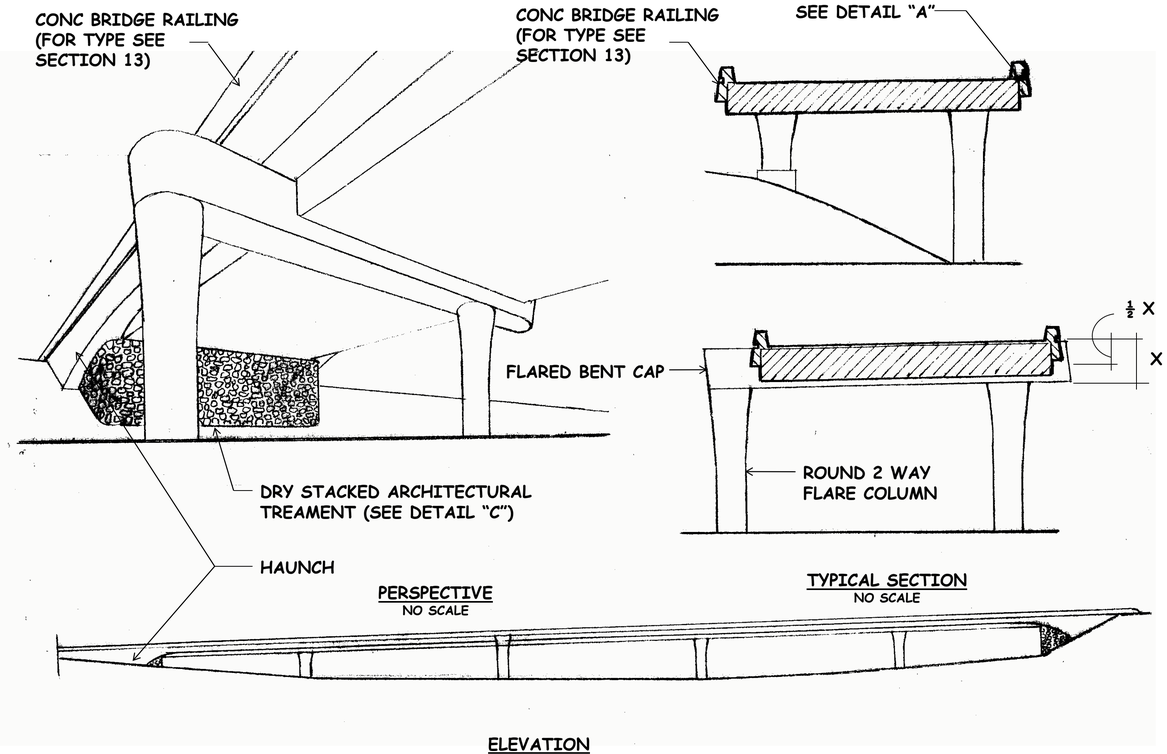
N

STRUCTURES AESTHETIC CONCEPT



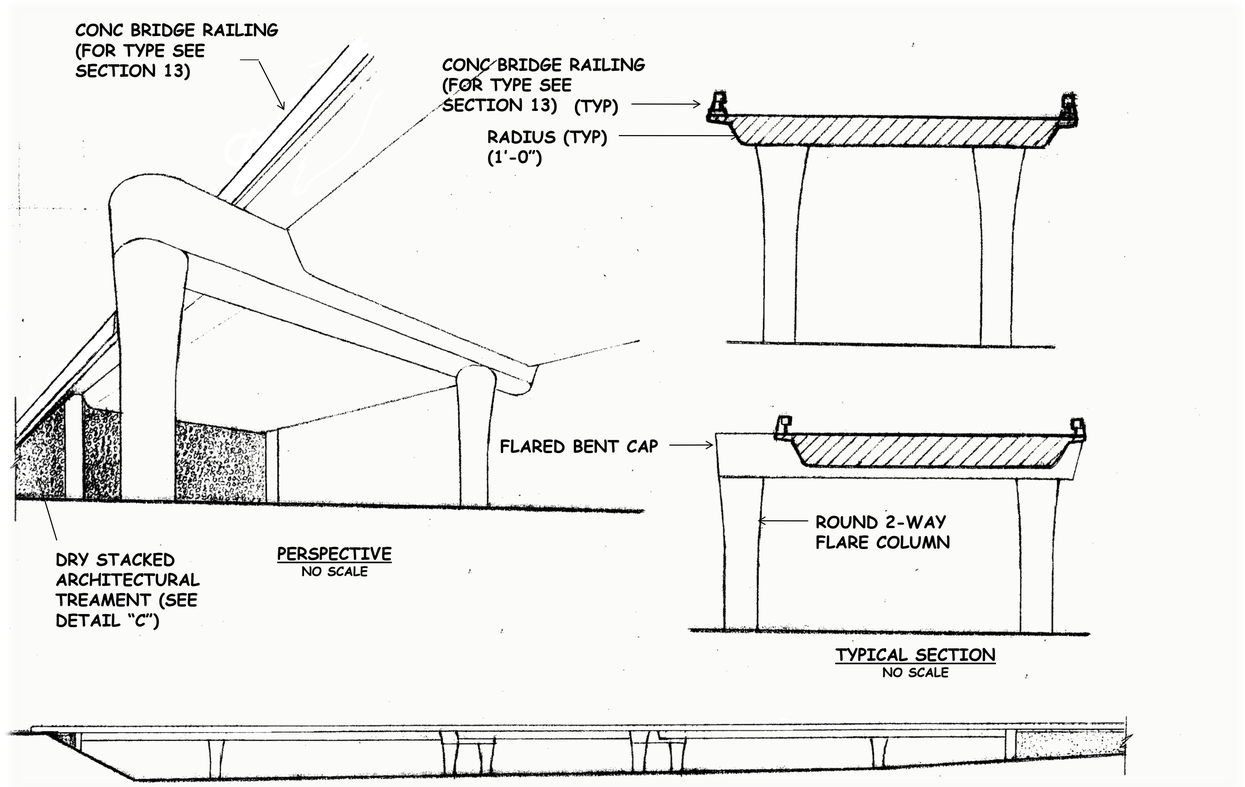
SB 215 OVER KENWOOD AVE OC
COMMUNITY ENTRY
ARCHITECTURAL REQUIREMENT

LOCATION 1B



SB I-215 BRAID
COMMUNITY ENTRY
ARCHITECTURAL REQUIREMENT

LOCATION 3A

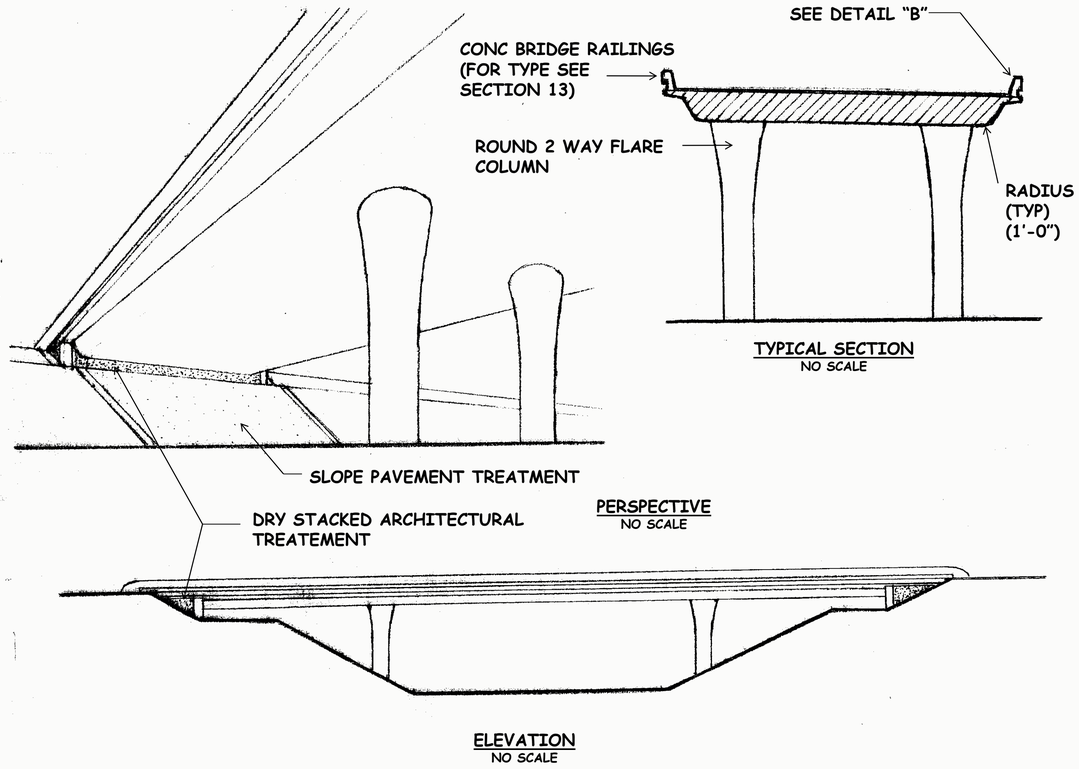


KENWOOD AVE COMMUNITY ENTRY

STRUCTURES AESTHETIC CONCEPT

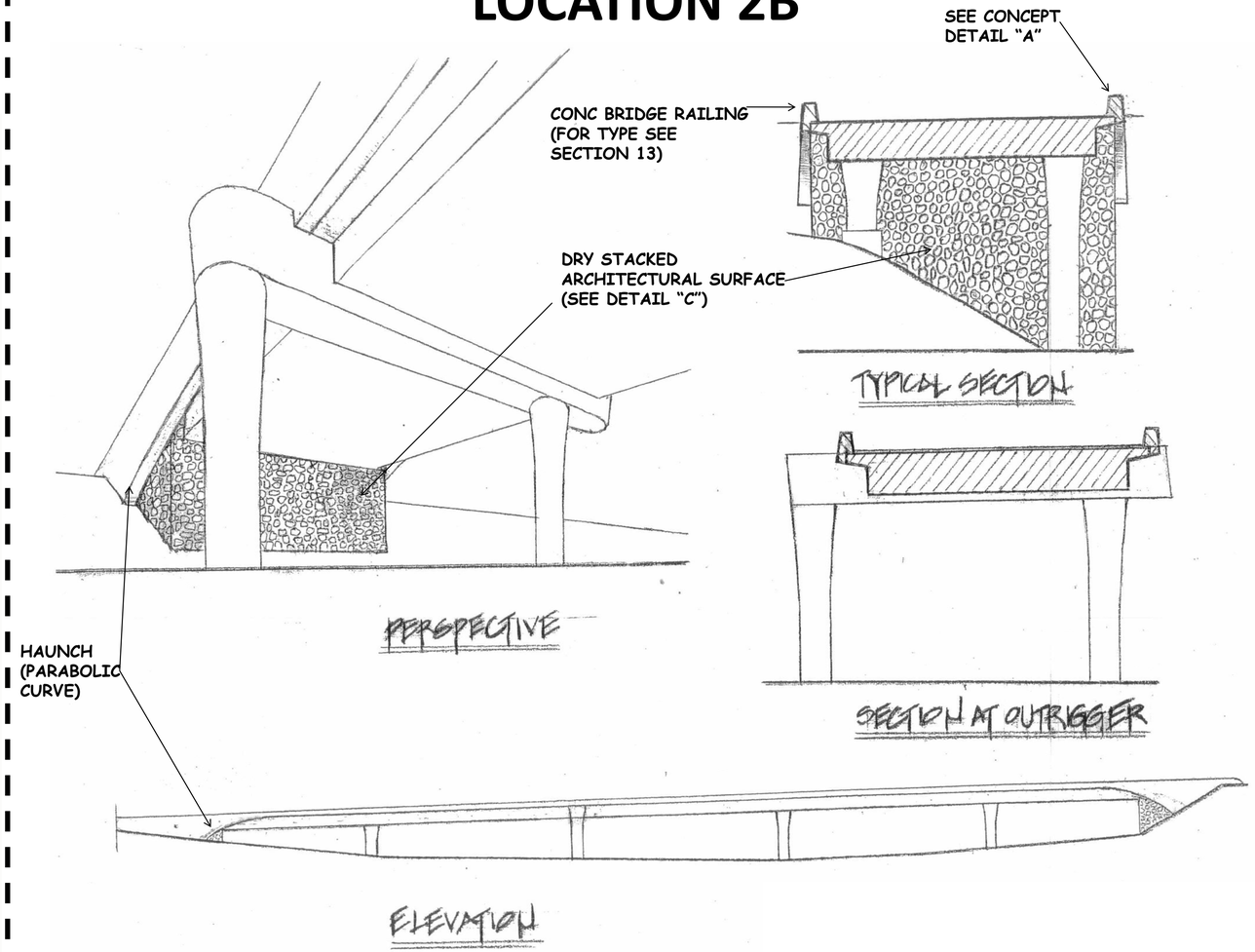
NB 15 TRUCK BYPASS OVER KENWOOD AVE O.C.
COMMUNITY ENTRY
ARCHITECTURAL REQUIREMENT

LOCATION 2A



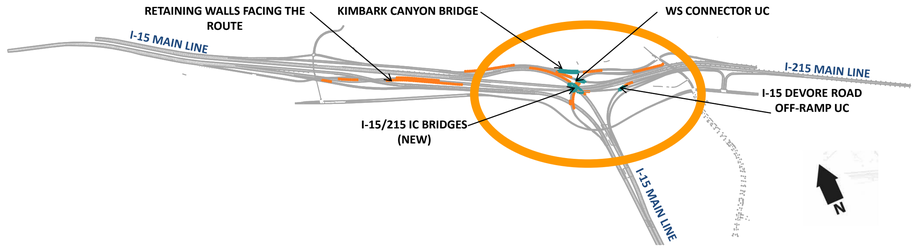
SB 15 TRUCK BYPASS OVER KENWOOD AVE OC
COMMUNITY ENTRY
ARCHITECTURAL REQUIREMENT

LOCATION 2B



KENWOOD AVE. COMMUNITY ENTRY

STRUCTURES AESTHETIC CONCEPT



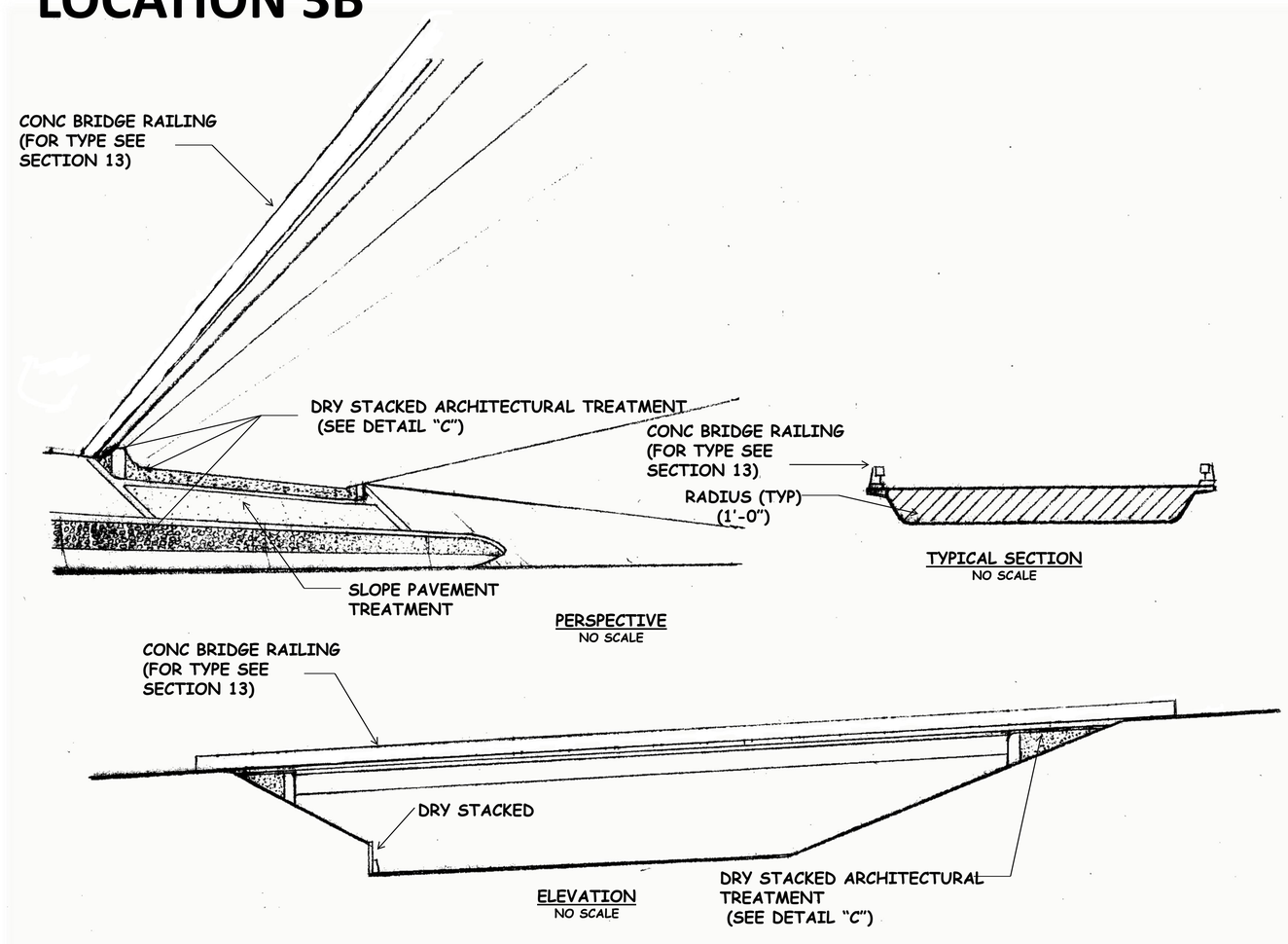
I-15/215 IC BRIDGES (NEW)

- **W/S CONNECTOR UC**
- **I-15 DEVORE ROAD OFF-RAMP UC**
- **KIMBARK CANYON BRIDGE**

ARCHITECTURAL REQUIREMENT

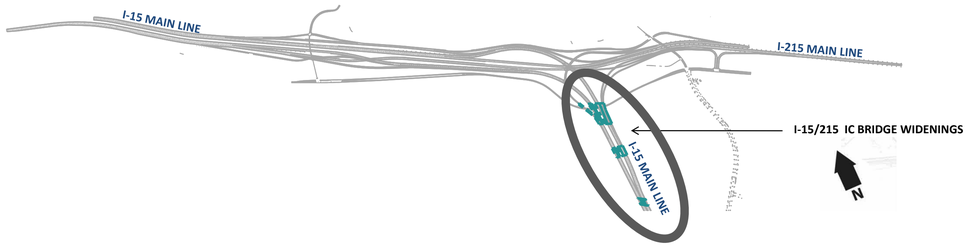
LOCATION 3B

ARCHITECTURAL SURFACE TEXTURE
WALL ELEVATION
NO SCALE



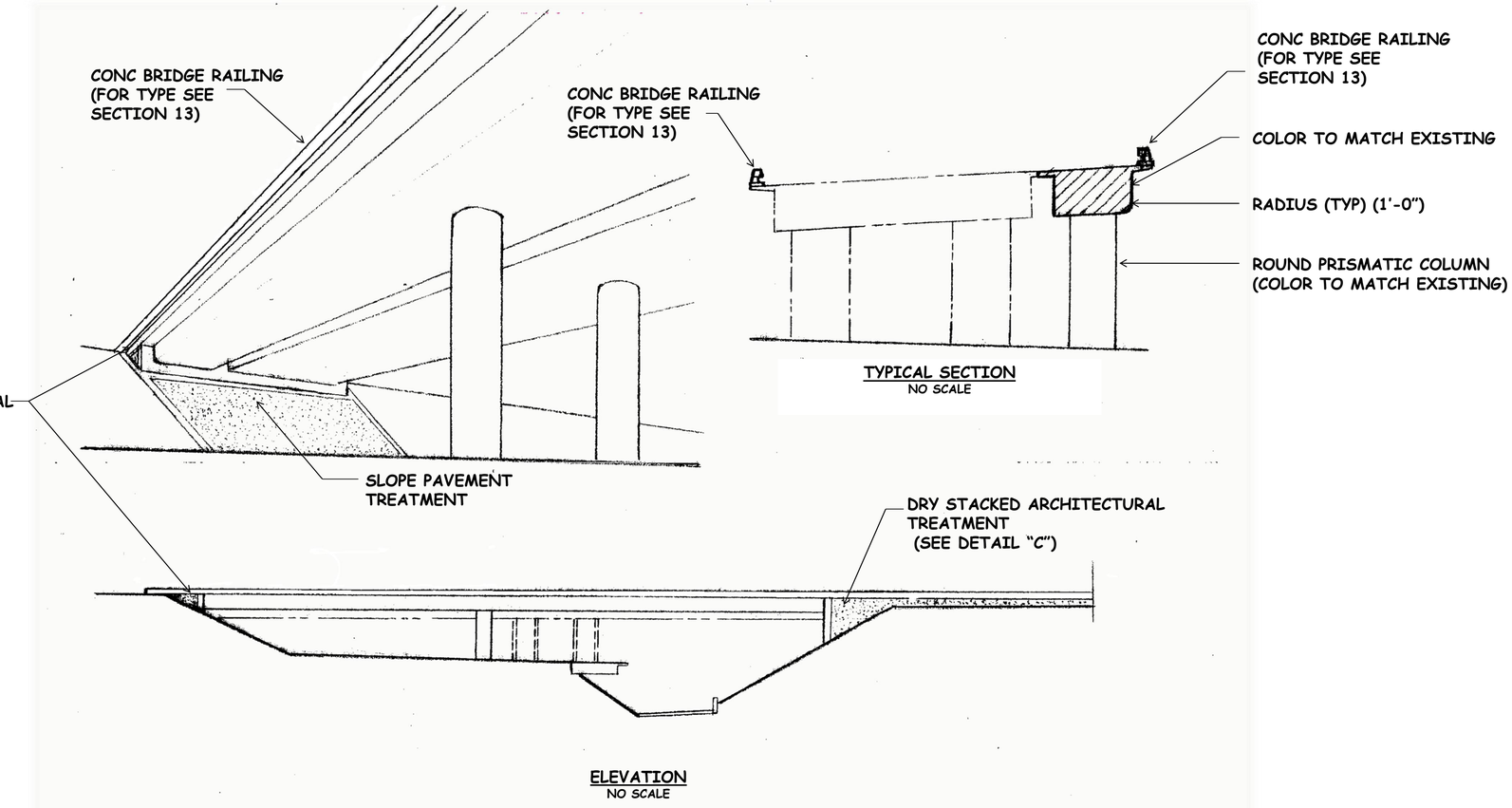
I-15/215 INTERCHANGE BRIDGES

STRUCTURES AESTHETIC CONCEPT



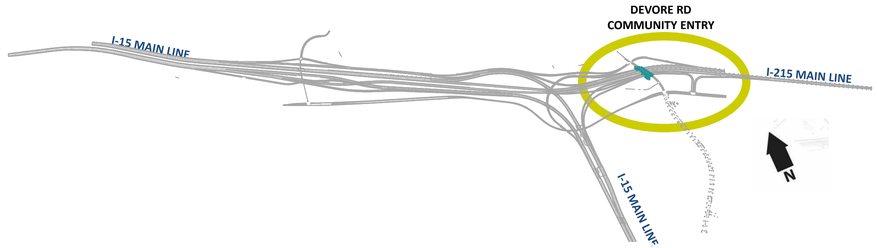
I-15/215 IC BRIDGE WIDENINGS
ARCHITECTURAL REQUIREMENT

LOCATION 4A



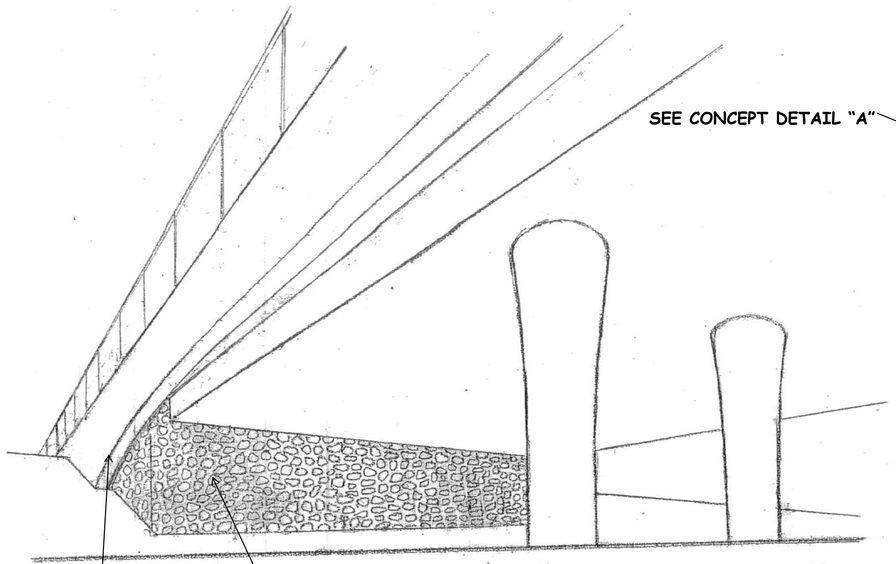
EXISTING/TO BE WIDENED

STRUCTURES AESTHETIC CONCEPT

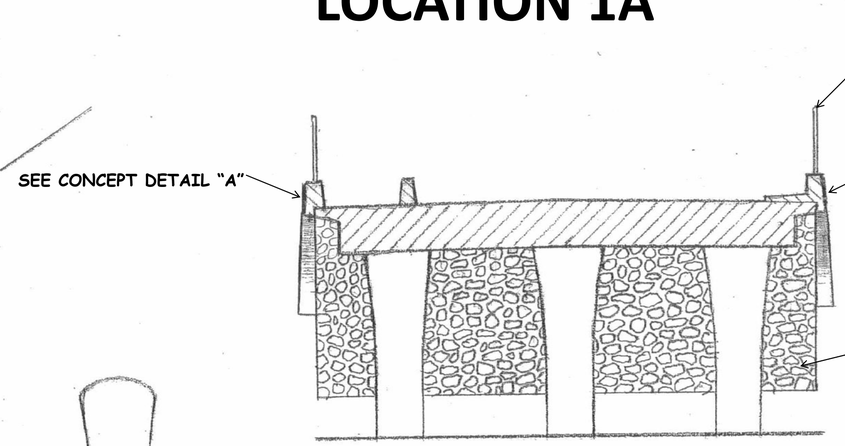


DEVORE ROAD OC COMMUNITY ENTRY
ARCHITECTURAL REQUIREMENT

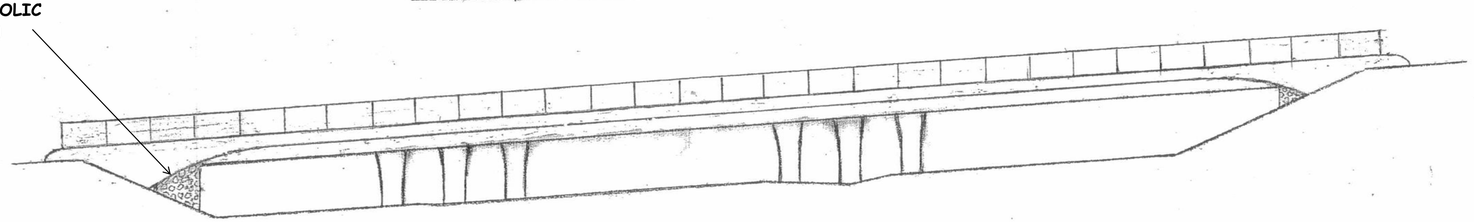
LOCATION 1A



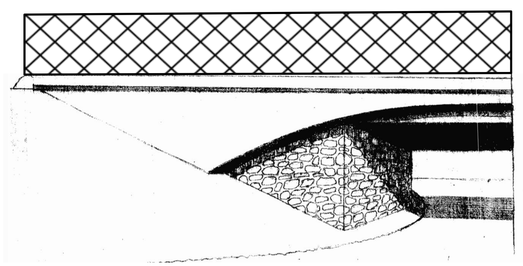
PERSPECTIVE



TYPICAL SECTION



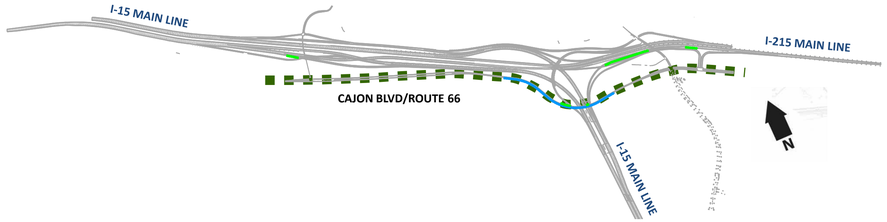
ELEVATION

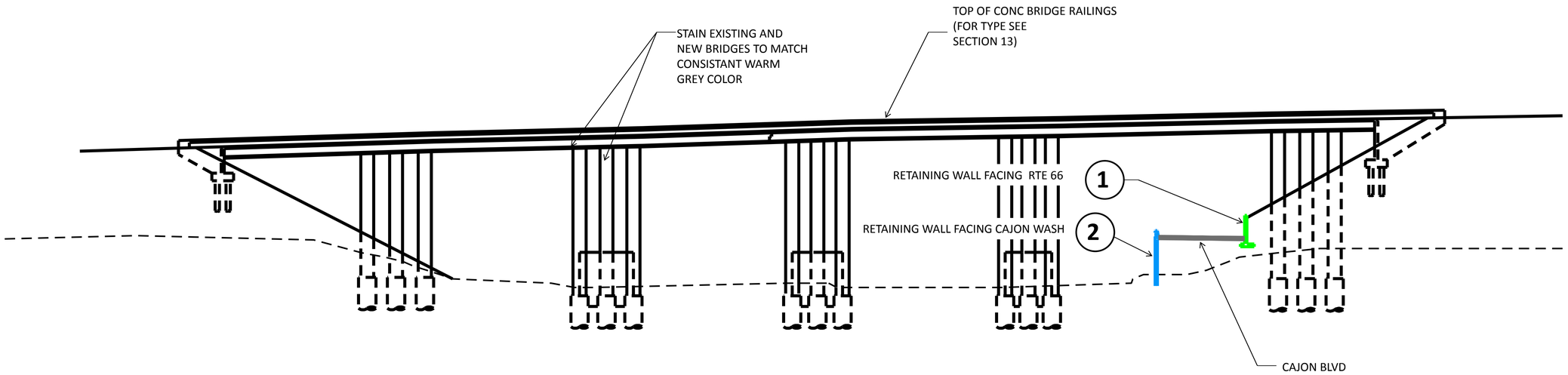


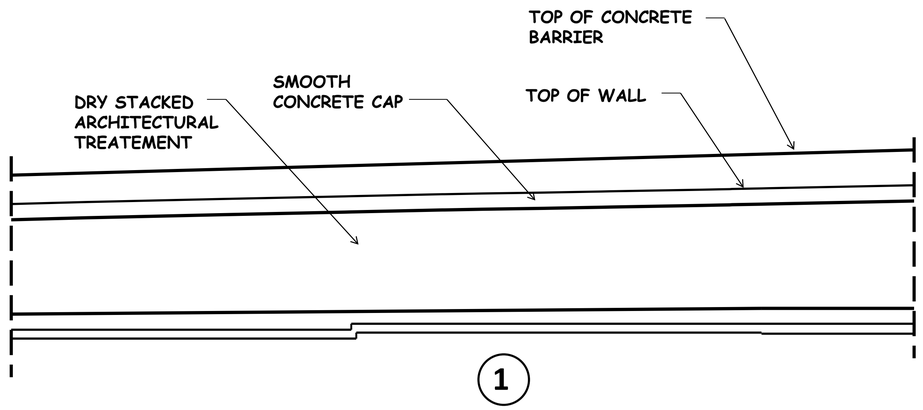
ABUTMENT/RETAINING WALL
NO SCALE

DEVORE ROAD COMMUNITY ENTRY

STRUCTURES AESTHETIC CONCEPT





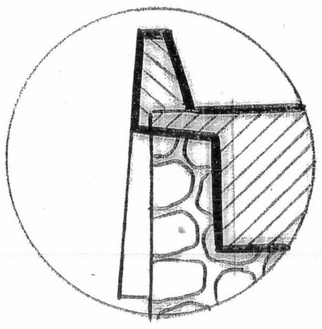


RETAINING WALL ELEVATION
NO SCALE

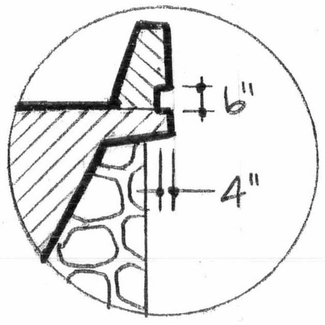
CAJON BLVD

STRUCTURES AESTHETIC CONCEPT

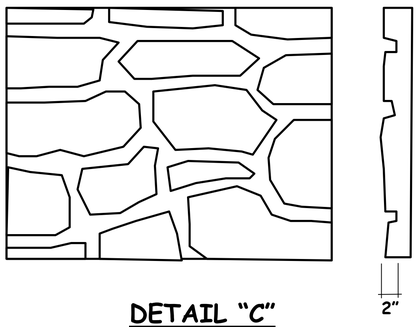
DETAILS



CONCEPT DETAIL "A"



CONCEPT DETAIL "B"



DETAIL "C"

DRY STACKED ARCHITECTUREAL TREATMENT
STONE SIZE 3" – 24"
MAXIMUM RELIEF 2"

EXHIBIT 16-A

Special Design Submittal Form

Exhibit 16-A
Special Design Submittal Form

Request for services from the Engineering Service Center
Special Designs Branch A

SIGNS AND OVERHEAD STRUCTURES

Type of Service Design ☐ Permit Review ☐ Oversight ☐ CCO

Project Location

District __ City __ Rte ____ PM _____ **EA**_____ **Permit No**._____

Structure Type or System (Check Appropriate Line)

Traffic Operations		Non-Standard Structures		Other	
MVDS	___	Truss	___	Bridge Mounted	___
VDS	___	Tubular	___	Rail/Wall Mounted	___
CCTV(HM)	___	Light Weight	___	Traffic Signals	___
HAR	___	Special Design	___	Lighting	___

Description of Request:

Remov_____

_____

Field Review (List attendees, date of review, and notes as appropriate):

_____

_____

Project Development Submittal List

1. Site layout sheets and cross sections where structure is located. ___
2. Elevation sketch drawings of structure. _
3. Location of proposed minimum vertical clearance. __
4. Description, size and weight of attachments. __

Reports and Background Information

1. Foundation Recommendations (Memo or Report Format) _____
2. Bridge Number for work on or near Bridge Structures. ___

3. Photographs (Needed for work on existing structures). _____

Proposed Project Schedule

Current Project Development Phase _

District PS and E Date ____

Request for Final Plans By __

Project Priority(Describe basis for priority and include relevant information)

_____

Notify and forward copy of request for services form to Engineering Service Center/Project Management Branch.

Signatures and Contacts **Phone #**

Project Engineer

_____ ____

Functional Unit Representatives

_____ ____

_____ ____

_____ _____

Project Manager

____ _____

Conditions and Use for Signed Project Plan Sheets

Final plan sheets are prepared in Electronic File Format ready for transfer to customer site (with District border). Signature is provided after final review by district and structures just prior to PS and E to Office Engineer. Completed and signed plan sheets shall be accompanied by Sign and Overhead Structures "Authorization For Use of Electronic Signature" form for each project. Completed and signed plan sheets shall not be revised or distributed for reuse on other projects without prior approval and electronic authorization to do so. Please refer to Signs and Overhead Structures for any updates.

EXHIBIT 16-B

Special Design Submittal Guidelines

Exhibit 16-B

Special Design Submittal Guidelines

Sign Structures

Review of sign structure submittals per the Plans Preparation Manual utilizing Caltrans Standard Plans, Special Provisions, and Standard Specifications will be 15 working days.

Non-standard sign structure submittals shall follow the specifications as provided in AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals 5th Edition.

Review of non-standard sign structure submittals will be 45 working days.

Complete sign structure submittal consists of layouts with locations, sign detail sheets, quantities, calculations, and foundation verification as needed given soil conditions.

CMS Changeable Message Signs

Review of changeable message sign structure submittals utilizing Caltrans Standard Plans, Special Provisions, and Standard specifications will be 15 working days.

Non-standard sign structure submittals shall follow the specifications as provided in AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals 5th Edition.

Review of non-standard sign structure submittals will be 45 working days.

Complete sign structure submittal consists of layouts with locations, sign detail sheets, quantities, calculations, and foundation recommendation.

Signals, Luminaries, & Traffic Items

Plan sets as provided in the Plans Prep Manual, review of signals, luminaries and traffic item submittals utilizing Caltrans Standard Plans, Special Provisions, and Standard specifications will be 15 working days.

Review of non-standard signals, luminaries, & traffic item submittals will be 45 working days.

Decorative Lighting Poles

Decorative lighting poles must be steel. Aluminum mast arms up to 4' will be allowed. Aluminum base covers will be acceptable.

Highway Advisory Radio (HAR)

Highway Advisory Radio (HAR) poles may be fiberglass provided supplemental specifications are provided.

Temporary Poles

Temporary Poles for electrical work shall comply with the specifications as provided in AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals.

EXHIBIT 16-C

Pull Box Details

10-1.09 COPPER-THEFT PREVENTION

GENERAL

Summary

This work includes installing copper theft prevention devices in pull boxes and conduits.

Submittals

Submit an equipment and material list for each installation under Section 86-1.04, "Equipment List and Drawings," of the Standard Specifications. List must include factory-tested requirements for the fittings, screws, and fastener strengths.

Submit a Certificate of Compliance for each device's materials to the Engineer under Section 6-1.07, "Certificates of Compliance," of the Standard Specifications.

Quality Control and Assurance

At the end of the project, supply the Engineer with the specialty tools including bits, drivers, and wrenches required for installing and removing tamper resistant bolts and screws. You must not keep a duplicate of the specialty tools.

Warranty

Devices must have a written warranty against defects in materials and workmanship from the manufacturer for 1 year from the date of original shipment.

MATERIALS

General

The State will furnish pad locks. Notify the Engineer 15 days before use.

Pull Box Security

If a vandal-resistant insert is fitted inside the pull box or if a security lid or cover is affixed to a pull box with a tamper-resistant lock, the insert, lid, cover, and lock must be:

1. Made of corrosion resistant material
2. Easy to handle and install
3. Easy to remove by authorized staff

If tamper-resistant bolts or security screws are used, the size and length must be similar to the hold-down bolts shown and must be compatible to the pull box.

CONSTRUCTION

Pull Box Security

Method used must:

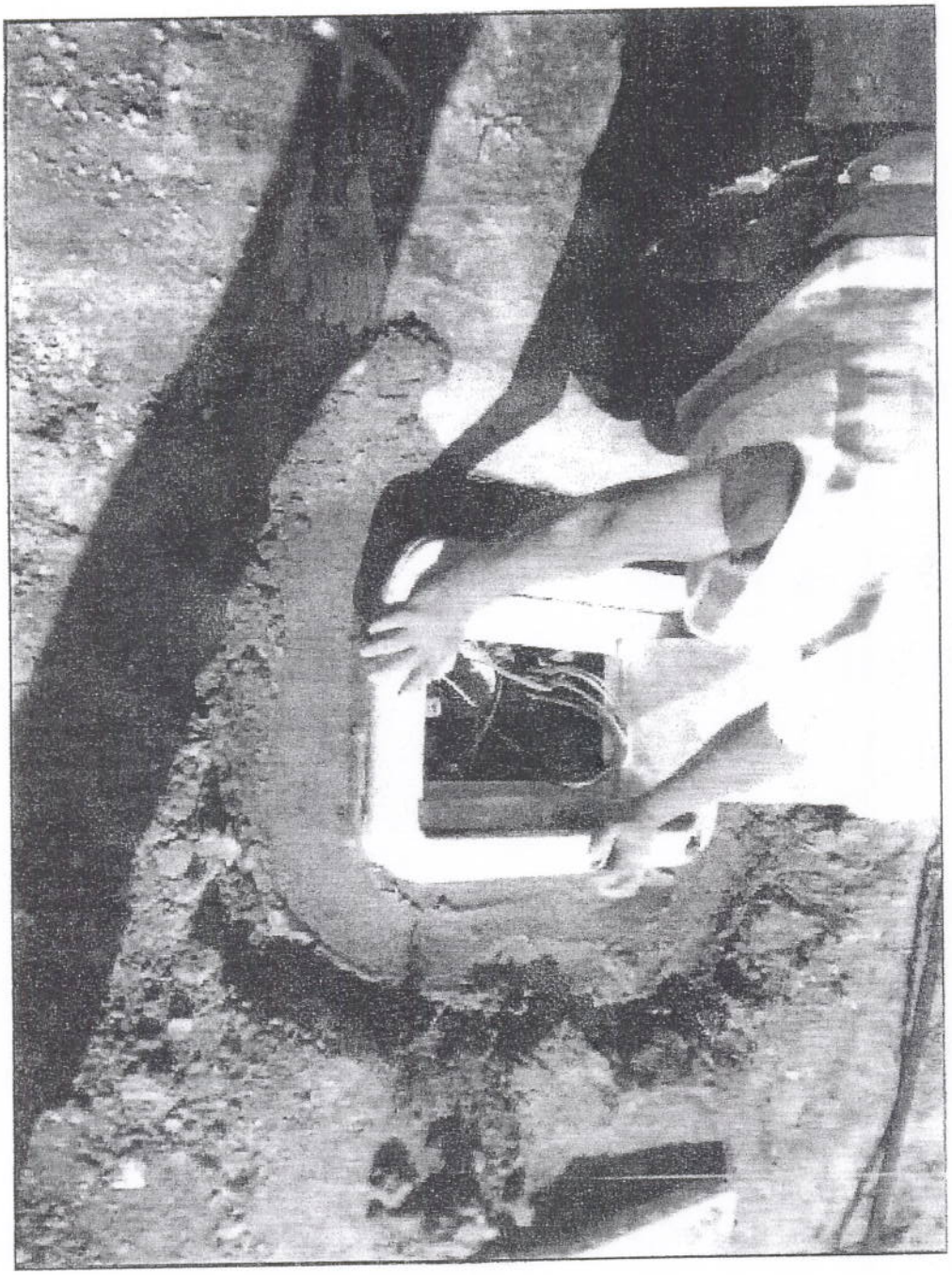
1. Be appropriate and compatible to the pull box type shown
2. Maintain:
   - 2.1. Materials associated with the pull box in tact
   - 2.2. Dimensions of the pull box
   - 2.3. Sufficient space for conduit and conductors inside the pull box
3. Lock the pull box
4. Resist unauthorized removal of wires from the pull box
5. Not interfere with ADA requirements

To make the pull box vandal resistant, you may replace or modify the pull box cover.

If the pull box cover is replaced, you must properly secure the replacement to the pull box to prevent unauthorized access.

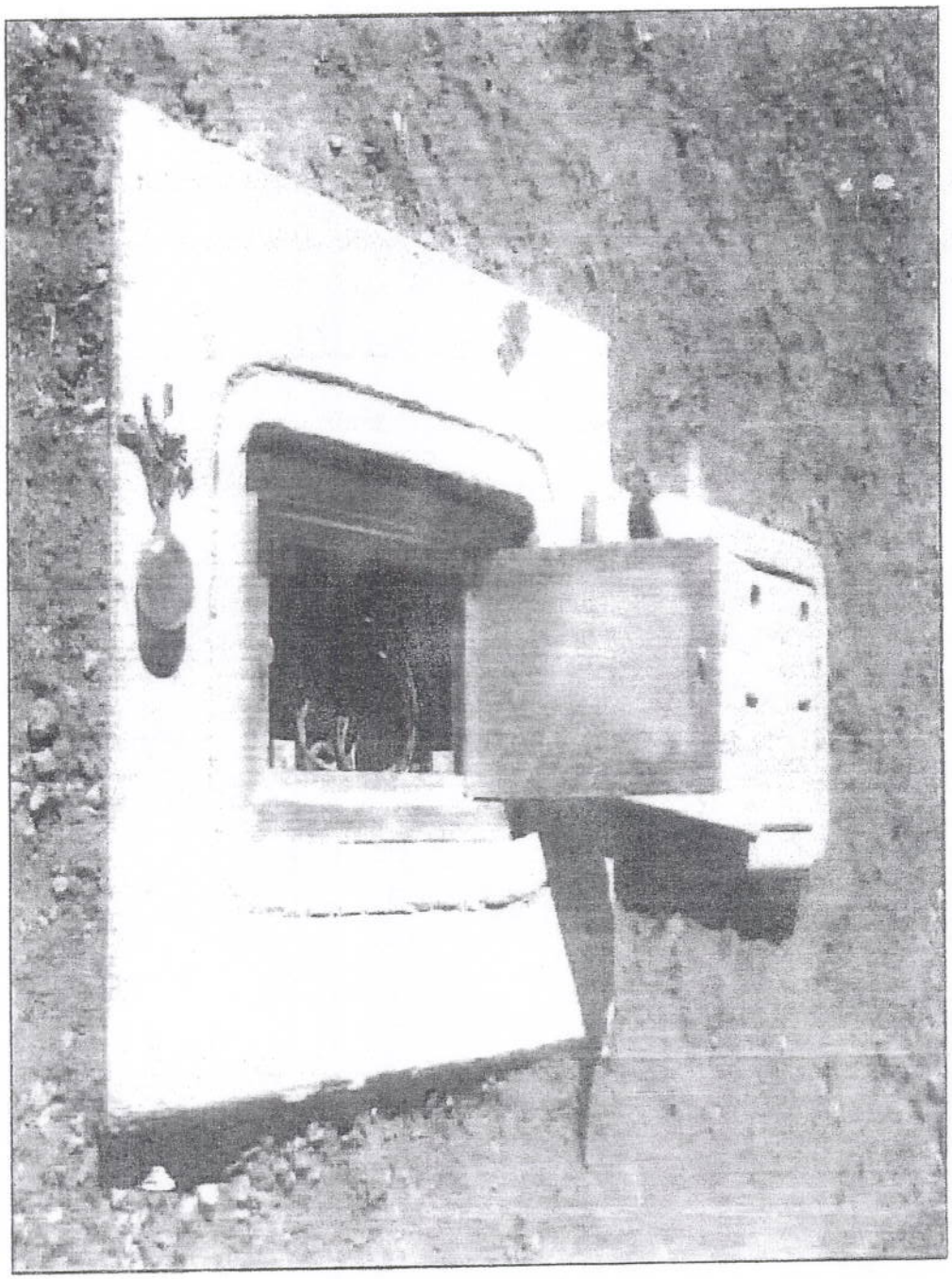
11243

Exhibit 16-C: Pull Box Details

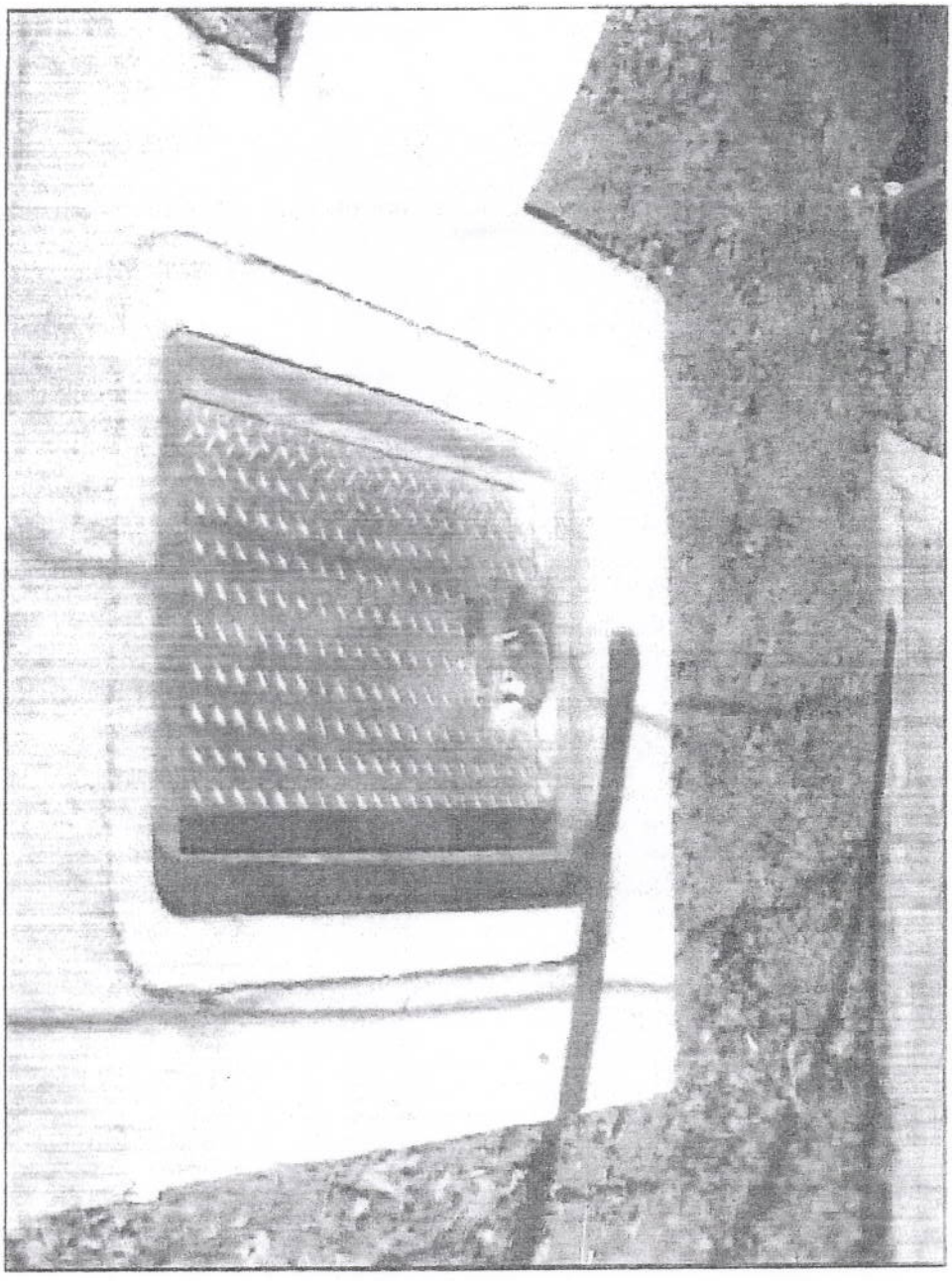


"The Lockable Insert"

Single Source Innovations, LLC



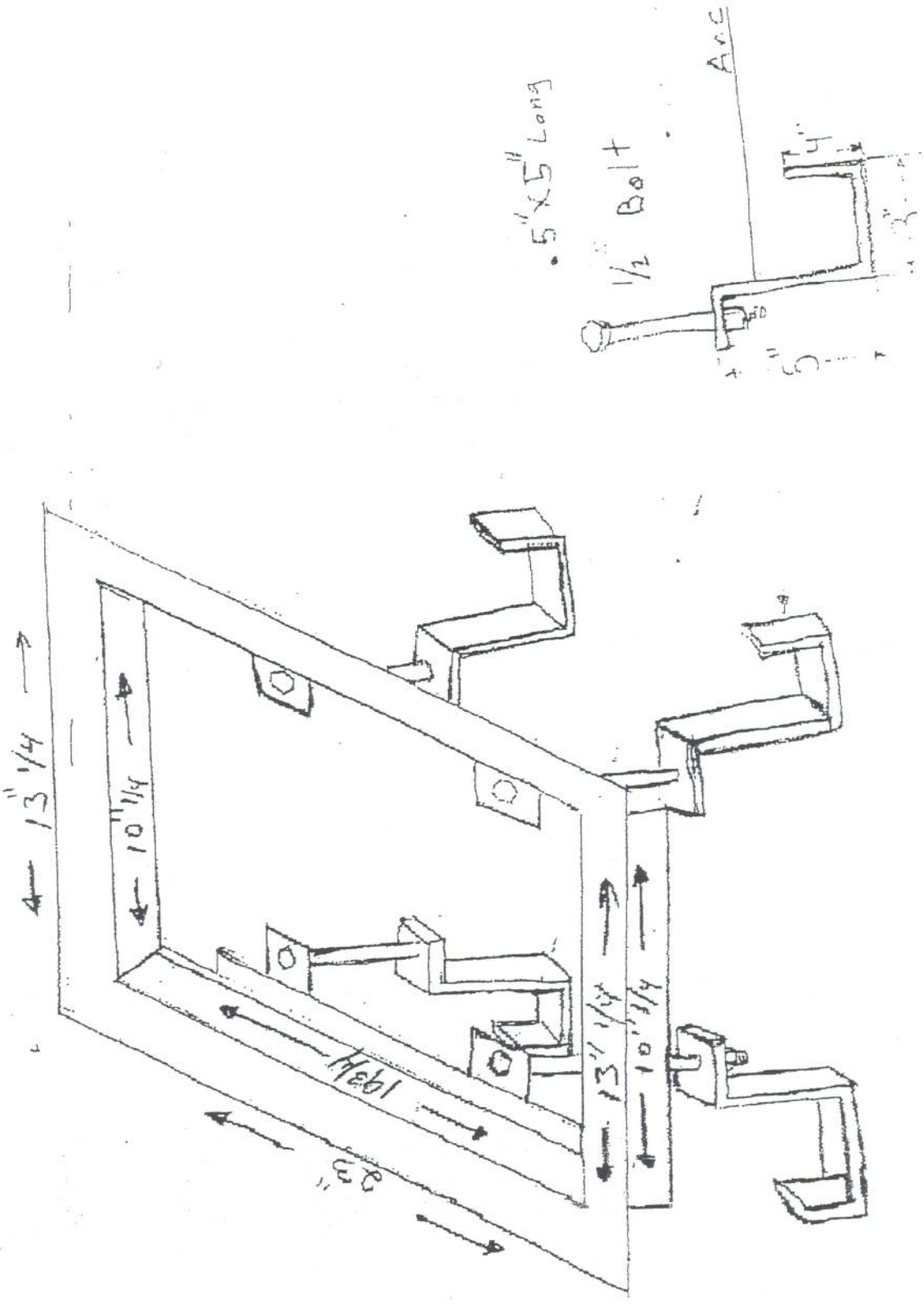
"The Lockable Insert"



"The Lockable Insert"

Single Source Innovations, LLC

Exhibit 16-C: Pull Box Details



P/B 5

EXHIBIT 16-D

Sign Retro-Reflectivity Chart

Exhibit 16-D: Sign Retro Reflectivity Chart

Basic Guide for Selection of Retroreflective ASTM Sheetings on State Highway Signs

		Glass Bead		Microprismatic				Protective Film	
	Luminance----->	Warm	Hot	Very Hot				Clear	
Category	Color Combo	Type II	Type III	Type IV	Type VII	Type VIII	Type IX	Standard	Premium
Guide	WHITE ON GREEN	DNU	NR	RS, OH	RS, OH	RS, OH	RS, OH	NR	X
Guide	WHITE ON BLUE	RS	RS	NR	NR	NR	NR	NR	X
Guide	WHITE ON BROWN	RS	RS	NR	NR	NR	NR	NR	X
Warning	BLACK ON YELLOW	DNU	RS	RS, OH	RS, OH	RS, OH	RS, OH	NR	X
Warning	[1] BLACK ON FYG	DNU / NA	RS / NA	RS	RS / NA	RS	RS	NR	X
Temporary	BLACK ON ORANGE	DNU	RS	RS	RS	RS	RS	X	X
Temporary	[2] BLACK ON FRO	DNU / NA	RS / NA	RS	RS	RS	RS / NA	X	X
Regulatory	BLACK ON WHITE	DNU	RS	RS, OH	RS, OH	RS, OH	RS, OH	X	X
Regulatory	WHITE ON RED	DNU	DNU	RS	RS	RS	RS	NR	X
Regulatory	[3] RED ON WHITE	RS	NR	NR	NR	NR	NR	X	NR
Regulatory	[3] GREEN ON WHITE	RS	NR	NR	NR	NR	NR	X	NR
Other	[4] NON-TCD SIGNS	RS	NR	NR	NR	NR	NR	X	NR

LEGEND:

- **RS** = OK on roadside signs
- **OH** = OK on overhead signs
- **DNU** = Do Not Use
- **NR** = No Recommendation
- **NA** = Not Available
- **FYG** = Fluorescent Yellow Green
- **FRO** = Fluorescent Orange or Fluorescent Red Orange

FOOTNOTES:

(1) Optional for school zones and pedestrian crossings.

(2) Optional -- Fluorescent orange is a color that appears brighter in daylight and twilight.

(3) Parking type signs.

(4) E.G., Adopt-A-Highway, Click It Or Ticket, Report Drunk Drivers, etc.

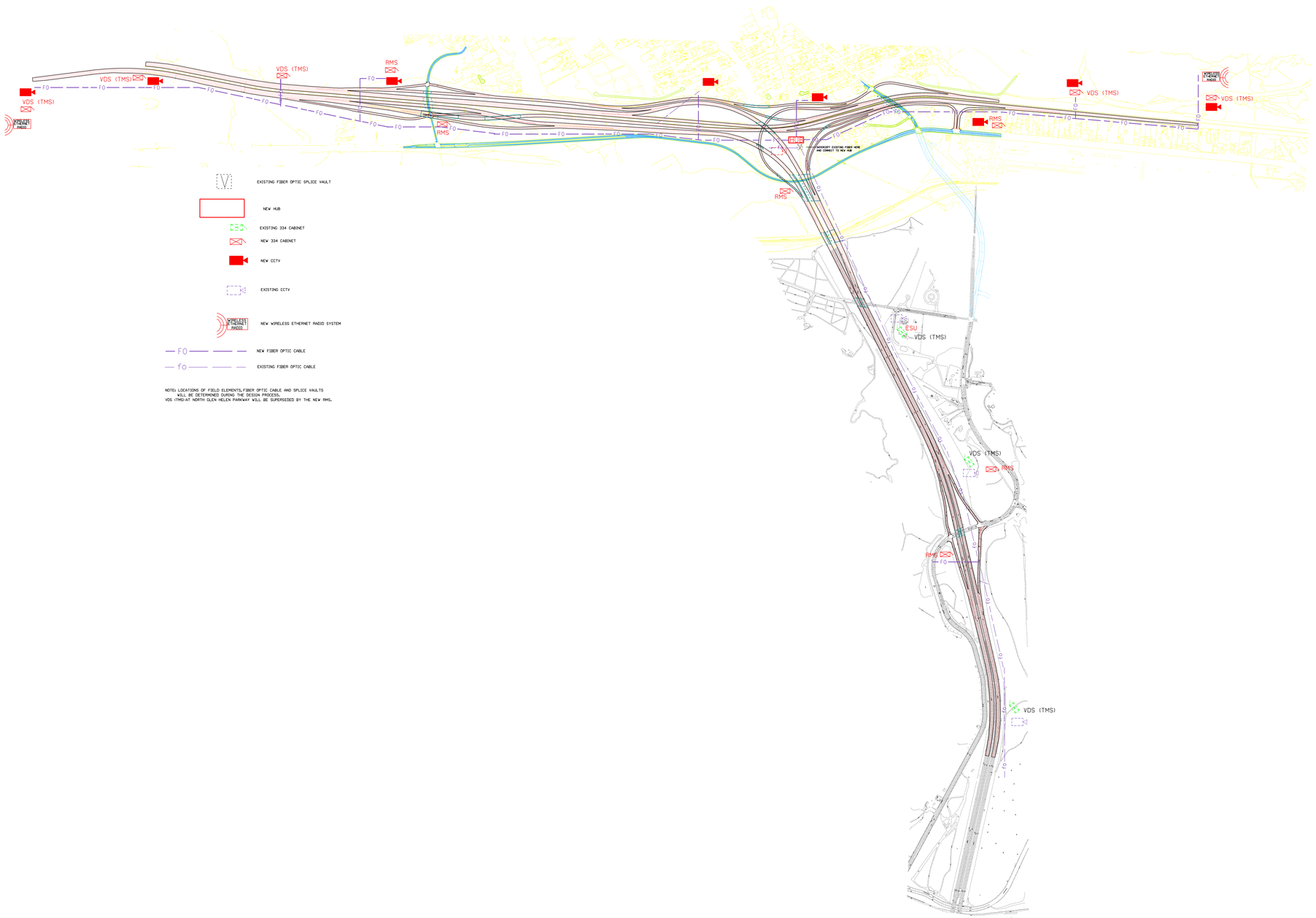
NOTES:

1. Glass bead white sheeting looks grayish in daylight.
2. Use same "Type" for legend & background on same sign.
3. Black is non-reflective and does not have an ASTM designation.

EXHIBIT 17-A

Preliminary Draft ITS Components Drawing

PRELIMINARY ITS COMPONENTS



NOTE: LOCATIONS OF FIELD ELEMENTS,FIBER OPTIC CABLE AND SPLICE VAULTS
WILL BE DETERMINED DURING THE DESIGN PROCESS.
VDS (TMS) AT NORTH GLEN HELEN PARKWAY WILL BE SUPERSEDED BY THE NEW RMS.

EXHIBIT 18-A

Lane Closure Requirements Charts

Exhibit 18-A

Lane Requirement Charts

Chart No. 1
EA#: 0K7100
Freeway/Expressway Lane Requirements

County: San Bernardino	Route/Direction: 15/nb	PM: 14.0-R16.4

Closure Limits: 2 lane section (PM: R13.779-R14.275)

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays	1	1	1	1																					1
Fridays																									
Saturdays	1	1	1	1																					
Sundays	1	1	1	1	1	1																			1

Legend:

1	Provide at least one through freeway lane open in direction of travel
	Work permitted within project right of way where shoulder or lane closure is not required.

REMARKS:

Date: 2/25/2011 Developed by: ct/sy Validity: 18 months

Chart No. 2
EA#: 0K7100
Freeway/Expressway Lane Requirements

County: San Bernardino	Route/Direction: 15/nb	PM: 14.0-R16.4

Closure Limits: 3 lane section (PM: 14.50-16.374)

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays	1	1	1	1	2	2																2	2	1	
Fridays																									
Saturdays	1	1	1	1	2	2																		2	
Sundays	1	1	1	1	1	1	2	2														2	2	1	

Legend:

1	Provide at least one through freeway lane open in direction of travel
2	Provide at least two adjacent through freeway lanes open in direction of travel
	Work permitted within project right of way where shoulder or lane closure is not required.

REMARKS:

Date: 2/25/2011 Developed by: ct/sy Validity: 18 months

Chart No. 3
EA#: 0K7100
Freeway/Expressway Lane Requirements

County: San Bernardino	Route/Direction: 15/nb	PM: 14.0-R16.4

Closure Limits: 4 lane section (PM: 14.00-14.50)

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays	1	1	1	1	2	2															3	2	2	1	
Fridays																									
Saturdays	1	1	1	1	2	2	3	3													3	3	3	2	
Sundays	1	1	1	1	1	1	2	2													3	2	2	1	

Legend:

1	Provide at least one through freeway lane open in direction of travel
2	Provide at least two adjacent through freeway lanes open in direction of travel
3	Provide at least three adjacent through freeway lanes open in direction of travel
	Work permitted within project right of way where shoulder or lane closure is not required.

REMARKS:

Date: 2/25/2011 Developed by: ct/sy Validity: 18 months

Chart No. 4
EA#: 0K7100
Freeway/Expressway Lane Requirements

County: San Bernardino	Route/Direction: 15/nb	PM: 14.0-R16.4

Closure Limits: 5 lane section (PM: R14.273-R16.40)

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays	1	1	1	1	2	2														4	3	2	2	1	
Fridays																									
Saturdays	1	1	1	1	2	2	3	3												4	3	3	3	2	
Sundays	1	1	1	1	1	1	2	2												4	3	2	2	1	

Legend:

1	Provide at least one through freeway lane open in direction of travel
2	Provide at least two adjacent through freeway lanes open in direction of travel
3	Provide at least three adjacent through freeway lanes open in direction of travel
4	Provide at least four adjacent through freeway lanes open in direction of travel
	Work permitted within project right of way where shoulder or lane closure is not required.

REMARKS:

Date: 2/25/2011 Developed by: ct/sy Validity: 18 months

Chart No. 5
EA#: 0K7100
Freeway/Expressway Lane Requirements

County: San Bernardino	Route/Direction: 215/nb	PM: 16.0-17.8

Closure Limits:

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays	1	1	1	1	1																1	1	1	1	
Fridays																									
Saturdays	1	1	1	1	1	1																1	1	1	
Sundays	1	1	1	1	1	1	1	1													1	1	1	1	

Legend:

1	Provide at least one through freeway lane open in direction of travel
	Work permitted within project right of way where shoulder or lane closure is not required.

REMARKS:

Date: 2/25/2011 Developed by: ct/sy Validity: 18 months

Chart No. 6
EA#: 0K7100
Freeway/Expressway Lane Requirements

County: San Bernardino	Route/Direction: 15/sb	PM: 14.0-R16.4

Closure Limits: 2 lane section (PM: R14.048)

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays																								1	1
Tuesdays through Thursdays	1	1																						1	1
Fridays	1	1																							1
Saturdays	1	1	1	1																					
Sundays																									

Legend:

1	Provide at least one through freeway lane open in direction of travel
	Work permitted within project right of way where shoulder or lane closure is not required.

REMARKS:

Date: 2/25/2011 Developed by: ct/sy Validity: 18 months

Chart No. 7
EA#: 0K7100
Freeway/Expressway Lane Requirements

County: San Bernardino	Route/Direction: 15/sb	PM: 14.0-R16.4

Closure Limits: 3 lane section (PM: R13.779-R14.048, 14.50-16.374)

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays																				2	2	2	1	1	
Tuesdays through Thursdays	1	1	2																	2	2	2	1	1	
Fridays	1	1	2																			2	2	1	
Saturdays	1	1	1	1	2																		2	2	
Sundays																									

Legend:

1	Provide at least one through freeway lane open in direction of travel
2	Provide at least two adjacent through freeway lanes open in direction of travel
	Work permitted within project right of way where shoulder or lane closure is not required.

REMARKS:

Date: 2/25/2011 Developed by: ct/sy Validity: 18 months

Chart No. 8
EA#: 0K7100
Freeway/Expressway Lane Requirements

County: San Bernardino	Route/Direction: 15/sb	PM: 14.0-R16.4

Closure Limits: 4 lane section (PM: R14.787-R16.40, 14.00-14.50)

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays																				2	2	2	1	1	
Tuesdays through Thursdays	1	1	2	3																2	2	2	1	1	
Fridays	1	1	2	3																3	3	2	2	1	
Saturdays	1	1	1	1	2	3														3	3	3	2	2	
Sundays																									

Legend:

1	Provide at least one through freeway lane open in direction of travel
2	Provide at least two adjacent through freeway lanes open in direction of travel
3	Provide at least three adjacent through freeway lanes open in direction of travel
	Work permitted within project right of way where shoulder or lane closure is not required.

REMARKS:

Date: 2/25/2011 Developed by: ct/sy Validity: 18 months

Chart No. 9
EA#: 0K7100
Freeway/Expressway Lane Requirements

County: San Bernardino	Route/Direction: 15/sb	PM: 14.0-R16.4

Closure Limits: 6 lane section (PM: R14.048-R14.787)

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays																		4	3	2	2	2	1	1	
Tuesdays through Thursdays	1	1	2	3																2	2	2	1	1	
Fridays	1	1	2	3															4	3	3	2	2	1	
Saturdays	1	1	1	1	2	3	4												4	3	3	3	2	2	
Sundays																									

Legend:

1	Provide at least one through freeway lane open in direction of travel
2	Provide at least two adjacent through freeway lanes open in direction of travel
3	Provide at least three adjacent through freeway lanes open in direction of travel
4	Provide at least four adjacent through freeway lanes open in direction of travel
	Work permitted within project right of way where shoulder or lane closure is not required.

REMARKS:

Date: 2/25/2011 Developed by: ct/sy Validity: 18 months

Chart No. 10
EA#: 0K7100
Freeway/Expressway Lane Requirements

County: San Bernardino	Route/Direction: 215/sb	PM: 16.0-17.8

Closure Limits:

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays																			1	1	1	1	1	1	
Tuesdays through Thursdays	1	1	1	1															1	1	1	1	1	1	
Fridays	1	1	1	1																1	1	1	1	1	
Saturdays	1	1	1	1	1	1	1													1	1	1	1	1	
Sundays																									

Legend:

1	Provide at least one through freeway lane open in direction of travel
	Work permitted within project right of way where shoulder or lane closure is not required.

REMARKS:

Date: 2/25/2011 Developed by: ct/sy Validity: 18 months

Chart No. 11
EA#: 0K7100
Complete Freeway Closure Hours

County: San Bernardino	Route/Direction: 15/nb	PM: 14.0-R16.4

Closure Limits:

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays																									
Fridays																									
Saturdays																									
Sundays																									

Legend:

C	Freeway or expressway may be closed completely.
	No complete freeway or expressway closure is permitted.

REMARKS: A total of 2 nights of full closure shall take place for falsework and bridge overhead signs.

Date: 2011 Developed by: LCRC Validity: 18 months

Chart No. 12
EA#: 0K7100
Complete Freeway Closure Hours

County: San Bernardino	Route/Direction: 215/nb	PM: 14.0-R16.4

Closure Limits:

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays	C	C	C	C																		C	C	C	
Fridays																									
Saturdays	C	C	C	C	C	C																			C
Sundays	C	C	C	C	C	C	C															C	C	C	

Legend:

C	Freeway or expressway may be closed completely.
	No complete freeway or expressway closure is permitted.

REMARKS: A total of 7 nights of full closure shall take place for falsework and bridge overhead signs.

Date: 2/25/2011 Developed by: ct/sy Validity: 18 months

Chart No. 13
EA#: 0K7100
Complete Freeway Closure Hours

County: San Bernardino	Route/Direction: 15/sb	PM: 14.0-R16.4

Closure Limits:

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays																									
Tuesdays through Wednesdays																									
Thursdays through Fridays																									
Saturdays																									
Sundays																									

Legend:

C	Freeway or expressway may be closed completely.
	No complete freeway or expressway closure is permitted.

REMARKS: A total of 8 nights of full closure shall take place for falsework and bridge overhead signs.

Date: 2011 Developed by: LCRC Validity: 18 months

Chart No. 14
EA#: 0K7100
Complete Freeway Closure Hours

County: San Bernardino	Route/Direction: 215/sb	PM: 14.0-R16.4

Closure Limits:

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays																					C	C	C	C	
Tuesdays through Thursdays	C	C	C	C																	C	C	C	C	
Fridays	C	C	C	C																		C	C	C	
Saturdays	C	C	C	C	C																		C	C	
Sundays																									

Legend:

C	Freeway or expressway may be closed completely.
	No complete freeway or expressway closure is permitted.

REMARKS: A total of 8 nights of full closure shall take place for falsework and bridge overhead signs.

Date: 2/25/2011 Developed by: ct/sy Validity: 18 months

Chart No. 15
EA#: 0K7100
Complete Connector Closure Hours

County: San Bernardino	Route/Direction: 15/nb	PM: R13.9

Closure Limits: NB 15 on from NB 215 (PM R13.900)

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Wednesdays	C	C	C	C	C																	C	C	C	
Thursdays	C	C	C	C	C																				
Fridays																									
Saturdays	C	C	C	C	C	C																C	C	C	
Sundays	C	C	C	C	C	C																C	C	C	

Legend:

C	Connector may be closed completely
	Work permitted within project right of way where shoulder or lane closure is not required.

REMARKS:

Date: 2/25/2011 Developed by: ct/sy Validity: 18 months

Chart No. 16
EA#: 0K7100
Complete Connector Closure Hours

County: San Bernardino	Route/Direction: 15/nb	PM: 16.13

Closure Limits: NB 15 to SB 215 (PM 16.137)

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays	C	C	C	C	C																	C	C	C	
Fridays	C	C	C	C	C																	C	C	C	
Saturdays	C	C	C	C	C	C																C	C	C	
Sundays	C	C	C	C	C	C																C	C	C	

Legend:

C — Connector may be closed completely

Work permitted within project right of way where shoulder or lane closure is not required.

REMARKS:

Date: 2/25/2011 Developed by: ct/sy Validity: 18 months

Chart No. 17
EA#: 0K7100
Complete Connector Closure Hours

County: San Bernardino	Route/Direction: 15/sb	PM: R13.8

Closure Limits: SB 15 to SB 215 (PM R13.800)

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays																						C	C	C	
Tuesdays through Thursdays	C	C	C	C	C																	C	C	C	
Fridays	C	C	C	C	C																	C	C	C	
Saturdays	C	C	C	C	C																				
Sundays																									

Legend:

C — Connector may be closed completely

Work permitted within project right of way where shoulder or lane closure is not required.

REMARKS:

Date: 2/25/2011 Developed by: ct/sy Validity: 18 months

Chart No. 18
EA#: 0K7100
Complete Connector Closure Hours

County: San Bernardino	Route/Direction: 215/nb	PM: 17.48

Closure Limits: NB 215 to SB 15 (PM 17.489)

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays	C	C	C	C	C																	C	C	C	
Fridays	C	C	C	C	C																	C	C	C	
Saturdays	C	C	C	C	C																	C	C	C	
Sundays	C	C	C	C	C																	C	C	C	

Legend:

C Connector may be closed completely

Work permitted within project right of way where shoulder or lane closure is not required.

REMARKS:

Date: 2/25/2011 Developed by: ct/sy Validity: 18 months

Chart No. 19
EA#: 0K7100
Complete Ramp Closure Hours

County: San Bernardino	Route/Direction: 15/nb	PM: 14.0-R16.4

Closure Limits:

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Wednesdays	C	C	C	C	C	C														C	C	C	C	C	
Thursdays through Fridays	C	C	C	C	C	C																	C	C	
Saturdays	C	C	C	C	C	C	C	C												C	C	C	C	C	
Sundays	C	C	C	C	C	C	C	C												C	C	C	C	C	

Legend:

C Ramp may be closed completely

Work permitted within project right of way where shoulder or lane closure is not required.

REMARKS:

Date: 2/25/2011 Developed by: ct/sy Validity: 18 months

Chart No. 20
EA#: 0K7100
Complete Ramp Closure Hours

County: San Bernardino	Route/Direction: 215/nb	PM: 16.0-17.8

Closure Limits:

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays	C	C	C	C	C																C	C	C	C	
Fridays	C	C	C	C	C																		C	C	
Saturdays	C	C	C	C	C	C																C	C	C	
Sundays	C	C	C	C	C	C	C	C													C	C	C	C	

Legend:

C Ramp may be closed completely

Work permitted within project right of way where shoulder or lane closure is not required.

REMARKS:

Date: 2/25/2011 Developed by: ct/sy Validity: 18 months

Chart No. 21
EA#: 0K7100
Complete Ramp Closure Hours

County: San Bernardino	Route/Direction: 15/sb	PM: 14.0-R16.4

Closure Limits:

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Wednesdays	C	C	C	C																C	C	C	C	C	
Thursdays through Fridays	C	C	C	C																			C	C	
Saturdays	C	C	C	C	C	C	C													C	C	C	C	C	
Sundays	C	C	C	C	C	C	C													C	C	C	C	C	

Legend:

C Ramp may be closed completely

Work permitted within project right of way where shoulder or lane closure is not required.

REMARKS:

Date: 2/25/2011 Developed by: ct/sy Validity: 18 months

Chart No. 22
EA#: 0K7100
Complete Ramp Closure Hours

County: San Bernardino	Route/Direction: 215/sb	PM: 16.0-17.8

Closure Limits:

FROM HOUR TO HOUR	24	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Mondays through Thursdays	C	C	C	C															C	C	C	C	C	C	
Fridays	C	C	C	C																C	C	C	C	C	
Saturdays	C	C	C	C	C	C	C													C	C	C	C	C	
Sundays	C	C	C	C	C	C	C	C														C	C	C	

Legend:

C Ramp may be closed completely

Work permitted within project right of way where shoulder or lane closure is not required.

REMARKS:

Date: 2/25/2011 Developed by: ct/sy Validity: 18 months

EXHIBIT 18-B

Lane Requirement Chart Request Form

Exhibit 18-B: Lane Requirement Chart Request Form

	Caltrans (District 08)	Following 2 cells are for DTM use.
	Lane Requirement Chart (LRC) Request (Updated on 2/4/2009)	Count station:
LRC Developer:	To be submitted through e-mail	Truck % :

TYPE INFORMATION IN GREEN CELLS ONLY

A) Requester's information

Full name			**Department**		
phone No.		Floor & geo. Location:(e.g.: 10 NE) >>>>>	Date of request		
E-mail add.:			**Project's EA #**		
Name of the project manager of this job			Project manager's E-mail address		

B) Job description (See section "E" below)

Do not combine requests **(One request for each roadway or county)**

Job description			
Job ID (County/route)		Post mile (from-to). see PM log address below*	
Directions (Don't say both)		# of lns. existing **in each direc.****, read note 2	
* For exact pm go to http://sv08web/databank & select county & type rte.		**Attach the location map to your E-mial**	
Name of the intersecting roads in the beginning and at the end (If any)			
Will any ramp/connec. be clsd?	**if yes** read note 1 below*	If any city street needs to be closed, read note 3 below ***	

Note1 *: If ramps or connectors are needed to be closed, click on the "ramp or connector info" tab below & complete the list

Note 2 **: If # of lanes change within the limits of the project, click on the "# of lanes" tab below & complete the list

Note 3 ***: If any city streets, or roads that are not under the jurisdiction of Caltrans, need to be closed, the requester must obtain the written approval of the closure from the corresponding local agency and provide it to the DTM, at the time of requesting the LRCs.

C) Project information (Consult with cons./Mntc., if assistance is needed)

Type: Cons/Mntc/Permits:	**LRC Developer**: Calculate the 10 minute delay damage
What is the Ready To List **(RTL) date?**	
What is the **expected date** of **construction?**	
How many lanes are required to be closed in each direction to be able to perform the job?	
Which lanes will the job be performed on (If any)? Specify lane numbers (If all state "All")	
For 2 lanes or more roadways, are **any full directional closures** required? **If Yes,** give the # of times and the exact PM limits?	
Have extended weekend closures been considered? If yes how many?	
How many working days are needed for the job **to be completed** under normal conditions?	
What is the **minimum No. of hours** required **per shift** to do the job?	
Considering the traffic, what are the **best hours** to perform the job (0-24) if you know?	
Have major traffic **detours** been planned? If "**Yes**", **give % diversion & Attach the detour plan to your E-mail**	
If "**No**", What will be done with the traffic? Explain in section "E" below	

D) Roadway information

Any K-rail installed? If yes, on which side?		K-rail will be placed between which PM's?	
What will be the lane width when k-railed?		Is **profile grade** level/rolling/mountaineous?*	

*: If the profile grades change within the postmile limits of the project, click on the "Profile grade" tab below & complete the list

Width of outside shoulder in feet (if exists)?		Width of inside/median shoulder in feet(if exists)?	

Note: LRC's will be ready in 2-4 weeks, approximately.

E) Write any remarks, details of the job description or detour route in this section

E-mail the completed form to: al_afaneh@dot.ca.gov		Date request received by the DTM	

List of ramp/connector closures corresponding to the roadway closure

	EA Number	0			Request date	01/00/00		
	Job ID (County/rte)							
	Postmile (From-to) *	0.00						
	* For exact pm go to http://sv08web/databank & select county & type rte. #							
#	Direct. of connector or ramp (eb/wb/nb/sb)	Is it a connec., Onr/ofr?	PM prefix (If any)	Postmile	# of exist. Lns on the connec./ramp	# of ramp lns. To be closed	Type of work to be done	Remarks
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								

Only the form, was developed by Saleh Yadegari (2/3/09)

List of # of existing lanes on the mainline

	EA Number	**0**	Request date	**01/00/00**
	ID (County/rte)			
	Postmile (from-to)		**0**	

#	Direction (eb/wb/nb/sb)	Pm (From)	Pm (To)	# of existing lanes	Remarks
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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List of profile grades

	EA Number		**0**		Today's date	**01/00/00**	
	Job ID (county/rte)		0				
	Postmile (from-to)		0				
#	Direction (eb/wb/nb/sb)	Pm (From)	Pm (To)	Upward/level / downward?	% of profile grade	Level/rolling/ mountaineous	Remarks
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

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