

INFORMATION HANDOUT COVER sheet: Use for IH cover. Delete, replace, or add text to match the titles of the Information Handout contents. Use if supplemental project information includes an IH. Include cover if changes are made to IH due to addendum.

INFORMATION HANDOUT

INSERT: contract number ending in phase number 4. Road includes District–County–Route–Post Mile. Project ID phase number 1.

For Contract No. 12-0M3504

At 12-Ora-405-2.6/6.5

Identified by

Project ID 1212000018

MATERIALS REPORT

Final Materials Report for southbound interstate 405 (I-405) auxiliary lane construction from Culver Drive to University Drive in City of Irvine in Orange County, California.

GEOTECHNICAL REPORTS

1. Geotechnical design report for retaining wall No. 329
2. Geotechnical design report for OH sign structures (OS 1-2, 3-2, 7-2, 8-2, 11-1, 14-1, 14-3)

AERIALY DEPOSITED LEAD SITE INVESTIGATION REPORT

Interstate 405 from southbound Culver Drive Off-ramp to Jeffrey Road/University Drive Overcrossing, Irvine, Orange County, California

FOUNDATION REPORT

Geotechnical design report for retaining wall No. 335 (Bridge No. 55E0171)

Memorandum

*Serious drought.
Help Save Water!*

To: **MATTHEW Q. CUGINI, P.E.**
Branch Chief
Design Branch C

Date: May 12, 2016

File: 12-ORA-405
PM 2.6-6.5
EA 0M3501
ID 1212000018
Transmittal Letter for
Draft Materials Letter
Report

From: **MEHRDAD MAHDAVIAN, P.E.**
Transportation Engineer
Materials & Research Branch

Subject: **TRANSMITTAL OF FINAL MATERIALS REPORT FOR SOUTHBOUND INTERSTATE 405 (I-405) AUXILIARY LANE CONSTRUCTION FROM CULVER DRIVE TO UNIVERSITY DRIVE IN CITY OF IRVINE IN ORANGE COUNTY, CALIFORNIA.**

Attached please find the Final Materials Report that includes the summary for Life Cycle Cost Analysis for the above referenced project.

If you need additional information, please contact Mehrdad Mahdavian at X-4927.

Prepared by:

Concurred by:



Mehrdad Mahdavian, P.E.
Materials & Research Branch
Division of Project Delivery
RCE No. 47566



Behdad Baseghi, PhD, PE, GE, PMP
Chief, Materials & Research Branch
Division of Project Delivery
RCE No. 47051, GE No. 2310

Cc: Tam Nguyen
Fred Faizi
File

Memorandum

*Serious Drought.
Help Save Water!*

To: MATTHEW Q. CUGINI, P.E.
Branch Chief
Design Branch C

Date: May 12, 2016

From: MEHRDAD MAHDAVIAN, P.E.
Transportation Engineer
Materials & Research Branch

File: 12-ORA 405
PM 2.6-6.5
EA 0M3501
ID 1212000018

Subject: FINAL MATERIALS REPORT FOR SOUTHBOUND INTERSTATE 405 (I-405) AUXILIARY LANE CONSTRUCTION FROM CULVER DRIVE TO UNIVERSITY DRIVE IN CITY OF IRVINE IN ORANGE COUNTY, CALIFORNIA.

In accordance with your request, Materials and Research (M&R) Branch has prepared the Preliminary Materials Report for construction of an auxiliary lane extension on southbound I-405 Project from just north of Culver Drive Interchange to University Drive off-ramp. The project also proposes to widen and pave the median and replace the existing temporary railing (Type K) with concrete barrier along the centerline. The purpose of this report is to provide you with recommendations for pavement structural sections for the proposed improvements.

This report provides pavement design and materials recommendations in accordance with Topic 114 of Highway Design Manual (2015). There are other issues such as settlement/slope stability of ramp embankment fills, groundwater elevations, etc. that will be addressed by Roadway Geotechnical Design-South from HQ.

1.0 Introduction

I-405 is an Interstate freeway that extends from Irvine in Orange County to the Mission Hills District of Los Angeles County, linking to I-5 at both ends. The project proposes to replace existing temporary railing (Type K) with permanent Type 60/60C concrete barrier along the centerline of Route 405 within the project limits, and to extend No. 5 lane from SB Route 405 from Culver Drive off-ramp (henceforth known as SB Culver Drive off-ramp) to Jeffrey Road/University Drive off-ramp.

2.0 Existing Facility

The existing I-405 Freeway was constructed in the 1960-1969 and is a north-south route. The number of lanes varies from 8 to 14 mixed-flow lanes and 2 HOV lanes. In Orange County, Route 405 traverses diagonally about twenty-four miles through six cities of Irvine, Costa Mesa, Fountain Valley, Huntington Beach, Westminster and Seal Beach. It has 8 lanes from Route 5 to Route 133, 8 to 12 lanes from Route 133 to Route 39, 10 lanes from Route 39 to Route 22, and 8 to 14 lanes from Route 22 to Route 605. In July 1990, the High Occupancy Vehicle (HOV) lanes were added from Route 5 to Route 73. There are auxiliary lanes in selected portions along the

*"Provide a safe, sustainable, integrated and efficient transportation system
to enhance California's economy and livability"*

12-ORA-405
PM 2.6-6.5
Final Materials
Report
Page 1 of 10

route. Within the project limits, there is a cross-slope break along the HOV buffer in each direction due to the wide roadbed cross-section. An approximate 12,700 feet of temporary railing (Type K) and a 20-foot wide unpaved area in the median, between 1,500 feet north of Yale Avenue pedestrian overcrossing (POC) and 1,500 feet south of Sand Canyon Avenue OC, separate the northbound and southbound lanes of Route 405.

3.0 Proposed Project Improvement

The proposed project is composed of the following components:

1. Replacing the existing 12,700 feet of temporary railing (Type K) in the median with permanent Type 60/60C concrete barrier along the centerline of Route 405 within the project limits, and extending the S/B No. 5 lane.
2. Extending the S/B No. 5 lane on I-405 from Culver Drive off-ramp to Jeffrey Road/University Drive off-ramp.
3. Pave median area between stations 174+80 and 302+00.
4. Extend existing second auxiliary lane from SB Route 405 Culver Drive off-ramp to University Drive/Jeffrey Road OC.
5. Realign SB Culver Drive off and on-ramps to accommodate the lane extension.
6. Construct tieback wall and soil nail walls under Culver Drive overcrossing on SB Route 405.

4.0 Terrain and Surface Drainage

The project site is located in an industrial/residential area. The topography of the roadway alignment slopes down gently from south to north. Elevation of the mainline centerline within the project limit ranges from about 110 feet near University Drive Off-ramp to about 45 feet near Culver Drive Off-ramp.

5.0 Subsurface and Groundwater Conditions

The subsurface investigation that was conducted by Materials & Research (M&R) Branch is discussed in detail in Section 11. The purpose of this investigation was to obtain samples from the subgrade soils for laboratory testing. Details of laboratory testing are discussed in Section 12. Drilling was conducted in the shoulder areas where proposed widening is planned. Groundwater was not detected in any of our coring and we have no information regarding the groundwater elevations in this area. Roadway Geotechnical Design-South shall address the groundwater issues. It is required that groundwater levels be kept a minimum of 5 feet below the pavement structural section by providing an underdrain in areas of shallow groundwater.

6.0 Cut and Fill Construction

The proposed new widening for construction of No. 5 Lane extension and HOV lane, as well as ramp widening and reconstruction consists of minor cut and fill operation. ***All import fill material that is going to be placed within 4 feet of finished grade shall have an R-value of at least 40, a Plasticity Index (PI) of less than 12, and an Expansion Index of less than 50.*** It shall be non-corrosive to metals and concrete specially if any underground utilities or structures are planned to be constructed within the embankment.

7.0 Estimate of Settlement

Roadway Geotechnical Design-South under a separate report will address estimate of settlements for the roadway embankment fill and subsurface soils. ***All settlements have to be mitigated prior to the placement of the pavement structural section.***

8.0 Seismic Considerations

Roadway Geotechnical Design-South shall provide recommendations for seismic design including liquefaction/seismic settlement and lateral spreading (as applicable).

9.0 Earthwork

9.1 General Earthwork Requirements

All earthwork shall conform to requirements of Section 19 of Caltrans 2015 edition of Standard Specifications, and project Special Provisions. Very little borrow will be needed for construction of embankments. Majority of the earthwork will be excavation and reconstruction of the Culver Drive ramps. Source of imported borrow (if needed) is unknown at this time. Therefore, earthwork factors cannot yet be determined. If the Contractor is planning to use import borrow to replace the in-situ soils, they should provide pertinent information such as Classification, R-value, Gradation, SE, Compaction Curves, expansive, and corrosive properties to the District Materials Branch prior to their acceptance for use. ***This information needs to be verified on the jobsite.***

Compaction of soils shall be conducted in accordance with Section 19-5 of the Caltrans Standard Specifications. Fills placed against existing embankments shall be properly benched into the existing side slopes as described in Section 19-6.01 of the Caltrans Standard Specifications. Existing vegetation on slopes shall be removed and shall not be used as fill material. Any temporary sloping, sheeting and shoring shall be made the Contractor's responsibility. Appropriate measures shall be taken to prevent damage to adjacent structures and utilities. It should be noted

that it is the responsibility of the Contractor to oversee the safety of the workers in the field during construction. The Contractor shall conform to all applicable occupational safety and health standards, rules, regulations, and orders established by the State of California.

9.2 Construction Observation and Testing

It is recommended that inspection and testing be performed during the following stages of construction:

- Grading operations, including over excavation and placement of compacted fill;
- Removal of existing pavement structural sections, curbs and gutter;
- Preparation of pavement subgrade;
- Placement of aggregate base;
- Placement of Pavement sections;
- Excavations for utility trenches; and
- When any unusual conditions are encountered.

10.0 Traffic Index

District 12 Traffic Studies Branch has recommended a 40-year Traffic Index (TI) value of 15.5 on May 18, 2015 for the extension of Lane No. 5. A TI of 12 has been used for the HOV lane pavement design and a 40-year TI of 11 has been used for the design of Culver Drive ramps as recommended by HDM Table 613.5 A.

11.0 Summary of Field Investigation

Our field investigation was performed on June 8th and 10th of 2015. It consisted of conducting one core in the shoulder area of each ramp in addition to five cores in the right shoulder of SB I-405 and three cores in the left shoulder of I-405 HOV lane (See Coring MB-1 through MB-11 shown on Boring Location Layout Plans). At coring location MB-4 in the right shoulder of I-405 near the Culver Drive loop on-ramp drillers encountered a utility line and the location was abandoned. A new location two feet toward the outside shoulder was cored and sampled. At each location, the surface HMA pavement was cored in order to obtain representative samples from the subsurface soils. Bulk soil samples collected from the subsurface soils were sent to Southern Regional Laboratory (SRL) for testing. Table 3 presents summary of Laboratory Test Results for these samples. Coring of pavement section and base layer was conducted at each location, followed by drilling of subbase and subgrade soils. The purpose of this investigation was to measure the thickness of each layer, as well as obtaining representative samples of subsurface soils for laboratory testing. The existing ramp or the freeway mainline could not be drilled due to difficulty in traffic control. Table 1 presents summary of boring location and sampling data. Table 2 presents summary of pavement section data as found during coring compared with the pavement sections presented in the as-built plans.

12.0 Laboratory Testing

The following laboratory tests were performed on each sample collected from the boring:

- Sieve Analysis (CTM 202)
- Mechanical Analysis (CTM 203)
- Atterberg Limits (CTM 204)
- Sand Equivalent (CTM 217)
- R-Value (CTM 301)
- Expansion Index (UBC 29.2)
- Resistivity and pH (CTM 643)
- Sulfate Content (CTM 417)*
- Chloride Content (CTM 422)*

Table 3 presents summary of laboratory test results for each sample and its location (ramp).

*Note: Samples with Resistivity less than 1000 Ω -cm were tested for Sulfate and Chloride.

12.1 Corrosion Testing

Caltrans Bridge Memo to Designers 3-1 (Caltrans, 2000), defines a corrosive environment as one where the soil has electrical resistivity of less than 1000 Ω -cm, sulfate content of greater than 2,000 ppm, chloride content of greater than 500 ppm, or pH of less than 5.5. Soil samples obtained from Borings MB-1 through MB-11 were sent SRL for pH and resistivity testing. Samples having resistivity less than 1000 ohm-cm were then sent to Headquarters for chloride and sulfate content testing in accordance with CTM 422 and CTM 417 respectively. Results of laboratory corrosion testing are presented in Table3.

As shown on Table 3 only one of the eleven samples tested for corrosion had electrical resistivity less than 1000 Ω -cm. One sample (MB-2) was taken from Southbound Culver Drive Loop On-ramp to Southbound I-405. The pH of sample MB-1 was 8.83, and electrical resistivity was 860 Ω -cm. Chloride content of the sample is 31 ppm and Sulfate content of it is 211 ppm, therefore the soil at this location is not considered corrosive to metals and concrete.

13.0 Findings, Conclusions and Recommendations

Our field investigation revealed that the existing pavement is different from what is shown on the As-Built plans provided to us. Table 2 presents a summary of existing pavement as depicted in our coring operation versus the As-Built data. The main area of difference exists in the thickness of top layer of Rubberized Hot Mixed Asphalt, which could have been placed by maintenance division at a later date to preserve the existing pavement.

Based on a 40-year TI value of 15.5 for the mainline, 11 for the ramps and 12 for the HOV lane, the following pavement sections are recommended:

- **Southbound I-405 Auxiliary Lane (14' Widened Slab)** ($TI_{40}=15.5, 10 <R<40$)
0.85' CRCP over 0.25' HMA-Type A over 0.7' Class 2 AS *or*
0.9' JPCP over 0.35' LCB over 0.7' Class 2 AS
- **S I-405 Auxiliary Lane and Median Shoulder and MVP** ($TI_{20}=9, 10 <R<40$)
0.2' RHMA-G over 0.25' HMA-Type A over 1.0' Class 2 AB over 0.65' Class 2 AS
- **Median HOV Lane** ($TI_{40}=12, 10 <R<40$)
0.8' CRCP over 0.25' HMA-Type A over 0.6' Class 2 AS *or*
0.85' JPCP over 0.35' LCB over 0.6' Class 2 AS
- **Culver Drive On and Off ramps and shoulders** ($TI_{40}=11, 10 <R<40$)
0.2' RHMA-G over 1.2' HMA-Type A with SAMI Interlayer over 0.5' Class 2 AB over
2.1' Class 2 AS

We also recommend that **same structural section as the ramp be used for the ramps shoulder area in order to compensate for truck off-tracking on the shoulder area (See Section 607.4-2 of HDM)**. If shoulders are being used for temporary detours or permanent traffic lanes, the *shoulder structural section has to be redesigned for the expected traffic prior to its intended usage*.

13.0 Life Cycle Cost Analysis

A Life Cycle Cost Analysis (LCCA) was performed for different pavement alternatives for this project. It analyzed the pavement sections recommended above to evaluate the cost effectiveness of each alternative. LCCA will not be performed for the ramps since Culver Drive Off-ramp widening is partial and on-ramps are not required to be analyzed by LCCA manual. A 40-year HMA design is recommended for all the ramps. Result of LCCA for the mainline auxiliary lane and HOV lane are presented as an appendix to this report.

14.0 Materials Available

Imported borrow will be required for construction of embankments and replacement of unsuitable soils within the project limits. Local sources of construction materials were not investigated in this study. However, materials are available from several commercial suppliers throughout Orange, Los Angeles, Riverside and San Bernardino Counties. Furthermore, the Web-Site of Department of Conservation on the Internet contains a current listing of mining operations eligible to sell materials to the State of California. The page can be accessed at: <http://www.conservation.ca.gov/omr>

15.0 Limitations

This report is intended for the use of Caltrans for the proposed extension of Lane No. 5 and median paving on S/B I-405 in City of Irvine, California. This report is based on the project as described and the information obtained from the exploratory borings at the approximate locations indicated on the attached plans. The findings and recommendations contained in this report are based on the results of the field investigation, laboratory tests, and engineering analyses. In addition, soils and subsurface conditions encountered in the exploratory borings are presumed to be representative of the project site. However, subsurface conditions and characteristics of soils between exploratory borings can vary. The findings reflect an interpretation of the direct evidence obtained. The recommendations presented in this report are based on the assumption that an appropriate level of quality control and quality assurance (inspections and tests) will be provided during construction. District Materials and Research Branch should be notified of any pertinent changes in the project plans or if subsurface conditions are found to vary from those described herein. Such changes or variations may require a re-evaluation of the recommendations contained in this report.

The data, opinions, and recommendations contained in this report are applicable to the specific design element(s) and location(s), which is (are) the subject of this report. They have no applicability to any other design elements or to any other locations and all subsequent users accept all liability resulting from any use or reuse of the data, opinions, and recommendations without the prior written consent of the District Materials and Research Branch.

This report is prepared in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. No other representation, expressed or implied, and no warranty or guarantee is included or intended.

16.0 Recommended Materials Specifications

The following requirements shall be included in the project specifications:

- If the Contractor is planning to use import borrow to replace the in-situ soils, they should provide pertinent information such as Classification, R-value, Gradation, SE, Compaction Curves, expansive, and corrosive properties to the District Materials Branch prior to their acceptance for use. This information **needs to be verified on the jobsite.**
- Prior to the placement of pavement widening section on native soils, the native soils within upper 4 feet to the finished grade shall be tested and verified to have a minimum R-value as required in Table 3, be non-corrosive to metal and concrete and have an expansive index (EI) of less than 21 or plasticity index of less than 12. If the existing native soils within upper 4 feet to the finished grade is determined to be not meeting the above requirements, the existing native soils shall be over-excavated and replaced with imported borrow to meet the imported fill recommendations herein. Borrow materials shall conform to Section 19-7.02 of Caltrans Standard Specifications (2015).
- For pavement widening section on imported fill areas, the engineering fill within the upper 4 feet to the finished grade shall have an R-value of at least 40, be non-corrosive to metal and concrete and have an expansive index (EI) of less than 21 or plasticity index (PI) of less than 12. Non-corrosive requirements shall be based on Caltrans Corrosion Guidelines.
- Prior to the placement of pavement sections, the subgrade soils shall be compacted in accordance with Section 19-5.03 of Caltrans Standard Specification (2015).
- Saw cut and remove the existing shoulder's HMA pavement. The HMA pavement shall be saw cut to full depth.
- Hot Mix Asphalt (HMA) shall be Type A, Aggregate Base (AB) and Aggregate Subbase (AS) shall be Class 2. Extreme care must be taken to ensure moisture sensitive aggregates are not used for AC mix design.
- Same structural section as the ramp shall be used for the shoulder area in order to compensate for truck off tracking on the shoulder area.
- It is imperative that special attention is given to the mix design, compaction and temperature requirements for flexible pavement as stated in Caltrans Standard Specifications and Project Standard Special Provisions (SSPs).
- Tack coat applications and requirements shall follow Sections 39-2.01C(3)(f) of the Caltrans Standard Specifications.

- Tack coat shall be applied to all vertical faces of existing pavement, curbs, gutters and construction joints in the surfacing against which additional material is to be placed, to a pavement to be surfaced and to other surfaces designated in the Special Provisions.
- Special attention is required to be given to the following sections of 2015 Standard Specifications:
 - Section 19: Earthwork;
 - Section 25: Aggregate Subbases;
 - Section 28: Lean Concrete Base;
 - Section 39: Hot Mix Asphalt;
 - Section 40: Concrete Pavement;
 - Section 61: Division VII Drainage Facilities;
 - Section 64: Plastic Pipe;
 - Section 65: Reinforced Concrete Pipe;
 - Section 66: Corrugated Metal Pipe;
 - Section 68: Subsurface Drains;
 - Section 90: Portland Cement Concrete;
 - Section 92: Asphalts Binders;
 - Section 94: Asphaltic Emulsion.
- All Standard Special Provisions (SSPs) to be included in the project shall be submitted to the Materials and Research Branch for review and approval.

If you have any questions, please call Mehrdad Mahdavian at (949) 756-4927.

Prepared by:



Mehrdad Mahdavian, PE
Materials & Research Branch
Division of Design
RCE # 47566

Concurred by:



Behdad Baseghi, PhD, PE, GE, PMP
Chief, Materials & Research Branch
Division of Design
RCE # 47051

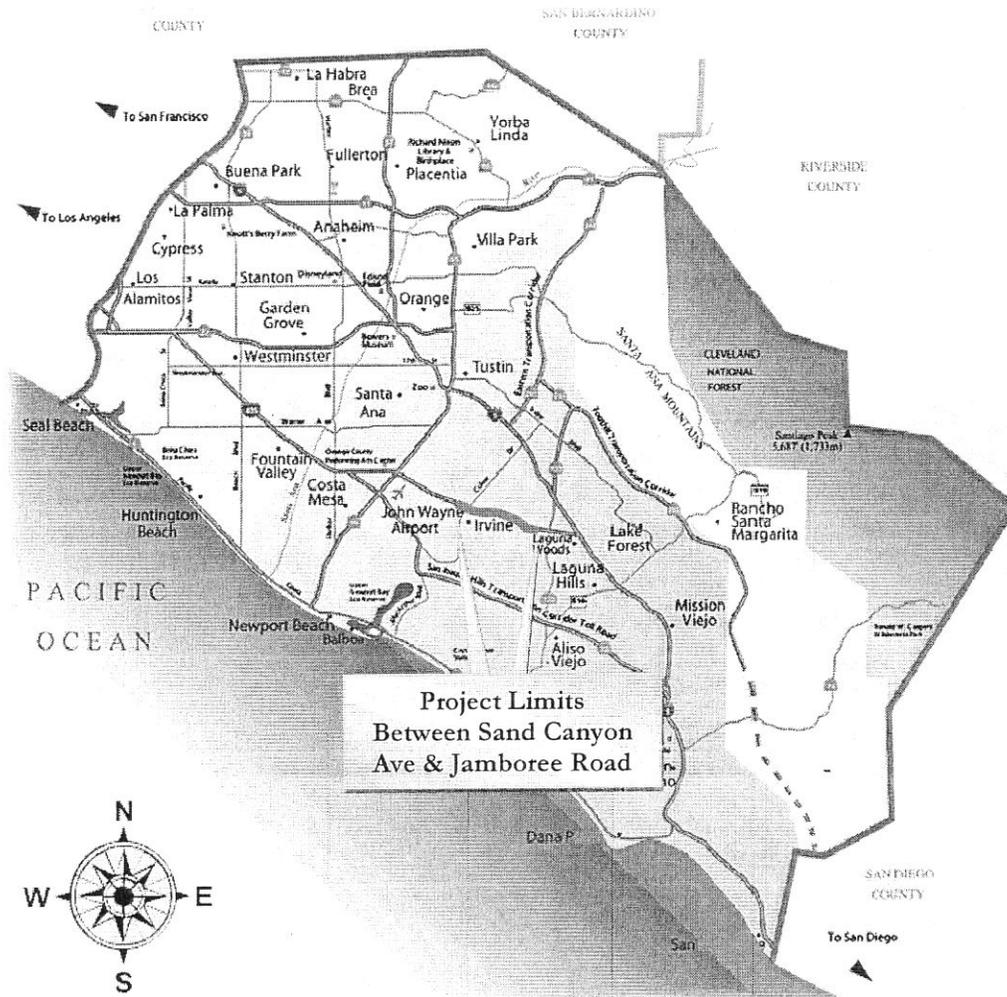
Attachments: Figure 1: Site Location Map
Boring Location Layout Plans
Tables 1 through 3
Laboratory Results
Corrosion Analysis Results
Copy of Traffic Index Letter
Copies of As-Built Plans
Copy of Life Cycle Cost Analysis Summary



Cc: Tam Nguyen, Fred Faizi, File

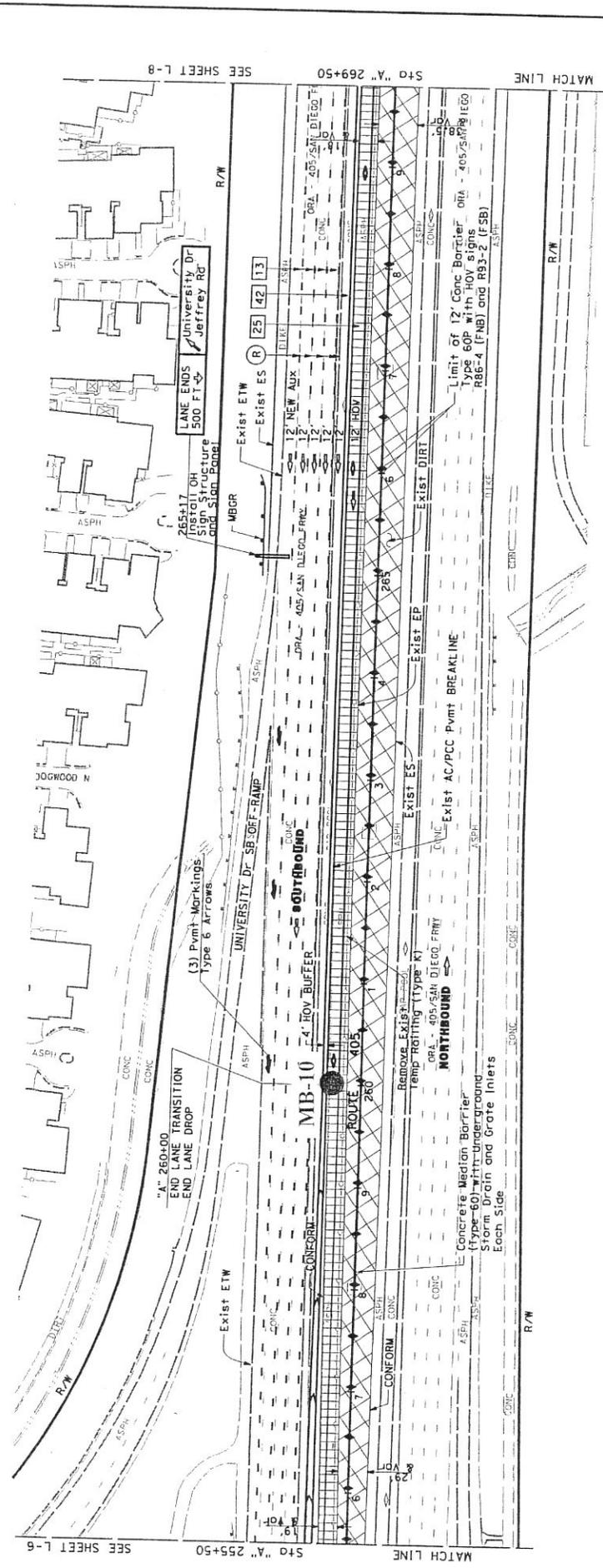
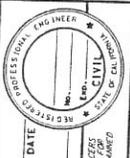
FIGURES

Figure 1: Site Location Map



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	DESIGN	MATTHEW G. CUCINI	FUNCTIONAL SUPERVISOR	DATE REVISION	DATE REVISION
		FRED FAIZI	DESIGNED BY	REVISION	REVISION
			CHECKED BY		

DIST	COUNTY	ROUTE	MILES	SHEET	TOTAL
12	070	405	2.6765		
REGISTERED CIVIL ENGINEER		DATE	PLANS APPROVAL DATE		
			THE STATE OF CALIFORNIA DOES NOT WARRANT OR AGENTS SHALL NOT BE RESPONSIBLE FOR COPIES OF THIS PLAN SHEET.		



Boring Location Layout Plan
SCALE: 1" = 50'

DATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	DESIGN	MATTHEW G. CUGINI	FUNCTIONAL SUPERVISOR
		FRED FAIZI	CALCULATED BY
			REVISOR
			DATE REVISED

DIST.	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS
12	ORC	405	2.6/6.5	

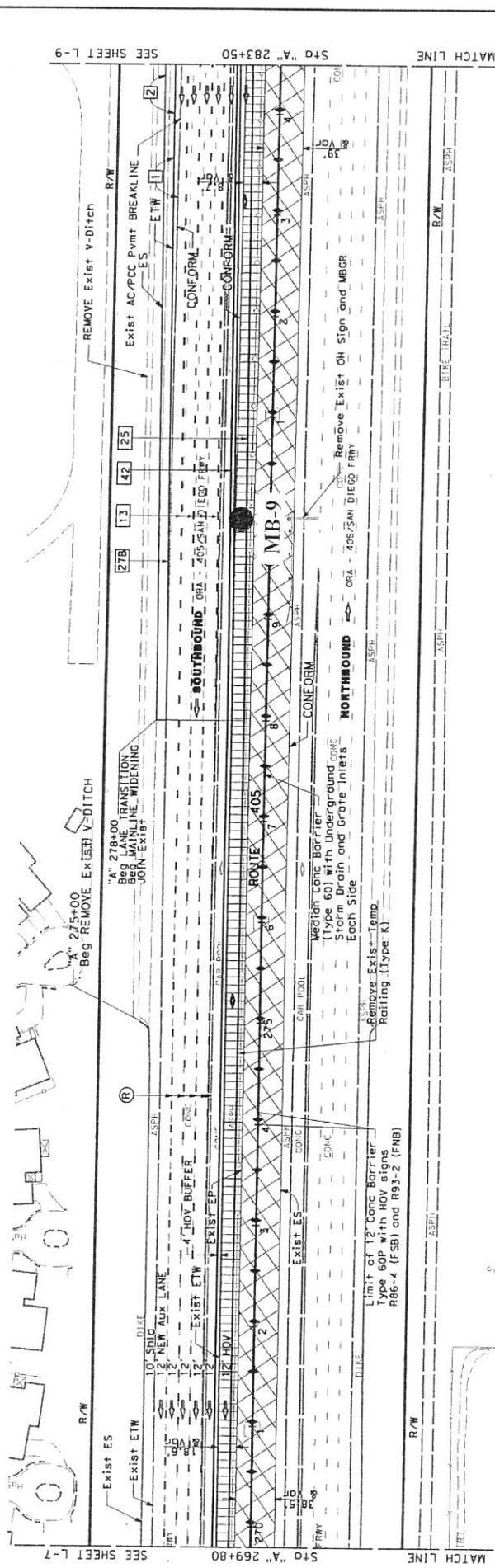
REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

REGISTERED CIVIL ENGINEER DATE

REGISTERED CIVIL ENGINEER

REGISTERED CIVIL ENGINEER



SEE SHEET L-7

Sta "A" 269+80

MATCH LINE

SEE SHEET L-9

Sta "A" 283+50

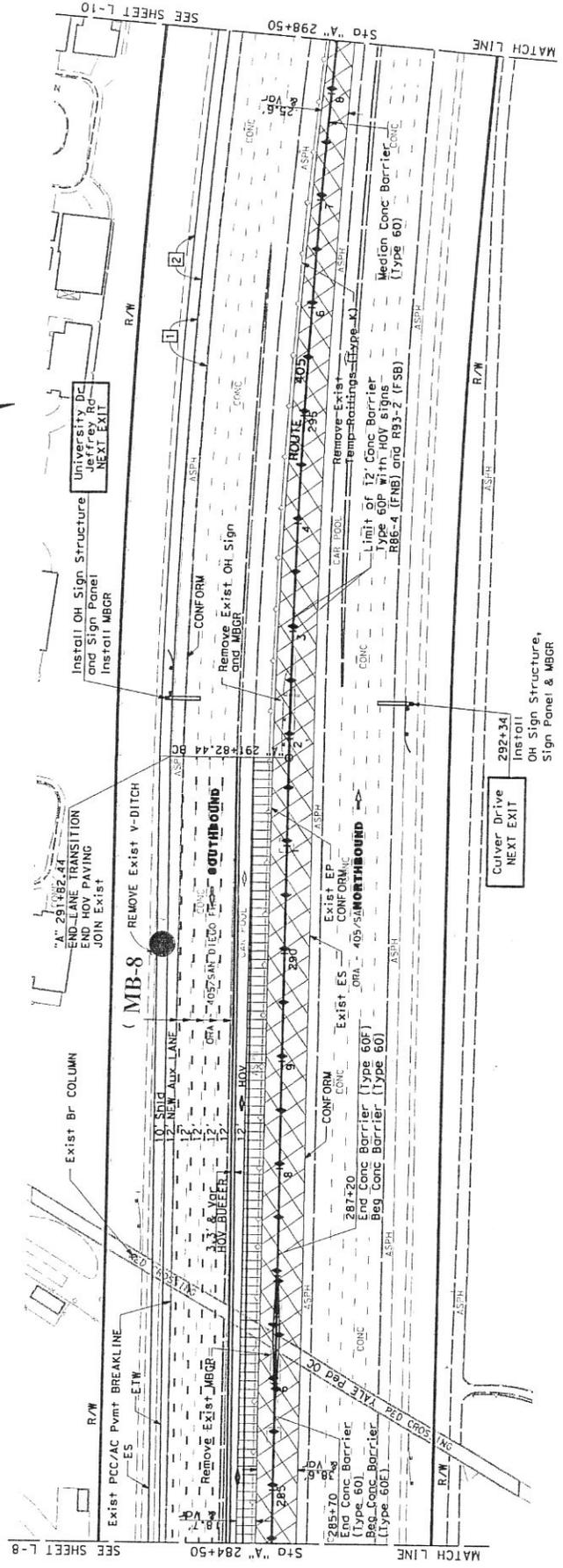
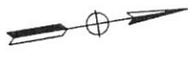
MATCH LINE

Boring Location Layout Plan
SCALE: 1" = 50'

L-8

DATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	MATTHEW O. CUCINI	CHECKED BY	FRED FAIZI	DATE REVISED	
DESIGN	DESIGNED BY		REVISD BY			

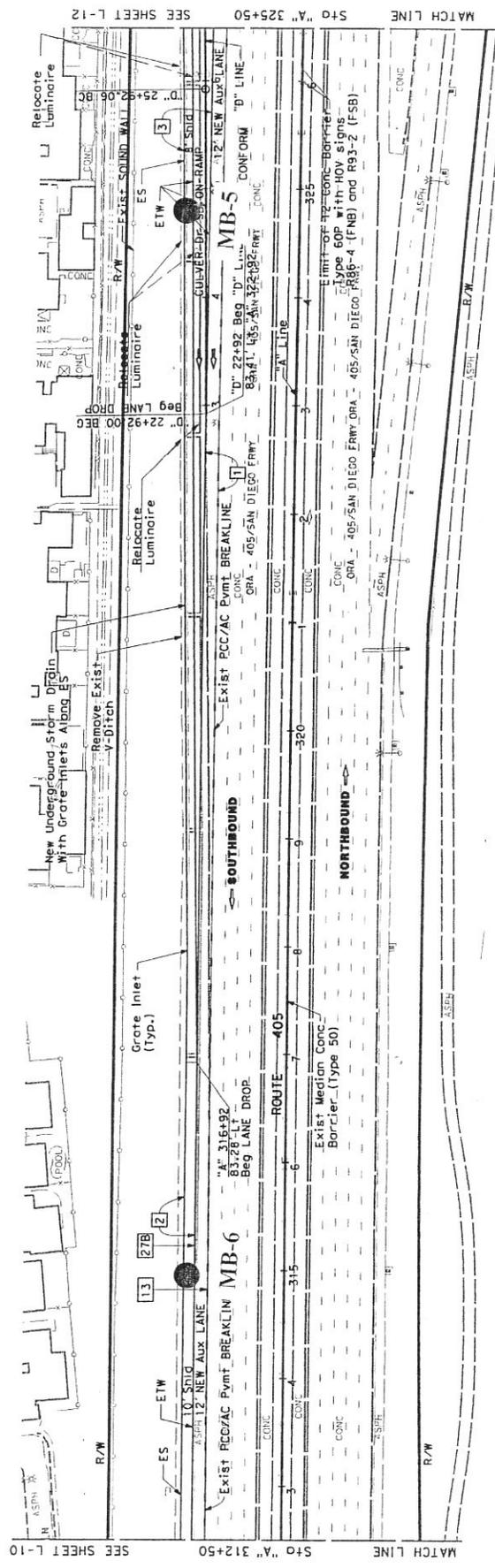
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL
12	Or	405	2.676.5	NO. SHEETS
REGISTERED CIVIL ENGINEER DATE				
PLANS APPROVAL DATE				
I AM APPROVING THESE PLANS FOR THE PROJECT AND AGREE TO HOLD MYSELF AND MY FIRM RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION CONTAINED HEREON.				



SEE SHEET L-8

SEE SHEET L-10

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	MATTHEW O. CUGINI	CHECKED BY	DATE REVISIED
DESIGN	DESIGNED BY	FRED FAIZI	REVISIED BY	



DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS
12	OTO	405	2.6/6.5	

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICER OR AGENT SHALL NOT BE RESPONSIBLE FOR COPIES OF THIS PLAN SHEET.



Boring Location Layout Plan
 SCALE: 1" = 50'
 L-11

TABLES

TABLE 1- SUMMARY OF BORING AND SAMPLING DATA

Route No.	Boring No.	Boring Location	PM	Station	Offset (ft)	Sample No.	Depth (ft)	Sample Type	USCS Soil Type	EXISTING Pavement Thickness (ft)	Sampled by	Sampling Date	Date Sent to Lab	Date Received Results
405	MB-1	SB Off-ramp to Culver Drive	5.78	346+00	138L	MB-1	3-5	bulk	SC	0.1 RHMA / 0.35 HMA / AB	MM	6/8/2015	6/10/2015	6/29/2015
	MB-2	SB On-ramp from SB Culver Drive	5.66	349+60	116L	MB-2	3-5	bulk	CL	0.4 HMA / 0.2 CTB / Existing Soil	MM	6/8/2015	6/10/2015	6/30/2015
	MB-3	SB On-ramp from NB Culver Drive	5.53	332+60	150L	MB-3	3-5	bulk	CL	0.3 HMA / Existing Clayey Soil	MM	6/8/2015	6/10/2015	6/30/2015
	MB-4	Right Shoulder of SB I-405	5.71	342+00	100L	MB-4	3-5	bulk	CL	0.1 RHMA / 0.35 HMA / AB	MM	6/8/2015	6/10/2015	6/30/2015
	MB-5	Right Shoulder of SB I-405	5.38	325+00	95L	MB-5	3-5	bulk	SM	0.1 OGFC / 0.4 HMA / AS	MM	6/8/2015	6/10/2015	7/7/2015
	MB-6	Right Shoulder of SB I-405	5.19	315+00	85L	MB-6	3-5	bulk	SM	0.2 RHMA / 0.2 HMA / AS	MM	6/8/2015	6/10/2015	7/7/2015
	MB-7	Right Shoulder of SB I-405	4.91	300+00	95L	MB-7	3-5	bulk	SC	0.2 RHMA / 0.2 HMA / AS	MM	6/8/2015	6/10/2015	7/7/2015
	MB-8	Right Shoulder of SB I-405	4.72	290+00	100L	MB-8	3-5	bulk	SM	0.2 RHMA / 0.2 HMA / AS	MM	6/8/2015	6/10/2015	7/7/2015
	MB-9	Left Shoulder of SB I-405	4.53	280+00	20L	MB-9	3-5	bulk	SC	0.15 RHMA / 0.3 HMA / AS	MM	6/10/2015	6/10/2015	7/7/2015
	MB-10	Left Shoulder of SB I-405	4.16	260+00	20L	MB-10	3-5	bulk	SM	0.2 RHMA / AS	MM	6/10/2015	6/10/2015	7/7/2015
	MB-11	Left Shoulder of SB I-405	3.97	250+00	10L	MB-11	3-5	bulk	SM	0.2 RHMA / 0.25 HMA / AS	MM	6/10/2015	6/10/2015	7/7/2015

TABLE 2-SUMMARY OF CORING VS AS-BUILT DATA

Route No.	Direction	Coring Location	Coring No.	Station	Offset (ft)	Existing Pavement (ft)			As-Built Pavement (ft)			Recommended Pavement Section (ft) for: Culver Drive Ramps, Shoulder and MVP
						RHMA	HMA	AB/AS	RHMA	HMA	AB/AS	
405	SB	Right Shoulder of SB Off-ramp to Culver Drive	MB-1	346+00	138L	0.1	0.35	1.65	0	0.35	1.65	0.2' RHMA-G over 1.2' HMA-Type A with SAMI Interlayer over 0.5' Class 2 AB over 2.1' Class 2 AS
		MVP Area of SB On-ramp from SB Culver Drive	MB-2	349+60	116L	0	0.4	0.2 CTB	N/A	N/A	N/A	
		MVP Area of SB On-ramp from NB Culver Drive	MB-3	332+60	150L	0	0.3	1.65	N/A	N/A	N/A	
		Right Shoulder of SB I-405	MB-4	342+00	100L	0.1	0.35	1.65	0	0.35	1.65	
		Right Shoulder of SB I-405	MB-5	325+00	95L	0.2	0.2	1.65	0	0.35	1.65	
		Right Shoulder of SB I-405	MB-6	315+00	85L	0.2	0.2	1.65	0	0.35	1.65	
		Right Shoulder of SB I-405	MB-7	300+00	95L	0.2	0.2	1.65	0	0.35	1.65	
		Right Shoulder of SB I-405	MB-8	290+00	100L	0.2	0.2	1.65	0	0.35	1.65	
		Left Shoulder of SB I-405	MB-9	280+00	20L	0.2	0.3	1.65	0	0.35	1.65	
		Left Shoulder of SB I-405	MB-10	260+00	20L	0.2	0.25	1.65	0	0.35	1.65	
		Left Shoulder of SB I-405	MB-11	250+00	10L	0.2	0.25	1.65	0	0.35	1.65	

Notes:

- 1 Coring Data was obtained from core samples taken on June 8, 2015
- 2 MVP, Gore Area and Shoulder Structural Section will be the same.
- 3 Acronyms:

- HMA** Hot Mix Asphalt Concrete Asphalt Concrete-Type A- 3/4" (See Std. Spec. Section 3)
- RHMA-G** Rubberized Hot Mix Asphalt -Gap Graded
- CRCP** Continuously Reinforced Concrete Pavement
- SAMI** Stress Absorbing Membrane Interlayer
- AB** Class 2 Aggregate Base (See Std. Spec. Section 26-1.02A)
- AS** Class 2 Aggregate Subbase (See Std. Spec. Section 25)
- R** R-Value (Caltrans Test Method 301)
- AB/AS** Combined Thickness of Base and Subbase (Measured)
- N/A** Not Available or Not Applicable

TABLE 3-SUMMARY OF LABORATORY TEST RESULTS

Route No.	Boring No.	Sample No.	Sample Depth (ft)	Percent Passing No. 200 Sieve	SE (%)	USCS	Expansion Index	Atterberg Limits (%)			R-Value	SOIL pH	Corrosivity		Resistivity (Ohm-cm)
								LL	PL	PI			Sulfate Content (ppm)	Chloride Content (ppm)	
405	MB-1	MB-1	3-5	39	13	SM	23	25	18	7	15	8.8	NA	NA	1068
	MB-2	MB-2	3-5	48	8	SM-CL	80	19	17	19	5	8.83	211	31	860
	MB-3	MB-3	3-5	47	8	SM-CL	59	32	15	17	4	9.03	NA	NA	1058
	MB-4	MB-4	3-5	52	9	ML-CL	31	30	15	15	9	8.66	NA	NA	1363
	MB-5	MB-5	3-5	20	21	SM	1	25	17	8	16	8.46	NA	NA	2854
	MB-6	MB-6	3-5	32	15	SM	8	22	18	4	15	8.73	NA	NA	3075
	MB-7	MB-7	3-5	27	17	SM	7	20	17	3	12	8.86	NA	NA	2602
	MB-8	MB-8	3-5	21	21	SM	0	NP	NP	NP	58	8.26	NA	NA	4325
	MB-9	MB-9	3-5	36	7	SM	25	27	17	10	31	8.73	NA	NA	1751
	MB-10	MB-10	3-5	23	16	SM	0	NP	NP	NP	39	8.41	NA	NA	2997
	MB-11	MB-11	3-5	24	16	SM	0	NP	NP	NP	71	8.54	NA	NA	3492

Notes: 1) NA Not Applicable since Resistivity was greater than 1000 ohm-cm.

LAB RESULTS

SRL SOIL & AGGREGATE TESTS

Sample of: Subsurface Soils from Boring MB-1		SRL Lab. Stamp																																																																																																																																													
Sampled from: 0-5' below the surface		By _____ for _____																																																																																																																																													
Material Source: Rt Shld of SB 1-405 off ramp to Culver		D. OZOWARA																																																																																																																																													
Owner / Mfr.: Caltrans		SRL Materials Engineer																																																																																																																																													
Date Sampled: 6/8/15		SOUTHERN REGIONAL LABORATORY																																																																																																																																													
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">GRADING ANALYSIS</th> </tr> <tr> <td>Total Wt.</td> <td>10783 g</td> <td>By:</td> <td>Date:</td> </tr> <tr> <td>Wt. Ret.</td> <td>Size (mm)</td> <td>Acc. Wt. Ret. % Ret. % Pass</td> <td>Comb. % Pass</td> </tr> <tr> <td></td> <td>87.5</td> <td></td> <td></td> </tr> <tr> <td></td> <td>75</td> <td></td> <td></td> </tr> <tr> <td></td> <td>62.5</td> <td></td> <td></td> </tr> <tr> <td></td> <td>50</td> <td></td> <td></td> </tr> <tr> <td></td> <td>37.5</td> <td></td> <td></td> </tr> <tr> <td></td> <td>25</td> <td>0</td> <td>100</td> </tr> <tr> <td></td> <td>19</td> <td>49</td> <td>0</td> </tr> <tr> <td></td> <td>12.5</td> <td>170</td> <td>2</td> </tr> <tr> <td></td> <td>9.5</td> <td>269</td> <td>2</td> </tr> <tr> <td></td> <td>4.75</td> <td>497</td> <td>5</td> </tr> <tr> <td></td> <td>10286</td> <td>10783</td> <td></td> </tr> </table>		GRADING ANALYSIS				Total Wt.	10783 g	By:	Date:	Wt. Ret.	Size (mm)	Acc. Wt. Ret. % Ret. % Pass	Comb. % Pass		87.5				75				62.5				50				37.5				25	0	100		19	49	0		12.5	170	2		9.5	269	2		4.75	497	5		10286	10783		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td colspan="2">R.E.: Mehرداد Mahdavian</td> </tr> <tr> <td colspan="2">Address: Caltrans-Dist. 12</td> </tr> <tr> <td colspan="2">Phone No.: (949) 756-4927</td> </tr> <tr> <td colspan="2">Fax No.: (949) 724-2519</td> </tr> </table>		R.E.: Mehرداد Mahdavian		Address: Caltrans-Dist. 12		Phone No.: (949) 756-4927		Fax No.: (949) 724-2519																																																																													
GRADING ANALYSIS																																																																																																																																															
Total Wt.	10783 g	By:	Date:																																																																																																																																												
Wt. Ret.	Size (mm)	Acc. Wt. Ret. % Ret. % Pass	Comb. % Pass																																																																																																																																												
	87.5																																																																																																																																														
	75																																																																																																																																														
	62.5																																																																																																																																														
	50																																																																																																																																														
	37.5																																																																																																																																														
	25	0	100																																																																																																																																												
	19	49	0																																																																																																																																												
	12.5	170	2																																																																																																																																												
	9.5	269	2																																																																																																																																												
	4.75	497	5																																																																																																																																												
	10286	10783																																																																																																																																													
R.E.: Mehرداد Mahdavian																																																																																																																																															
Address: Caltrans-Dist. 12																																																																																																																																															
Phone No.: (949) 756-4927																																																																																																																																															
Fax No.: (949) 724-2519																																																																																																																																															
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">R-VALUE BATCH</th> <th colspan="2">% CRUSHED PARTICLES</th> <th colspan="2">SPEC.</th> </tr> <tr> <td>% Run</td> <td>Size</td> <td>Wt.</td> <td>% Ret. x (Wt. Cr. / Tot. Wt.) = Prod.</td> <td>Wtd.</td> <td></td> </tr> <tr> <td>100</td> <td>19 mm</td> <td>1200</td> <td></td> <td>Avg.</td> <td></td> </tr> <tr> <td>98</td> <td>12.5 mm</td> <td>1176</td> <td></td> <td>% CP</td> <td></td> </tr> <tr> <td>98</td> <td>9.5 mm</td> <td>1176</td> <td></td> <td>Ret.</td> <td></td> </tr> <tr> <td>95</td> <td>4.75 mm</td> <td>1140</td> <td></td> <td>No. 4 =</td> <td></td> </tr> </table>		R-VALUE BATCH		% CRUSHED PARTICLES		SPEC.		% Run	Size	Wt.	% Ret. x (Wt. Cr. / Tot. Wt.) = Prod.	Wtd.		100	19 mm	1200		Avg.		98	12.5 mm	1176		% CP		98	9.5 mm	1176		Ret.		95	4.75 mm	1140		No. 4 =		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">R-VALUE</th> <th colspan="2">MOISTURE</th> <th colspan="2">PLASTICITY</th> </tr> <tr> <td>RESULT</td> <td>15</td> <td>CONTENT</td> <td>SPEC.</td> <td>INDEX</td> <td>25</td> </tr> <tr> <td>SP. G. FINE (SSD)</td> <td></td> <td>Gr. Wet</td> <td></td> <td>L.L.</td> <td></td> </tr> <tr> <td>(B) S.S. Dry</td> <td></td> <td>Gr. Dry</td> <td></td> <td>P.L.</td> <td>18</td> </tr> <tr> <td>(A) Ov. Dry</td> <td></td> <td>H2O</td> <td></td> <td>P.I.</td> <td>7</td> </tr> <tr> <td>ABS. %</td> <td></td> <td>Tare</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Wt. S+C+H2O</td> <td></td> <td>Net Dry</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Wt. S+C</td> <td></td> <td>% H2O</td> <td></td> <td></td> <td></td> </tr> </table>		R-VALUE		MOISTURE		PLASTICITY		RESULT	15	CONTENT	SPEC.	INDEX	25	SP. G. FINE (SSD)		Gr. Wet		L.L.		(B) S.S. Dry		Gr. Dry		P.L.	18	(A) Ov. Dry		H2O		P.I.	7	ABS. %		Tare				Wt. S+C+H2O		Net Dry				Wt. S+C		% H2O																																																											
R-VALUE BATCH		% CRUSHED PARTICLES		SPEC.																																																																																																																																											
% Run	Size	Wt.	% Ret. x (Wt. Cr. / Tot. Wt.) = Prod.	Wtd.																																																																																																																																											
100	19 mm	1200		Avg.																																																																																																																																											
98	12.5 mm	1176		% CP																																																																																																																																											
98	9.5 mm	1176		Ret.																																																																																																																																											
95	4.75 mm	1140		No. 4 =																																																																																																																																											
R-VALUE		MOISTURE		PLASTICITY																																																																																																																																											
RESULT	15	CONTENT	SPEC.	INDEX	25																																																																																																																																										
SP. G. FINE (SSD)		Gr. Wet		L.L.																																																																																																																																											
(B) S.S. Dry		Gr. Dry		P.L.	18																																																																																																																																										
(A) Ov. Dry		H2O		P.I.	7																																																																																																																																										
ABS. %		Tare																																																																																																																																													
Wt. S+C+H2O		Net Dry																																																																																																																																													
Wt. S+C		% H2O																																																																																																																																													
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">FINE GRADE / MECHANICAL ANALYSIS</th> <th colspan="2">MIN. SPEC.</th> </tr> <tr> <td>Dry Wt. (g)</td> <td>2.36 mm</td> <td>0</td> <td>100</td> </tr> <tr> <td></td> <td>1.18 mm</td> <td>4</td> <td>96</td> </tr> <tr> <td></td> <td>600 µm</td> <td>9</td> <td>91</td> </tr> <tr> <td></td> <td>300 µm</td> <td>18</td> <td>82</td> </tr> <tr> <td></td> <td>150 µm</td> <td>31</td> <td>69</td> </tr> <tr> <td></td> <td>75 µm</td> <td>48</td> <td>52</td> </tr> <tr> <td></td> <td></td> <td>59</td> <td>41</td> </tr> <tr> <td></td> <td></td> <td></td> <td>39</td> </tr> </table>		FINE GRADE / MECHANICAL ANALYSIS		MIN. SPEC.		Dry Wt. (g)	2.36 mm	0	100		1.18 mm	4	96		600 µm	9	91		300 µm	18	82		150 µm	31	69		75 µm	48	52			59	41				39	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">MECH. / HYDRO.</th> <th colspan="2">pH / RESISTIVITY</th> </tr> <tr> <td>lhr.</td> <td>5M</td> <td>Field</td> <td>Lab.</td> </tr> <tr> <td>24hr.</td> <td>1M</td> <td>Soil pH</td> <td>8.80</td> </tr> <tr> <td></td> <td></td> <td>H2O</td> <td>5.70</td> </tr> <tr> <td></td> <td></td> <td>Min. Resistivity</td> <td>1068</td> </tr> <tr> <td></td> <td></td> <td colspan="2">Based on 18 gauge CMP.</td> </tr> <tr> <td></td> <td></td> <td colspan="2">Estimated life: 26 yrs.</td> </tr> </table>		MECH. / HYDRO.		pH / RESISTIVITY		lhr.	5M	Field	Lab.	24hr.	1M	Soil pH	8.80			H2O	5.70			Min. Resistivity	1068			Based on 18 gauge CMP.				Estimated life: 26 yrs.																																																																													
FINE GRADE / MECHANICAL ANALYSIS		MIN. SPEC.																																																																																																																																													
Dry Wt. (g)	2.36 mm	0	100																																																																																																																																												
	1.18 mm	4	96																																																																																																																																												
	600 µm	9	91																																																																																																																																												
	300 µm	18	82																																																																																																																																												
	150 µm	31	69																																																																																																																																												
	75 µm	48	52																																																																																																																																												
		59	41																																																																																																																																												
			39																																																																																																																																												
MECH. / HYDRO.		pH / RESISTIVITY																																																																																																																																													
lhr.	5M	Field	Lab.																																																																																																																																												
24hr.	1M	Soil pH	8.80																																																																																																																																												
		H2O	5.70																																																																																																																																												
		Min. Resistivity	1068																																																																																																																																												
		Based on 18 gauge CMP.																																																																																																																																													
		Estimated life: 26 yrs.																																																																																																																																													
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">SAND EQUIVALENT</th> <th colspan="2">MIN. SPEC.</th> </tr> <tr> <td>Sand R2</td> <td>1.6</td> <td>1.7</td> <td>Avg.</td> </tr> <tr> <td>Clay R1</td> <td>12.9</td> <td>13.6</td> <td></td> </tr> <tr> <td>S.E. Value</td> <td>13</td> <td>13</td> <td>13</td> </tr> </table>		SAND EQUIVALENT		MIN. SPEC.		Sand R2	1.6	1.7	Avg.	Clay R1	12.9	13.6		S.E. Value	13	13	13	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">L.A.R.T.</th> <th colspan="2">% SPEC.</th> </tr> <tr> <td>A</td> <td>100</td> <td>5000g</td> <td>% Loss</td> </tr> <tr> <td>B</td> <td>100</td> <td>5000g</td> <td></td> </tr> <tr> <td>C</td> <td>500</td> <td>5000g</td> <td></td> </tr> <tr> <td>D</td> <td>500</td> <td>5000g</td> <td></td> </tr> </table>		L.A.R.T.		% SPEC.		A	100	5000g	% Loss	B	100	5000g		C	500	5000g		D	500	5000g																																																																																																									
SAND EQUIVALENT		MIN. SPEC.																																																																																																																																													
Sand R2	1.6	1.7	Avg.																																																																																																																																												
Clay R1	12.9	13.6																																																																																																																																													
S.E. Value	13	13	13																																																																																																																																												
L.A.R.T.		% SPEC.																																																																																																																																													
A	100	5000g	% Loss																																																																																																																																												
B	100	5000g																																																																																																																																													
C	500	5000g																																																																																																																																													
D	500	5000g																																																																																																																																													
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">DURABILITY INDEX</th> <th colspan="2">SPEC.</th> </tr> <tr> <td>Dura-Coarse</td> <td>Sed.Ht. =</td> <td></td> <td></td> </tr> <tr> <td>Dura-Fine</td> <td>R2/R1 =</td> <td></td> <td></td> </tr> </table>		DURABILITY INDEX		SPEC.		Dura-Coarse	Sed.Ht. =			Dura-Fine	R2/R1 =			<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">CLEANNESS VALUE</th> <th colspan="2">ORGANIC IMPURITIES</th> </tr> <tr> <td>NL</td> <td>SED. HT.</td> <td>RESULT</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>FILM STRIPPING</td> <td>ORGANIC IMPURITIES</td> <td></td> <td></td> </tr> <tr> <td>NM</td> <td>Satisfactory</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Unsatisfactory</td> <td></td> <td></td> </tr> </table>		CLEANNESS VALUE		ORGANIC IMPURITIES		NL	SED. HT.	RESULT						FILM STRIPPING	ORGANIC IMPURITIES			NM	Satisfactory				Unsatisfactory																																																																																																										
DURABILITY INDEX		SPEC.																																																																																																																																													
Dura-Coarse	Sed.Ht. =																																																																																																																																														
Dura-Fine	R2/R1 =																																																																																																																																														
CLEANNESS VALUE		ORGANIC IMPURITIES																																																																																																																																													
NL	SED. HT.	RESULT																																																																																																																																													
FILM STRIPPING	ORGANIC IMPURITIES																																																																																																																																														
NM	Satisfactory																																																																																																																																														
	Unsatisfactory																																																																																																																																														
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">TEST(S) REQUESTED</th> <th colspan="2">SAMPLE TYPE</th> </tr> <tr> <td><input checked="" type="checkbox"/> Fine Grade</td> <td>202</td> <td><input checked="" type="checkbox"/> A.B</td> <td>PCC</td> </tr> <tr> <td><input checked="" type="checkbox"/> Coarse Grade</td> <td>202</td> <td><input checked="" type="checkbox"/> A.S</td> <td>Bk.Fill</td> </tr> <tr> <td><input checked="" type="checkbox"/> Filler Material</td> <td>202</td> <td><input checked="" type="checkbox"/> EMB.</td> <td>MISC</td> </tr> <tr> <td><input checked="" type="checkbox"/> Mech. Analysis</td> <td>203</td> <td><input checked="" type="checkbox"/> O.G.</td> <td>Sub-Grade</td> </tr> <tr> <td><input checked="" type="checkbox"/> Plasticity Index</td> <td>204</td> <td><input checked="" type="checkbox"/> A.C. Agg.</td> <td>SOIL</td> </tr> <tr> <td><input checked="" type="checkbox"/> % Crushed Particles</td> <td>205</td> <td></td> <td>TL-101 S I C. NO.</td> </tr> <tr> <td><input checked="" type="checkbox"/> SpG. Coarse</td> <td>206</td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> SpG. Fine (SSI)</td> <td>207</td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> SpG. of Soils</td> <td>209</td> <td></td> <td>Expansion Index</td> </tr> <tr> <td><input checked="" type="checkbox"/> L.A.R.T.</td> <td>211</td> <td></td> <td>23.0</td> </tr> <tr> <td><input checked="" type="checkbox"/> Unit Wt.</td> <td>212</td> <td></td> <td>Low</td> </tr> <tr> <td><input checked="" type="checkbox"/> Organic Impurities</td> <td>213</td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Soundness</td> <td>214</td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Relative Compaction</td> <td>216</td> <td></td> <td>Dry Density</td> </tr> <tr> <td><input checked="" type="checkbox"/> Sand Equivalent</td> <td>217</td> <td></td> <td>116.20 pcf</td> </tr> <tr> <td><input checked="" type="checkbox"/> Moisture Content</td> <td>226</td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Cleaness Value</td> <td>227</td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Durability Fine</td> <td>229</td> <td></td> <td>Max. Dry Density (pcf)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Durability Coarse</td> <td>229</td> <td></td> <td>Opt. Moist Content (%)</td> </tr> <tr> <td><input checked="" type="checkbox"/> Flat & Elongated</td> <td>ASTM D 4791</td> <td></td> <td>Laboratory Remarks:</td> </tr> <tr> <td><input checked="" type="checkbox"/> R-Value</td> <td>301</td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Fine Agg Angularity</td> <td>AASHTO T 304</td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Mortar Strength</td> <td>515</td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> pH (RC)</td> <td>552</td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Resistivity (RC)</td> <td>532</td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> pH (CMP)</td> <td>643</td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Resistivity (CMP)</td> <td>643</td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Expansion Index</td> <td>UBC-29-2</td> <td></td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Max. Dry Density/ Opt. Moist Content</td> <td>ASTM-D1557</td> <td></td> <td></td> </tr> </table>		TEST(S) REQUESTED		SAMPLE TYPE		<input checked="" type="checkbox"/> Fine Grade	202	<input checked="" type="checkbox"/> A.B	PCC	<input checked="" type="checkbox"/> Coarse Grade	202	<input checked="" type="checkbox"/> A.S	Bk.Fill	<input checked="" type="checkbox"/> Filler Material	202	<input checked="" type="checkbox"/> EMB.	MISC	<input checked="" type="checkbox"/> Mech. Analysis	203	<input checked="" type="checkbox"/> O.G.	Sub-Grade	<input checked="" type="checkbox"/> Plasticity Index	204	<input checked="" type="checkbox"/> A.C. Agg.	SOIL	<input checked="" type="checkbox"/> % Crushed Particles	205		TL-101 S I C. NO.	<input checked="" type="checkbox"/> SpG. Coarse	206			<input checked="" type="checkbox"/> SpG. Fine (SSI)	207			<input checked="" type="checkbox"/> SpG. of Soils	209		Expansion Index	<input checked="" type="checkbox"/> L.A.R.T.	211		23.0	<input checked="" type="checkbox"/> Unit Wt.	212		Low	<input checked="" type="checkbox"/> Organic Impurities	213			<input checked="" type="checkbox"/> Soundness	214			<input checked="" type="checkbox"/> Relative Compaction	216		Dry Density	<input checked="" type="checkbox"/> Sand Equivalent	217		116.20 pcf	<input checked="" type="checkbox"/> Moisture Content	226			<input checked="" type="checkbox"/> Cleaness Value	227			<input checked="" type="checkbox"/> Durability Fine	229		Max. Dry Density (pcf)	<input checked="" type="checkbox"/> Durability Coarse	229		Opt. Moist Content (%)	<input checked="" type="checkbox"/> Flat & Elongated	ASTM D 4791		Laboratory Remarks:	<input checked="" type="checkbox"/> R-Value	301			<input checked="" type="checkbox"/> Fine Agg Angularity	AASHTO T 304			<input checked="" type="checkbox"/> Mortar Strength	515			<input checked="" type="checkbox"/> pH (RC)	552			<input checked="" type="checkbox"/> Resistivity (RC)	532			<input checked="" type="checkbox"/> pH (CMP)	643			<input checked="" type="checkbox"/> Resistivity (CMP)	643			<input checked="" type="checkbox"/> Expansion Index	UBC-29-2			<input checked="" type="checkbox"/> Max. Dry Density/ Opt. Moist Content	ASTM-D1557			<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">CONTRACT NO.</th> <th colspan="2">LAB. NO.</th> </tr> <tr> <td>1 2 0 M 3 5 0 1</td> <td>6/11/15</td> <td>1 2 - 0 M 3 5 0 1</td> <td>5114B</td> </tr> <tr> <td>DATE RCVD:</td> <td>6/29/15</td> <td>DATE OUT:</td> <td>5114B</td> </tr> <tr> <td>NUMBER OF CONTAINERS:</td> <td>1 Bag</td> <td>By:</td> <td>FAX MAIL PHONE OTHER</td> </tr> <tr> <td>NORMAL PRIORITY DATE NEEDED:</td> <td></td> <td></td> <td></td> </tr> </table>		CONTRACT NO.		LAB. NO.		1 2 0 M 3 5 0 1	6/11/15	1 2 - 0 M 3 5 0 1	5114B	DATE RCVD:	6/29/15	DATE OUT:	5114B	NUMBER OF CONTAINERS:	1 Bag	By:	FAX MAIL PHONE OTHER	NORMAL PRIORITY DATE NEEDED:			
TEST(S) REQUESTED		SAMPLE TYPE																																																																																																																																													
<input checked="" type="checkbox"/> Fine Grade	202	<input checked="" type="checkbox"/> A.B	PCC																																																																																																																																												
<input checked="" type="checkbox"/> Coarse Grade	202	<input checked="" type="checkbox"/> A.S	Bk.Fill																																																																																																																																												
<input checked="" type="checkbox"/> Filler Material	202	<input checked="" type="checkbox"/> EMB.	MISC																																																																																																																																												
<input checked="" type="checkbox"/> Mech. Analysis	203	<input checked="" type="checkbox"/> O.G.	Sub-Grade																																																																																																																																												
<input checked="" type="checkbox"/> Plasticity Index	204	<input checked="" type="checkbox"/> A.C. Agg.	SOIL																																																																																																																																												
<input checked="" type="checkbox"/> % Crushed Particles	205		TL-101 S I C. NO.																																																																																																																																												
<input checked="" type="checkbox"/> SpG. Coarse	206																																																																																																																																														
<input checked="" type="checkbox"/> SpG. Fine (SSI)	207																																																																																																																																														
<input checked="" type="checkbox"/> SpG. of Soils	209		Expansion Index																																																																																																																																												
<input checked="" type="checkbox"/> L.A.R.T.	211		23.0																																																																																																																																												
<input checked="" type="checkbox"/> Unit Wt.	212		Low																																																																																																																																												
<input checked="" type="checkbox"/> Organic Impurities	213																																																																																																																																														
<input checked="" type="checkbox"/> Soundness	214																																																																																																																																														
<input checked="" type="checkbox"/> Relative Compaction	216		Dry Density																																																																																																																																												
<input checked="" type="checkbox"/> Sand Equivalent	217		116.20 pcf																																																																																																																																												
<input checked="" type="checkbox"/> Moisture Content	226																																																																																																																																														
<input checked="" type="checkbox"/> Cleaness Value	227																																																																																																																																														
<input checked="" type="checkbox"/> Durability Fine	229		Max. Dry Density (pcf)																																																																																																																																												
<input checked="" type="checkbox"/> Durability Coarse	229		Opt. Moist Content (%)																																																																																																																																												
<input checked="" type="checkbox"/> Flat & Elongated	ASTM D 4791		Laboratory Remarks:																																																																																																																																												
<input checked="" type="checkbox"/> R-Value	301																																																																																																																																														
<input checked="" type="checkbox"/> Fine Agg Angularity	AASHTO T 304																																																																																																																																														
<input checked="" type="checkbox"/> Mortar Strength	515																																																																																																																																														
<input checked="" type="checkbox"/> pH (RC)	552																																																																																																																																														
<input checked="" type="checkbox"/> Resistivity (RC)	532																																																																																																																																														
<input checked="" type="checkbox"/> pH (CMP)	643																																																																																																																																														
<input checked="" type="checkbox"/> Resistivity (CMP)	643																																																																																																																																														
<input checked="" type="checkbox"/> Expansion Index	UBC-29-2																																																																																																																																														
<input checked="" type="checkbox"/> Max. Dry Density/ Opt. Moist Content	ASTM-D1557																																																																																																																																														
CONTRACT NO.		LAB. NO.																																																																																																																																													
1 2 0 M 3 5 0 1	6/11/15	1 2 - 0 M 3 5 0 1	5114B																																																																																																																																												
DATE RCVD:	6/29/15	DATE OUT:	5114B																																																																																																																																												
NUMBER OF CONTAINERS:	1 Bag	By:	FAX MAIL PHONE OTHER																																																																																																																																												
NORMAL PRIORITY DATE NEEDED:																																																																																																																																															

SRL SOIL & AGGREGATE TESTS

Sample of: Subsurface Soils from Boring MB-3		SRL Lab. Stamp																																																																																																																									
Sampled from: 0-5' below the surface		By _____ for _____																																																																																																																									
Material Source: Rt Shld of SB I-405 on ramp from N.B. Culver Dr.		D. OZOWARA SRL Materials Engineer																																																																																																																									
Owner / Mfr.: Caltrans		SOUTHERN REGIONAL LABORATORY 13970 Victoria Street Fontana, CA 92336 Phone: (909) 350 9039 Fax: (909) 829 6294																																																																																																																									
Date Sampled: 6/8/15		R.E.: Mehrdad Mahdavian Address: Caltrans-Dist. 12 Phone No.: (949) 756-4927 Fax No.: (949) 724-2519																																																																																																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">GRADING ANALYSIS</th> </tr> <tr> <td>Total Wt.</td> <td>14624 g</td> <td>By:</td> <td></td> </tr> <tr> <td>Size (mm)</td> <td>Acc. Wt. Ret.</td> <td>% Ret.</td> <td>% Pass</td> </tr> <tr> <td>0</td> <td>25</td> <td>0</td> <td>100</td> </tr> <tr> <td>52</td> <td>19</td> <td>52</td> <td>0</td> </tr> <tr> <td>137</td> <td>12.5</td> <td>189</td> <td>1</td> </tr> <tr> <td>125</td> <td>9.5</td> <td>314</td> <td>2</td> </tr> <tr> <td>283</td> <td>4.75</td> <td>597</td> <td>4</td> </tr> <tr> <td>14027</td> <td>14624</td> <td></td> <td></td> </tr> </table>				GRADING ANALYSIS				Total Wt.	14624 g	By:		Size (mm)	Acc. Wt. Ret.	% Ret.	% Pass	0	25	0	100	52	19	52	0	137	12.5	189	1	125	9.5	314	2	283	4.75	597	4	14027	14624																																																																																						
GRADING ANALYSIS																																																																																																																											
Total Wt.	14624 g	By:																																																																																																																									
Size (mm)	Acc. Wt. Ret.	% Ret.	% Pass																																																																																																																								
0	25	0	100																																																																																																																								
52	19	52	0																																																																																																																								
137	12.5	189	1																																																																																																																								
125	9.5	314	2																																																																																																																								
283	4.75	597	4																																																																																																																								
14027	14624																																																																																																																										
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">R-VALUE BATCH</th> </tr> <tr> <td>% Run</td> <td>Size</td> <td>Wt.</td> <td>% Ret. x (Wt. Cr. / Tot. Wt.) = Prod.</td> </tr> <tr> <td>100</td> <td>25 mm</td> <td>1200</td> <td></td> </tr> <tr> <td>99</td> <td>19 mm</td> <td>1188</td> <td></td> </tr> <tr> <td>98</td> <td>12.5 mm</td> <td>1176</td> <td></td> </tr> <tr> <td>96</td> <td>9.5 mm</td> <td>1152</td> <td></td> </tr> <tr> <td></td> <td>4.75 mm</td> <td></td> <td></td> </tr> </table>				R-VALUE BATCH				% Run	Size	Wt.	% Ret. x (Wt. Cr. / Tot. Wt.) = Prod.	100	25 mm	1200		99	19 mm	1188		98	12.5 mm	1176		96	9.5 mm	1152			4.75 mm																																																																																														
R-VALUE BATCH																																																																																																																											
% Run	Size	Wt.	% Ret. x (Wt. Cr. / Tot. Wt.) = Prod.																																																																																																																								
100	25 mm	1200																																																																																																																									
99	19 mm	1188																																																																																																																									
98	12.5 mm	1176																																																																																																																									
96	9.5 mm	1152																																																																																																																									
	4.75 mm																																																																																																																										
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">FINE GRADE / MECHANICAL ANALYSIS</th> </tr> <tr> <td>Dry Wt. (g)</td> <td>2.36 mm</td> <td>9</td> <td>2</td> </tr> <tr> <td></td> <td>1.18 mm</td> <td>26</td> <td>5</td> </tr> <tr> <td>492.0 g</td> <td>600 µm</td> <td>62</td> <td>13</td> </tr> <tr> <td></td> <td>300 µm</td> <td>121</td> <td>25</td> </tr> <tr> <td></td> <td>150 µm</td> <td>196</td> <td>40</td> </tr> <tr> <td></td> <td>75 µm</td> <td>251</td> <td>51</td> </tr> <tr> <td></td> <td></td> <td></td> <td>49</td> </tr> <tr> <td></td> <td></td> <td></td> <td>47.0</td> </tr> </table>				FINE GRADE / MECHANICAL ANALYSIS				Dry Wt. (g)	2.36 mm	9	2		1.18 mm	26	5	492.0 g	600 µm	62	13		300 µm	121	25		150 µm	196	40		75 µm	251	51				49				47.0																																																																																				
FINE GRADE / MECHANICAL ANALYSIS																																																																																																																											
Dry Wt. (g)	2.36 mm	9	2																																																																																																																								
	1.18 mm	26	5																																																																																																																								
492.0 g	600 µm	62	13																																																																																																																								
	300 µm	121	25																																																																																																																								
	150 µm	196	40																																																																																																																								
	75 µm	251	51																																																																																																																								
			49																																																																																																																								
			47.0																																																																																																																								
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">MECH. / HYDRO.</th> </tr> <tr> <td>1hr.</td> <td>5M</td> <td></td> <td></td> </tr> <tr> <td>24hr.</td> <td>1M</td> <td></td> <td></td> </tr> </table>				MECH. / HYDRO.				1hr.	5M			24hr.	1M																																																																																																														
MECH. / HYDRO.																																																																																																																											
1hr.	5M																																																																																																																										
24hr.	1M																																																																																																																										
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">SAND EQUIVALENT</th> </tr> <tr> <td>Sand R2</td> <td>1.0</td> <td>1.1</td> <td>Avg.</td> </tr> <tr> <td>Clay R1</td> <td>13.9</td> <td>13.9</td> <td></td> </tr> <tr> <td>S.E. Value</td> <td>8</td> <td>8</td> <td></td> </tr> </table>				SAND EQUIVALENT				Sand R2	1.0	1.1	Avg.	Clay R1	13.9	13.9		S.E. Value	8	8																																																																																																									
SAND EQUIVALENT																																																																																																																											
Sand R2	1.0	1.1	Avg.																																																																																																																								
Clay R1	13.9	13.9																																																																																																																									
S.E. Value	8	8																																																																																																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">L.A.R.T.</th> </tr> <tr> <td>Rev.</td> <td>Wt.</td> <td>Wt. Ret.</td> <td>% Loss</td> </tr> <tr> <td>A</td> <td>100</td> <td>5000g</td> <td></td> </tr> <tr> <td>C</td> <td>500</td> <td>5000g</td> <td></td> </tr> <tr> <td colspan="2">No. of spheres =</td> <td colspan="2">Wt. of spheres =</td> </tr> </table>				L.A.R.T.				Rev.	Wt.	Wt. Ret.	% Loss	A	100	5000g		C	500	5000g		No. of spheres =		Wt. of spheres =																																																																																																					
L.A.R.T.																																																																																																																											
Rev.	Wt.	Wt. Ret.	% Loss																																																																																																																								
A	100	5000g																																																																																																																									
C	500	5000g																																																																																																																									
No. of spheres =		Wt. of spheres =																																																																																																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">DURABILITY INDEX</th> </tr> <tr> <td>Dura-Coarse</td> <td>Sed.Ht. =</td> <td></td> <td></td> </tr> <tr> <td>Dura-Fine</td> <td>R2/R1 =</td> <td></td> <td></td> </tr> </table>				DURABILITY INDEX				Dura-Coarse	Sed.Ht. =			Dura-Fine	R2/R1 =																																																																																																														
DURABILITY INDEX																																																																																																																											
Dura-Coarse	Sed.Ht. =																																																																																																																										
Dura-Fine	R2/R1 =																																																																																																																										
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">R-VALUE SPEC.</th> </tr> <tr> <td>RESULT</td> <td>SP. G. FINE (SSD)</td> <td>MOISTURE CONTENT</td> <td>PLASTICITY INDEX</td> </tr> <tr> <td>4</td> <td></td> <td></td> <td>32</td> </tr> <tr> <td>(B) S.S. Dry</td> <td></td> <td></td> <td></td> </tr> <tr> <td>(A) Ov. Dry</td> <td></td> <td></td> <td>15</td> </tr> <tr> <td>ABS. %</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Wt. S+C+H2O</td> <td></td> <td></td> <td>17</td> </tr> <tr> <td>Wt. S+C</td> <td></td> <td></td> <td></td> </tr> <tr> <td>W=wt. H2O</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Bulk = 500 - W</td> <td></td> <td></td> <td></td> </tr> <tr> <td>SP GR. COARSE CT206/CT209, +4</td> <td></td> <td></td> <td></td> </tr> <tr> <td>(B) S.S. Dry</td> <td></td> <td></td> <td></td> </tr> <tr> <td>(A) Ov. Dry</td> <td></td> <td></td> <td></td> </tr> <tr> <td>ABS. %</td> <td></td> <td></td> <td></td> </tr> <tr> <td>(C) Wt. S. in H2O</td> <td></td> <td></td> <td></td> </tr> <tr> <td>App = $\frac{A}{A-C}$</td> <td></td> <td></td> <td></td> </tr> <tr> <td>SSD = $\frac{B}{B-C}$</td> <td></td> <td></td> <td></td> </tr> <tr> <td>OD = $\frac{A}{B-C}$</td> <td></td> <td></td> <td></td> </tr> </table>				R-VALUE SPEC.				RESULT	SP. G. FINE (SSD)	MOISTURE CONTENT	PLASTICITY INDEX	4			32	(B) S.S. Dry				(A) Ov. Dry			15	ABS. %				Wt. S+C+H2O			17	Wt. S+C				W=wt. H2O				Bulk = 500 - W				SP GR. COARSE CT206/CT209, +4				(B) S.S. Dry				(A) Ov. Dry				ABS. %				(C) Wt. S. in H2O				App = $\frac{A}{A-C}$				SSD = $\frac{B}{B-C}$				OD = $\frac{A}{B-C}$																																																			
R-VALUE SPEC.																																																																																																																											
RESULT	SP. G. FINE (SSD)	MOISTURE CONTENT	PLASTICITY INDEX																																																																																																																								
4			32																																																																																																																								
(B) S.S. Dry																																																																																																																											
(A) Ov. Dry			15																																																																																																																								
ABS. %																																																																																																																											
Wt. S+C+H2O			17																																																																																																																								
Wt. S+C																																																																																																																											
W=wt. H2O																																																																																																																											
Bulk = 500 - W																																																																																																																											
SP GR. COARSE CT206/CT209, +4																																																																																																																											
(B) S.S. Dry																																																																																																																											
(A) Ov. Dry																																																																																																																											
ABS. %																																																																																																																											
(C) Wt. S. in H2O																																																																																																																											
App = $\frac{A}{A-C}$																																																																																																																											
SSD = $\frac{B}{B-C}$																																																																																																																											
OD = $\frac{A}{B-C}$																																																																																																																											
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">PH / RESISTIVITY</th> </tr> <tr> <td>Field</td> <td>Lab.</td> <td></td> <td></td> </tr> <tr> <td>Soil pH</td> <td>9.03</td> <td></td> <td></td> </tr> <tr> <td>H2O</td> <td>5.70</td> <td></td> <td></td> </tr> <tr> <td>Min. Resistivity</td> <td>1058</td> <td></td> <td></td> </tr> <tr> <td colspan="2">Based on 18 gauge CMP.</td> <td></td> <td></td> </tr> <tr> <td colspan="2">Estimated life: 26 yrs.</td> <td></td> <td></td> </tr> </table>				PH / RESISTIVITY				Field	Lab.			Soil pH	9.03			H2O	5.70			Min. Resistivity	1058			Based on 18 gauge CMP.				Estimated life: 26 yrs.																																																																																															
PH / RESISTIVITY																																																																																																																											
Field	Lab.																																																																																																																										
Soil pH	9.03																																																																																																																										
H2O	5.70																																																																																																																										
Min. Resistivity	1058																																																																																																																										
Based on 18 gauge CMP.																																																																																																																											
Estimated life: 26 yrs.																																																																																																																											
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">CLEANNESS VALUE</th> </tr> <tr> <td>NL</td> <td>SED. HT.</td> <td>RESULT</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </table>				CLEANNESS VALUE				NL	SED. HT.	RESULT																																																																																																																	
CLEANNESS VALUE																																																																																																																											
NL	SED. HT.	RESULT																																																																																																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">FILM STRIPPING</th> </tr> <tr> <td>NM</td> <td>ORGANIC IMPURITIES</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Satisfactory</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Unsatisfactory</td> <td></td> <td></td> </tr> </table>				FILM STRIPPING				NM	ORGANIC IMPURITIES				Satisfactory				Unsatisfactory																																																																																																										
FILM STRIPPING																																																																																																																											
NM	ORGANIC IMPURITIES																																																																																																																										
	Satisfactory																																																																																																																										
	Unsatisfactory																																																																																																																										
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">SPECIFIC GRAVITY OF SOILS</th> </tr> <tr> <td>Wt Oven Dry Soil (Wo)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Wt Pycnometer + H2O (Wa)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Wt Pycnometer + H2O + Soil (Wb)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Wo / (Wo + Wa - Wb)</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Spec. Grav.</td> <td></td> <td></td> <td></td> </tr> </table>				SPECIFIC GRAVITY OF SOILS				Wt Oven Dry Soil (Wo)				Wt Pycnometer + H2O (Wa)				Wt Pycnometer + H2O + Soil (Wb)				Wo / (Wo + Wa - Wb)				Spec. Grav.																																																																																																			
SPECIFIC GRAVITY OF SOILS																																																																																																																											
Wt Oven Dry Soil (Wo)																																																																																																																											
Wt Pycnometer + H2O (Wa)																																																																																																																											
Wt Pycnometer + H2O + Soil (Wb)																																																																																																																											
Wo / (Wo + Wa - Wb)																																																																																																																											
Spec. Grav.																																																																																																																											
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">CONTRACT NO.</th> </tr> <tr> <td>1</td> <td>2</td> <td>0</td> <td>M</td> </tr> <tr> <td>3</td> <td>5</td> <td>0</td> <td>1</td> </tr> <tr> <td>6/1/15</td> <td></td> <td></td> <td></td> </tr> </table>				CONTRACT NO.				1	2	0	M	3	5	0	1	6/1/15																																																																																																											
CONTRACT NO.																																																																																																																											
1	2	0	M																																																																																																																								
3	5	0	1																																																																																																																								
6/1/15																																																																																																																											
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">TEST(S) REQUESTED</th> </tr> <tr> <td>■ Fine Grade</td> <td>202</td> <td>A.B.</td> <td>✓</td> </tr> <tr> <td>■ Coarse Grade</td> <td>202</td> <td>A.S.</td> <td>✓</td> </tr> <tr> <td>■ Filler Material</td> <td>202</td> <td>EMB.</td> <td>✓</td> </tr> <tr> <td>■ Mech. Analysis</td> <td>203</td> <td>O.G.</td> <td>✓</td> </tr> <tr> <td>■ Plasticity Index</td> <td>204</td> <td>A.C. Agg.</td> <td>✓</td> </tr> <tr> <td>■ % Crushed Particles</td> <td>205</td> <td></td> <td></td> </tr> <tr> <td>■ SpG. Coarse</td> <td>206</td> <td></td> <td></td> </tr> <tr> <td>■ SpG. Fine (SSD)</td> <td>207</td> <td></td> <td></td> </tr> <tr> <td>■ SpG. of Soils</td> <td>209</td> <td></td> <td></td> </tr> <tr> <td>■ L.A.R.T.</td> <td>211</td> <td></td> <td></td> </tr> <tr> <td>■ Unit Wt.</td> <td>212</td> <td></td> <td></td> </tr> <tr> <td>■ Organic Impurities</td> <td>213</td> <td></td> <td></td> </tr> <tr> <td>■ Soundness</td> <td>214</td> <td></td> <td></td> </tr> <tr> <td>■ Relative Compaction</td> <td>216</td> <td></td> <td></td> </tr> <tr> <td>■ Sand Equivalent</td> <td>217</td> <td></td> <td></td> </tr> <tr> <td>■ Moisture Content</td> <td>226</td> <td></td> <td></td> </tr> <tr> <td>■ Cleaness Value</td> <td>227</td> <td></td> <td></td> </tr> <tr> <td>■ Durability Fine</td> <td>229</td> <td></td> <td></td> </tr> <tr> <td>■ Durability Coarse</td> <td>229</td> <td></td> <td></td> </tr> <tr> <td>■ Flat & Elongated</td> <td>ASTM D 4791</td> <td></td> <td></td> </tr> <tr> <td>■ R-Value</td> <td>301</td> <td></td> <td></td> </tr> <tr> <td>■ Fine Agg Angularity</td> <td>AASHTO T 304</td> <td></td> <td></td> </tr> <tr> <td>■ Mortar Strength</td> <td>515</td> <td></td> <td></td> </tr> <tr> <td>■ pH (RC)</td> <td>532</td> <td></td> <td></td> </tr> <tr> <td>■ Resistivity (RC)</td> <td>532</td> <td></td> <td></td> </tr> <tr> <td>■ pH (CMP)</td> <td>643</td> <td></td> <td></td> </tr> <tr> <td>■ Resistivity (CMP)</td> <td>643</td> <td></td> <td></td> </tr> <tr> <td>■ Expansion Index</td> <td>UBC-29-2</td> <td></td> <td></td> </tr> <tr> <td>■ Max. Dry Density / Opt. Moist Content</td> <td>ASTM-D1557</td> <td></td> <td></td> </tr> </table>				TEST(S) REQUESTED				■ Fine Grade	202	A.B.	✓	■ Coarse Grade	202	A.S.	✓	■ Filler Material	202	EMB.	✓	■ Mech. Analysis	203	O.G.	✓	■ Plasticity Index	204	A.C. Agg.	✓	■ % Crushed Particles	205			■ SpG. Coarse	206			■ SpG. Fine (SSD)	207			■ SpG. of Soils	209			■ L.A.R.T.	211			■ Unit Wt.	212			■ Organic Impurities	213			■ Soundness	214			■ Relative Compaction	216			■ Sand Equivalent	217			■ Moisture Content	226			■ Cleaness Value	227			■ Durability Fine	229			■ Durability Coarse	229			■ Flat & Elongated	ASTM D 4791			■ R-Value	301			■ Fine Agg Angularity	AASHTO T 304			■ Mortar Strength	515			■ pH (RC)	532			■ Resistivity (RC)	532			■ pH (CMP)	643			■ Resistivity (CMP)	643			■ Expansion Index	UBC-29-2			■ Max. Dry Density / Opt. Moist Content	ASTM-D1557		
TEST(S) REQUESTED																																																																																																																											
■ Fine Grade	202	A.B.	✓																																																																																																																								
■ Coarse Grade	202	A.S.	✓																																																																																																																								
■ Filler Material	202	EMB.	✓																																																																																																																								
■ Mech. Analysis	203	O.G.	✓																																																																																																																								
■ Plasticity Index	204	A.C. Agg.	✓																																																																																																																								
■ % Crushed Particles	205																																																																																																																										
■ SpG. Coarse	206																																																																																																																										
■ SpG. Fine (SSD)	207																																																																																																																										
■ SpG. of Soils	209																																																																																																																										
■ L.A.R.T.	211																																																																																																																										
■ Unit Wt.	212																																																																																																																										
■ Organic Impurities	213																																																																																																																										
■ Soundness	214																																																																																																																										
■ Relative Compaction	216																																																																																																																										
■ Sand Equivalent	217																																																																																																																										
■ Moisture Content	226																																																																																																																										
■ Cleaness Value	227																																																																																																																										
■ Durability Fine	229																																																																																																																										
■ Durability Coarse	229																																																																																																																										
■ Flat & Elongated	ASTM D 4791																																																																																																																										
■ R-Value	301																																																																																																																										
■ Fine Agg Angularity	AASHTO T 304																																																																																																																										
■ Mortar Strength	515																																																																																																																										
■ pH (RC)	532																																																																																																																										
■ Resistivity (RC)	532																																																																																																																										
■ pH (CMP)	643																																																																																																																										
■ Resistivity (CMP)	643																																																																																																																										
■ Expansion Index	UBC-29-2																																																																																																																										
■ Max. Dry Density / Opt. Moist Content	ASTM-D1557																																																																																																																										
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">SAMPLE NO.</th> </tr> <tr> <td>1</td> <td>2</td> <td>0</td> <td>M</td> </tr> <tr> <td>3</td> <td>5</td> <td>0</td> <td>1</td> </tr> <tr> <td>6/1/15</td> <td></td> <td></td> <td></td> </tr> </table>				SAMPLE NO.				1	2	0	M	3	5	0	1	6/1/15																																																																																																											
SAMPLE NO.																																																																																																																											
1	2	0	M																																																																																																																								
3	5	0	1																																																																																																																								
6/1/15																																																																																																																											
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">DATE</th> </tr> <tr> <td>RCVD.</td> <td>6/1/15</td> <td>DATE</td> <td>6/30/15</td> </tr> <tr> <td>NUMBER OF CONTAINERS:</td> <td>1 Bag</td> <td>By:</td> <td>FAX MAIL PHONE OTHER</td> </tr> <tr> <td>NORMAL</td> <td>PRIORITY</td> <td>DATE NEEDED:</td> <td></td> </tr> </table>				DATE				RCVD.	6/1/15	DATE	6/30/15	NUMBER OF CONTAINERS:	1 Bag	By:	FAX MAIL PHONE OTHER	NORMAL	PRIORITY	DATE NEEDED:																																																																																																									
DATE																																																																																																																											
RCVD.	6/1/15	DATE	6/30/15																																																																																																																								
NUMBER OF CONTAINERS:	1 Bag	By:	FAX MAIL PHONE OTHER																																																																																																																								
NORMAL	PRIORITY	DATE NEEDED:																																																																																																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">LAB. NO.</th> </tr> <tr> <td>5</td> <td>1</td> <td>1</td> <td>6</td> </tr> <tr> <td colspan="4">B</td> </tr> </table>				LAB. NO.				5	1	1	6	B																																																																																																															
LAB. NO.																																																																																																																											
5	1	1	6																																																																																																																								
B																																																																																																																											

SRL SOIL & AGGREGATE TESTS

Sample of: Subsurface Soils from Boring MB-4		SRL Lab. Stamp	
Sampled from: 0-5' below the surface		By _____ for _____	
Material Source: Rt Shld of SB L-405 @ Sta 342		D. OZOWARA	
Owner / Mfr.: Caltrans		SRL Materials Engineer	
Date Sampled: 6/8/15		SOUTHERN REGIONAL LABORATORY	
Address: Caltrans-Dist. 12		13970 Victoria Street	
Phone No.: (949) 756-4927		Fontana, CA 92336	
Fax No.: (949) 724-2519		Phone: (909) 350 9039	
		Fax: (909) 829 6294	
		SPEC.	
		R-VALUE BATCH	
		% Run	
		Size	
		Wt.	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	
		90	
		10287	
		10287	
		100	
		99	
		99	
		96	
		94	

SRL SOIL & AGGREGATE TESTS

Sample of: Subsurface Soils from Boring MB-5 Sampled from: 0-5' below the surface Material Source: Rt. Shld of I-405 south @ Sta 325 Owner / Mfr.: Caltrans		SRL Lab. Stamp By: _____ for D. OZOWARA SRL Materials Engineer	
Date Sampled: 6/8/15 GRADING ANALYSIS Total Wt. 14946 g By: _____ Date: _____ Size Acc. Wt. Ret. % Ret. % Pass % Pass (mm) (mm) (mm) (mm) (mm) (mm)		R.E.: Mehrood Mahdavian Address: Caltrans-Dist. 12 Southern Regional Laboratory 13970 Victoria Street Fontana, CA 92336 Phone: (909) 350 9039 Fax: (909) 829 6294	
Date Sampled: 6/11/15 CONTRACT NO. 1 SAMPLE NO. MB-5 DATE OUT: 7/7/15 NUMBER OF CONTAINERS: 1 Bag NORMAL PRIORITY DATE NEEDED: <input checked="" type="checkbox"/>		5118B LAB. NO. By: _____ FAX _____ MAIL _____ PHONE _____ OTHER _____	
R-VALUE BATCH % Rm Size Wt. SPEC. 100 25 mm 1200 99 19 mm 1164 98 12.5 mm 1128 97 9.5 mm 1080 94 4.75 mm 1080		% CRUSHED PARTICLES % Ret. x (Wt. Cr./Tot. Wt.) = Prod. SPEC. Wtd. Avg. % CP Ret. No. 4 = % CP = P/R	
FINE GRADE / MECHANICAL ANALYSIS Dry Wt. (g) 2.36 mm 33 6 94 82 1.18 mm 96 19 81 70 600 µm 194 38 62 54 300 µm 292 57 43 37 150 µm 357 70 30 26 75 µm 392 77 23 20		MOISTURE CONTENT Gr. Wet Gr. Dry H2O Tare Net Dry % H2O L.L. P.L. P.I. 25 17 8	
MECH. / HYDRO. R Corr. C.R. Mat In % In. Sus Comb % In. Sus 1hr. 5M 1M 24hr. 1M		pH / RESISTIVITY Soil pH Field Lab. 8.46 H2O 5.70 Min. Resistivity 2854 Based on 18 gauge CMP. Estimated life: 38 yrs.	
SAND EQUIVALENT Sand R2 2.7 2.5 Avg. 13.1 Clay R1 13.1 13.1 S.E. Value 21 20 21 L.A.R.T. Rev. Wt. Ret. % Ret. % Loss A B 100 5000g C D 500 5000g		CLEANNESS VALUE NL SED. HT. RESULT FILM STRIPPING NM ORGANIC IMPURITIES Satisfactory Unsatisfactory	
No. of spheres = _____ Wt. of spheres = _____ DURABILITY INDEX Dura-Coarse Sed.Ht. = _____ Dura-Fine R2/R1 = _____		SPECIFIC GRAVITY OF SOILS Wt Oven Dry Soil (Wo) Wt Pycnometer + H2O (Wa) Wt Pycnometer + H2O + Soil (Wb) Wo / (Wo + Wa - Wb) Wo Spec. Grav. Wb	
DURABILITY INDEX R2/R1 = _____		EXPANSION INDEX 1.0 Very Low Dry Density 115.90 pcf	
TEST(S) REQUESTED <input checked="" type="checkbox"/> Fine Grade <input checked="" type="checkbox"/> Coarse Grade <input checked="" type="checkbox"/> Filler Material <input checked="" type="checkbox"/> Mech. Analysis <input checked="" type="checkbox"/> Plasticity Index <input checked="" type="checkbox"/> SpG. Coarse <input checked="" type="checkbox"/> SpG. Fine (SSD) <input checked="" type="checkbox"/> SpG. of Soils <input checked="" type="checkbox"/> L.A.R.T. <input checked="" type="checkbox"/> Unit Wt. <input checked="" type="checkbox"/> Organic Impurities <input checked="" type="checkbox"/> Soundness <input checked="" type="checkbox"/> Relative Compaction <input checked="" type="checkbox"/> Sand Equivalent <input checked="" type="checkbox"/> Moisture Content <input checked="" type="checkbox"/> Cleaness Value <input checked="" type="checkbox"/> Durability Fine <input checked="" type="checkbox"/> Flat & Elongated <input checked="" type="checkbox"/> R-Value <input checked="" type="checkbox"/> Fine Age Angularity <input checked="" type="checkbox"/> Mortar Strength <input checked="" type="checkbox"/> pH (RC) <input checked="" type="checkbox"/> Resistivity (RC) <input checked="" type="checkbox"/> pH (CMP) <input checked="" type="checkbox"/> Resistivity (CMP) <input checked="" type="checkbox"/> Expansion Index <input checked="" type="checkbox"/> Max. Dry Density/ <input checked="" type="checkbox"/> Opt. Moist Content		SAMPLE TYPE <input checked="" type="checkbox"/> A.B. <input checked="" type="checkbox"/> A.S. <input checked="" type="checkbox"/> EMB <input checked="" type="checkbox"/> O.G. <input checked="" type="checkbox"/> A.C. Agg. <input checked="" type="checkbox"/> SOIL TL-101 S1C NO Expansion Index 1.0 Very Low Dry Density 115.90 pcf	
CONTRACT NO. 1 DATE 6/11/15 PRIORITY <input checked="" type="checkbox"/> DATE NEEDED:		CONTRACT NO. 1 DATE 6/11/15 PRIORITY <input checked="" type="checkbox"/> DATE NEEDED:	
1 2 0 M 3 5 0 1 DATE 6/11/15 PRIORITY <input checked="" type="checkbox"/> DATE NEEDED:		1 2 0 M 3 5 0 1 DATE 6/11/15 PRIORITY <input checked="" type="checkbox"/> DATE NEEDED:	

SRL SOIL & AGGREGATE TESTS

Sample of: Subsurface Soils from Boring MB-6		SRL Lab. Stamp																																																																																																																																											
Sampled from: 0-5' below the surface		By _____ for _____																																																																																																																																											
Material Source: Rt Shld of I-405 south @ Sta 315		D. OZOWARA																																																																																																																																											
Owner / Mfr.: Caltrans		SRL Materials Engineer																																																																																																																																											
Date Sampled: 6/8/15		SOUTHERN REGIONAL LABORATORY 13970 Victoria Street Fontana, CA 92336 Phone: (909) 350 9039 Fax: (909) 829 6294																																																																																																																																											
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="4">GRADING ANALYSIS</th> </tr> <tr> <td>Total Wt.</td> <td>14070 g</td> <td>By:</td> <td>Date:</td> </tr> <tr> <td>Wt. Ret.</td> <td>Size (mm)</td> <td>Acc. Wt. Ret.</td> <td>Comb. % Pass</td> </tr> <tr> <td></td> <td></td> <td>% Ret.</td> <td>% Pass</td> </tr> <tr> <td></td> <td></td> <td></td> <td>SPEC.</td> </tr> <tr> <td>0</td> <td>50</td> <td>0</td> <td>100</td> </tr> <tr> <td>193</td> <td>37.5</td> <td>1</td> <td>99</td> </tr> <tr> <td>172</td> <td>25</td> <td>3</td> <td>97</td> </tr> <tr> <td>136</td> <td>19</td> <td>4</td> <td>96</td> </tr> <tr> <td>518</td> <td>12.5</td> <td>7</td> <td>93</td> </tr> <tr> <td>471</td> <td>9.5</td> <td>11</td> <td>89</td> </tr> <tr> <td>844</td> <td>4.75</td> <td>17</td> <td>83</td> </tr> <tr> <td>11736</td> <td>14070</td> <td></td> <td></td> </tr> </table>		GRADING ANALYSIS				Total Wt.	14070 g	By:	Date:	Wt. Ret.	Size (mm)	Acc. Wt. Ret.	Comb. % Pass			% Ret.	% Pass				SPEC.	0	50	0	100	193	37.5	1	99	172	25	3	97	136	19	4	96	518	12.5	7	93	471	9.5	11	89	844	4.75	17	83	11736	14070			<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">R-VALUE BATCH</th> <th colspan="2">% CRUSHED PARTICLES</th> <th colspan="2">SPEC.</th> </tr> <tr> <td>% Run</td> <td>Size</td> <td>Wt.</td> <td>% Ret. x (Wt. Cr. / Tot. Wt.) = Prod.</td> <td>Wtd.</td> <td></td> </tr> <tr> <td></td> <td>25 mm</td> <td></td> <td></td> <td>Avg.</td> <td></td> </tr> <tr> <td>100</td> <td>19 mm</td> <td>1200</td> <td></td> <td>% CP</td> <td></td> </tr> <tr> <td>97</td> <td>12.5 mm</td> <td>1164</td> <td></td> <td>Ret.</td> <td></td> </tr> <tr> <td>93</td> <td>9.5 mm</td> <td>1116</td> <td></td> <td>No. 4 =</td> <td></td> </tr> <tr> <td>86</td> <td>4.75 mm</td> <td>1032</td> <td></td> <td>% CP = P/R</td> <td></td> </tr> </table>		R-VALUE BATCH		% CRUSHED PARTICLES		SPEC.		% Run	Size	Wt.	% Ret. x (Wt. Cr. / Tot. Wt.) = Prod.	Wtd.			25 mm			Avg.		100	19 mm	1200		% CP		97	12.5 mm	1164		Ret.		93	9.5 mm	1116		No. 4 =		86	4.75 mm	1032		% CP = P/R																																													
GRADING ANALYSIS																																																																																																																																													
Total Wt.	14070 g	By:	Date:																																																																																																																																										
Wt. Ret.	Size (mm)	Acc. Wt. Ret.	Comb. % Pass																																																																																																																																										
		% Ret.	% Pass																																																																																																																																										
			SPEC.																																																																																																																																										
0	50	0	100																																																																																																																																										
193	37.5	1	99																																																																																																																																										
172	25	3	97																																																																																																																																										
136	19	4	96																																																																																																																																										
518	12.5	7	93																																																																																																																																										
471	9.5	11	89																																																																																																																																										
844	4.75	17	83																																																																																																																																										
11736	14070																																																																																																																																												
R-VALUE BATCH		% CRUSHED PARTICLES		SPEC.																																																																																																																																									
% Run	Size	Wt.	% Ret. x (Wt. Cr. / Tot. Wt.) = Prod.	Wtd.																																																																																																																																									
	25 mm			Avg.																																																																																																																																									
100	19 mm	1200		% CP																																																																																																																																									
97	12.5 mm	1164		Ret.																																																																																																																																									
93	9.5 mm	1116		No. 4 =																																																																																																																																									
86	4.75 mm	1032		% CP = P/R																																																																																																																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">FINE GRADE / MECHANICAL ANALYSIS</th> </tr> <tr> <td>Dry Wt (g)</td> <td>0 100 83</td> </tr> <tr> <td>2.36 mm</td> <td>25 5 95 79</td> </tr> <tr> <td>1.18 mm</td> <td>54 11 89 74</td> </tr> <tr> <td>600 µm</td> <td>103 21 79 66</td> </tr> <tr> <td>300 µm</td> <td>168 34 66 55</td> </tr> <tr> <td>150 µm</td> <td>238 48 52 43</td> </tr> <tr> <td>75 µm</td> <td>308 61 39 32</td> </tr> <tr> <td>MECH. / HYDRO.</td> <td>R Corr. C.R. Mat In Comb % In Sus</td> </tr> <tr> <td>1hr.</td> <td>5M</td> </tr> <tr> <td>24hr.</td> <td>1M</td> </tr> </table>		FINE GRADE / MECHANICAL ANALYSIS		Dry Wt (g)	0 100 83	2.36 mm	25 5 95 79	1.18 mm	54 11 89 74	600 µm	103 21 79 66	300 µm	168 34 66 55	150 µm	238 48 52 43	75 µm	308 61 39 32	MECH. / HYDRO.	R Corr. C.R. Mat In Comb % In Sus	1hr.	5M	24hr.	1M	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">R-VALUE</th> <th colspan="2">MOISTURE CONTENT</th> <th colspan="2">PLASTICITY INDEX</th> </tr> <tr> <td>RESULT</td> <td>15</td> <td>Gr. Wet</td> <td>L.L.</td> <td>22</td> <td></td> </tr> <tr> <td>SP. G. FINE (SSD)</td> <td></td> <td>Gr. Dry</td> <td>P.L.</td> <td>18</td> <td></td> </tr> <tr> <td>(B) S.S. Dry</td> <td></td> <td>H2O</td> <td>P.I.</td> <td>4</td> <td></td> </tr> <tr> <td>(A) Ov. Dry</td> <td></td> <td>Tare</td> <td></td> <td></td> <td></td> </tr> <tr> <td>ABS. %</td> <td></td> <td>Net Dry</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Wt. S+C+H2O</td> <td></td> <td>% H2O</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Wt. S+C</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>W=Wt. H2O</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Bulk = $\frac{500}{500 - W}$</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SP. GR. COARSE CT206/CT209, +4</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(B) S.S. Dry</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(A) Ov. Dry</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>ABS. %</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>(C) Wt. S. in H2O</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>App = $\frac{A}{A - C}$</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SSD = $\frac{B}{B - C}$</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>OD = $\frac{A}{B - C}$</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>		R-VALUE		MOISTURE CONTENT		PLASTICITY INDEX		RESULT	15	Gr. Wet	L.L.	22		SP. G. FINE (SSD)		Gr. Dry	P.L.	18		(B) S.S. Dry		H2O	P.I.	4		(A) Ov. Dry		Tare				ABS. %		Net Dry				Wt. S+C+H2O		% H2O				Wt. S+C						W=Wt. H2O						Bulk = $\frac{500}{500 - W}$						SP. GR. COARSE CT206/CT209, +4						(B) S.S. Dry						(A) Ov. Dry						ABS. %						(C) Wt. S. in H2O						App = $\frac{A}{A - C}$						SSD = $\frac{B}{B - C}$						OD = $\frac{A}{B - C}$													
FINE GRADE / MECHANICAL ANALYSIS																																																																																																																																													
Dry Wt (g)	0 100 83																																																																																																																																												
2.36 mm	25 5 95 79																																																																																																																																												
1.18 mm	54 11 89 74																																																																																																																																												
600 µm	103 21 79 66																																																																																																																																												
300 µm	168 34 66 55																																																																																																																																												
150 µm	238 48 52 43																																																																																																																																												
75 µm	308 61 39 32																																																																																																																																												
MECH. / HYDRO.	R Corr. C.R. Mat In Comb % In Sus																																																																																																																																												
1hr.	5M																																																																																																																																												
24hr.	1M																																																																																																																																												
R-VALUE		MOISTURE CONTENT		PLASTICITY INDEX																																																																																																																																									
RESULT	15	Gr. Wet	L.L.	22																																																																																																																																									
SP. G. FINE (SSD)		Gr. Dry	P.L.	18																																																																																																																																									
(B) S.S. Dry		H2O	P.I.	4																																																																																																																																									
(A) Ov. Dry		Tare																																																																																																																																											
ABS. %		Net Dry																																																																																																																																											
Wt. S+C+H2O		% H2O																																																																																																																																											
Wt. S+C																																																																																																																																													
W=Wt. H2O																																																																																																																																													
Bulk = $\frac{500}{500 - W}$																																																																																																																																													
SP. GR. COARSE CT206/CT209, +4																																																																																																																																													
(B) S.S. Dry																																																																																																																																													
(A) Ov. Dry																																																																																																																																													
ABS. %																																																																																																																																													
(C) Wt. S. in H2O																																																																																																																																													
App = $\frac{A}{A - C}$																																																																																																																																													
SSD = $\frac{B}{B - C}$																																																																																																																																													
OD = $\frac{A}{B - C}$																																																																																																																																													
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">SAND EQUIVALENT</th> </tr> <tr> <td>Sand R2</td> <td>1.8 1.8</td> </tr> <tr> <td>Clay R1</td> <td>12.7 12.8</td> </tr> <tr> <td>S.E. Value</td> <td>15 15</td> </tr> <tr> <td>L.A.R.T.</td> <td>Rev. Wt. Wt. Ret. % Ret. % Loss</td> </tr> <tr> <td>A B</td> <td>100 5000g</td> </tr> <tr> <td>C D</td> <td>500 5000g</td> </tr> <tr> <td>No. of spheres =</td> <td>Wt. of spheres =</td> </tr> <tr> <td>Dura-Coarse</td> <td>Sed Ht =</td> </tr> <tr> <td>Dura-Fine</td> <td>R2/R1 =</td> </tr> </table>		SAND EQUIVALENT		Sand R2	1.8 1.8	Clay R1	12.7 12.8	S.E. Value	15 15	L.A.R.T.	Rev. Wt. Wt. Ret. % Ret. % Loss	A B	100 5000g	C D	500 5000g	No. of spheres =	Wt. of spheres =	Dura-Coarse	Sed Ht =	Dura-Fine	R2/R1 =	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">pH / RESISTIVITY</th> </tr> <tr> <td>Field</td> <td>Lab.</td> </tr> <tr> <td>Soil pH</td> <td>8.73</td> </tr> <tr> <td>H2O</td> <td>5.70</td> </tr> <tr> <td>Min. Resistivity</td> <td>3075</td> </tr> <tr> <td>Based on 18 gauge CMP.</td> <td></td> </tr> <tr> <td>Estimated life:</td> <td>40 yrs.</td> </tr> <tr> <th colspan="2">CLEANNESS VALUE</th> </tr> <tr> <td>NL</td> <td>SED. HT. RESULT</td> </tr> <tr> <td>FILM STRIPPING</td> <td>ORGANIC IMPURITIES</td> </tr> <tr> <td>NM</td> <td>Satisfactory</td> </tr> <tr> <td></td> <td>Unsatisfactory</td> </tr> </table>		pH / RESISTIVITY		Field	Lab.	Soil pH	8.73	H2O	5.70	Min. Resistivity	3075	Based on 18 gauge CMP.		Estimated life:	40 yrs.	CLEANNESS VALUE		NL	SED. HT. RESULT	FILM STRIPPING	ORGANIC IMPURITIES	NM	Satisfactory		Unsatisfactory																																																																																														
SAND EQUIVALENT																																																																																																																																													
Sand R2	1.8 1.8																																																																																																																																												
Clay R1	12.7 12.8																																																																																																																																												
S.E. Value	15 15																																																																																																																																												
L.A.R.T.	Rev. Wt. Wt. Ret. % Ret. % Loss																																																																																																																																												
A B	100 5000g																																																																																																																																												
C D	500 5000g																																																																																																																																												
No. of spheres =	Wt. of spheres =																																																																																																																																												
Dura-Coarse	Sed Ht =																																																																																																																																												
Dura-Fine	R2/R1 =																																																																																																																																												
pH / RESISTIVITY																																																																																																																																													
Field	Lab.																																																																																																																																												
Soil pH	8.73																																																																																																																																												
H2O	5.70																																																																																																																																												
Min. Resistivity	3075																																																																																																																																												
Based on 18 gauge CMP.																																																																																																																																													
Estimated life:	40 yrs.																																																																																																																																												
CLEANNESS VALUE																																																																																																																																													
NL	SED. HT. RESULT																																																																																																																																												
FILM STRIPPING	ORGANIC IMPURITIES																																																																																																																																												
NM	Satisfactory																																																																																																																																												
	Unsatisfactory																																																																																																																																												
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">TEST(S) REQUESTED</th> <th colspan="2">SAMPLE TYPE</th> </tr> <tr> <td>■ Fine Grade</td> <td>202</td> <td>✓ A.B.</td> <td>PCC</td> </tr> <tr> <td>■ Coarse Grade</td> <td>202</td> <td>✓ A.S.</td> <td>Bk Fill</td> </tr> <tr> <td>■ Filler Material</td> <td>202</td> <td>EMB</td> <td>MISC.</td> </tr> <tr> <td>■ Mech. Analysis</td> <td>203</td> <td>O.G.</td> <td>Sub-Grade</td> </tr> <tr> <td>■ Plasticity Index</td> <td>204</td> <td>✓ A.C. Agg.</td> <td>SOIL</td> </tr> <tr> <td>% Crushed Particles</td> <td>205</td> <td></td> <td>TL-101 S1.C. NO</td> </tr> <tr> <td>SpG. Coarse</td> <td>206</td> <td></td> <td></td> </tr> <tr> <td>SpG. Fine (SSH)</td> <td>207</td> <td></td> <td></td> </tr> <tr> <td>SpG. of Soils</td> <td>209</td> <td></td> <td>Expansion Index</td> </tr> <tr> <td>L.A.R.T.</td> <td>211</td> <td></td> <td>8.0</td> </tr> <tr> <td>Unit Wt.</td> <td>212</td> <td></td> <td>Very Low</td> </tr> <tr> <td>Organic Impurities</td> <td>213</td> <td></td> <td></td> </tr> <tr> <td>Soundness</td> <td>214</td> <td></td> <td></td> </tr> <tr> <td>Relative Compaction</td> <td>216</td> <td></td> <td>Dry Density</td> </tr> <tr> <td>■ Sand Equivalent</td> <td>217</td> <td>✓</td> <td>123.00 pcf</td> </tr> <tr> <td>Moisture Content</td> <td>226</td> <td></td> <td></td> </tr> <tr> <td>Cleaness Value</td> <td>227</td> <td></td> <td></td> </tr> <tr> <td>Durability Fine</td> <td>229</td> <td></td> <td>Max. Dry Density (pcf)</td> </tr> <tr> <td>Durability Coarse</td> <td>229</td> <td></td> <td>Opt. Moist Content (%)</td> </tr> <tr> <td>Flat & Elongated</td> <td>ASTM D 4791</td> <td></td> <td>Laboratory Remarks:</td> </tr> <tr> <td>■ R-Value</td> <td>301</td> <td>✓</td> <td></td> </tr> <tr> <td>Fine Agg Angularity</td> <td>AASHTO T 304</td> <td></td> <td></td> </tr> <tr> <td>Mortar Strength</td> <td>515</td> <td></td> <td></td> </tr> <tr> <td>pH (RC)</td> <td>532</td> <td></td> <td></td> </tr> <tr> <td>Resistivity (RC)</td> <td>532</td> <td></td> <td></td> </tr> <tr> <td>■ pH (CMP)</td> <td>643</td> <td>✓</td> <td></td> </tr> <tr> <td>■ Resistivity (CMP)</td> <td>643</td> <td>✓</td> <td></td> </tr> <tr> <td>■ Expansion Index</td> <td>UBC-29-2</td> <td>✓</td> <td></td> </tr> <tr> <td>Max. Dry Density/</td> <td>ASTM-D1537</td> <td></td> <td></td> </tr> <tr> <td>Opt. Moist Content</td> <td></td> <td></td> <td></td> </tr> </table>		TEST(S) REQUESTED		SAMPLE TYPE		■ Fine Grade	202	✓ A.B.	PCC	■ Coarse Grade	202	✓ A.S.	Bk Fill	■ Filler Material	202	EMB	MISC.	■ Mech. Analysis	203	O.G.	Sub-Grade	■ Plasticity Index	204	✓ A.C. Agg.	SOIL	% Crushed Particles	205		TL-101 S1.C. NO	SpG. Coarse	206			SpG. Fine (SSH)	207			SpG. of Soils	209		Expansion Index	L.A.R.T.	211		8.0	Unit Wt.	212		Very Low	Organic Impurities	213			Soundness	214			Relative Compaction	216		Dry Density	■ Sand Equivalent	217	✓	123.00 pcf	Moisture Content	226			Cleaness Value	227			Durability Fine	229		Max. Dry Density (pcf)	Durability Coarse	229		Opt. Moist Content (%)	Flat & Elongated	ASTM D 4791		Laboratory Remarks:	■ R-Value	301	✓		Fine Agg Angularity	AASHTO T 304			Mortar Strength	515			pH (RC)	532			Resistivity (RC)	532			■ pH (CMP)	643	✓		■ Resistivity (CMP)	643	✓		■ Expansion Index	UBC-29-2	✓		Max. Dry Density/	ASTM-D1537			Opt. Moist Content				<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">SPECIFIC GRAVITY OF SOILS</th> </tr> <tr> <td>Wt Oven Dry Soil (Wo)</td> <td></td> </tr> <tr> <td>Wt Pycnometer + H₂O (Wa)</td> <td></td> </tr> <tr> <td>Wt Pycnometer + H₂O + Soil (Wb)</td> <td></td> </tr> <tr> <td>Wo / (Wo + Wa - Wb)</td> <td></td> </tr> <tr> <td>Spec. Grav.</td> <td></td> </tr> <tr> <td>Wb</td> <td></td> </tr> </table>		SPECIFIC GRAVITY OF SOILS		Wt Oven Dry Soil (Wo)		Wt Pycnometer + H ₂ O (Wa)		Wt Pycnometer + H ₂ O + Soil (Wb)		Wo / (Wo + Wa - Wb)		Spec. Grav.		Wb	
TEST(S) REQUESTED		SAMPLE TYPE																																																																																																																																											
■ Fine Grade	202	✓ A.B.	PCC																																																																																																																																										
■ Coarse Grade	202	✓ A.S.	Bk Fill																																																																																																																																										
■ Filler Material	202	EMB	MISC.																																																																																																																																										
■ Mech. Analysis	203	O.G.	Sub-Grade																																																																																																																																										
■ Plasticity Index	204	✓ A.C. Agg.	SOIL																																																																																																																																										
% Crushed Particles	205		TL-101 S1.C. NO																																																																																																																																										
SpG. Coarse	206																																																																																																																																												
SpG. Fine (SSH)	207																																																																																																																																												
SpG. of Soils	209		Expansion Index																																																																																																																																										
L.A.R.T.	211		8.0																																																																																																																																										
Unit Wt.	212		Very Low																																																																																																																																										
Organic Impurities	213																																																																																																																																												
Soundness	214																																																																																																																																												
Relative Compaction	216		Dry Density																																																																																																																																										
■ Sand Equivalent	217	✓	123.00 pcf																																																																																																																																										
Moisture Content	226																																																																																																																																												
Cleaness Value	227																																																																																																																																												
Durability Fine	229		Max. Dry Density (pcf)																																																																																																																																										
Durability Coarse	229		Opt. Moist Content (%)																																																																																																																																										
Flat & Elongated	ASTM D 4791		Laboratory Remarks:																																																																																																																																										
■ R-Value	301	✓																																																																																																																																											
Fine Agg Angularity	AASHTO T 304																																																																																																																																												
Mortar Strength	515																																																																																																																																												
pH (RC)	532																																																																																																																																												
Resistivity (RC)	532																																																																																																																																												
■ pH (CMP)	643	✓																																																																																																																																											
■ Resistivity (CMP)	643	✓																																																																																																																																											
■ Expansion Index	UBC-29-2	✓																																																																																																																																											
Max. Dry Density/	ASTM-D1537																																																																																																																																												
Opt. Moist Content																																																																																																																																													
SPECIFIC GRAVITY OF SOILS																																																																																																																																													
Wt Oven Dry Soil (Wo)																																																																																																																																													
Wt Pycnometer + H ₂ O (Wa)																																																																																																																																													
Wt Pycnometer + H ₂ O + Soil (Wb)																																																																																																																																													
Wo / (Wo + Wa - Wb)																																																																																																																																													
Spec. Grav.																																																																																																																																													
Wb																																																																																																																																													
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">DURABILITY INDEX</th> </tr> <tr> <td>Dura-Coarse</td> <td>Sed Ht =</td> </tr> <tr> <td>Dura-Fine</td> <td>R2/R1 =</td> </tr> </table>		DURABILITY INDEX		Dura-Coarse	Sed Ht =	Dura-Fine	R2/R1 =	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">CONTRACT NO.</th> </tr> <tr> <td>1</td> <td>2</td> </tr> <tr> <td>0</td> <td>3</td> </tr> <tr> <td>M</td> <td>3</td> </tr> <tr> <td>5</td> <td>0</td> </tr> <tr> <td>1</td> <td>1</td> </tr> <tr> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>2</td> </tr> <tr> <td>0</td> <td>3</td> </tr> <tr> <td>5</td> <td>0</td> </tr> <tr> <td>1</td> <td>1</td> </tr> <tr> <td>9</td> <td>9</td> </tr> <tr> <td colspan="2">LAB. NO.</td> </tr> <tr> <td colspan="2">B</td> </tr> </table>		CONTRACT NO.		1	2	0	3	M	3	5	0	1	1	0	1	1	2	0	3	5	0	1	1	9	9	LAB. NO.		B																																																																																																									
DURABILITY INDEX																																																																																																																																													
Dura-Coarse	Sed Ht =																																																																																																																																												
Dura-Fine	R2/R1 =																																																																																																																																												
CONTRACT NO.																																																																																																																																													
1	2																																																																																																																																												
0	3																																																																																																																																												
M	3																																																																																																																																												
5	0																																																																																																																																												
1	1																																																																																																																																												
0	1																																																																																																																																												
1	2																																																																																																																																												
0	3																																																																																																																																												
5	0																																																																																																																																												
1	1																																																																																																																																												
9	9																																																																																																																																												
LAB. NO.																																																																																																																																													
B																																																																																																																																													
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">DATE</th> </tr> <tr> <td>DATE RCVD:</td> <td>6/11/15</td> </tr> <tr> <td>NUMBER OF CONTAINERS:</td> <td>1 Bag</td> </tr> <tr> <td>NORMAL</td> <td>PRIORITY</td> </tr> <tr> <td></td> <td>DATE NEEDED:</td> </tr> </table>		DATE		DATE RCVD:	6/11/15	NUMBER OF CONTAINERS:	1 Bag	NORMAL	PRIORITY		DATE NEEDED:	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">DATE</th> </tr> <tr> <td>DATE RCVD:</td> <td>7/3/15</td> </tr> <tr> <td>NUMBER OF CONTAINERS:</td> <td>1 Bag</td> </tr> <tr> <td>NORMAL</td> <td>PRIORITY</td> </tr> <tr> <td></td> <td>DATE NEEDED:</td> </tr> </table>		DATE		DATE RCVD:	7/3/15	NUMBER OF CONTAINERS:	1 Bag	NORMAL	PRIORITY		DATE NEEDED:																																																																																																																						
DATE																																																																																																																																													
DATE RCVD:	6/11/15																																																																																																																																												
NUMBER OF CONTAINERS:	1 Bag																																																																																																																																												
NORMAL	PRIORITY																																																																																																																																												
	DATE NEEDED:																																																																																																																																												
DATE																																																																																																																																													
DATE RCVD:	7/3/15																																																																																																																																												
NUMBER OF CONTAINERS:	1 Bag																																																																																																																																												
NORMAL	PRIORITY																																																																																																																																												
	DATE NEEDED:																																																																																																																																												
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">CONTRACT NO.</th> </tr> <tr> <td>1</td> <td>2</td> </tr> <tr> <td>0</td> <td>3</td> </tr> <tr> <td>M</td> <td>3</td> </tr> <tr> <td>5</td> <td>0</td> </tr> <tr> <td>1</td> <td>1</td> </tr> <tr> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>2</td> </tr> <tr> <td>0</td> <td>3</td> </tr> <tr> <td>5</td> <td>0</td> </tr> <tr> <td>1</td> <td>1</td> </tr> <tr> <td>9</td> <td>9</td> </tr> <tr> <td colspan="2">LAB. NO.</td> </tr> <tr> <td colspan="2">B</td> </tr> </table>		CONTRACT NO.		1	2	0	3	M	3	5	0	1	1	0	1	1	2	0	3	5	0	1	1	9	9	LAB. NO.		B		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th colspan="2">CONTRACT NO.</th> </tr> <tr> <td>1</td> <td>2</td> </tr> <tr> <td>0</td> <td>3</td> </tr> <tr> <td>M</td> <td>3</td> </tr> <tr> <td>5</td> <td>0</td> </tr> <tr> <td>1</td> <td>1</td> </tr> <tr> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>2</td> </tr> <tr> <td>0</td> <td>3</td> </tr> <tr> <td>5</td> <td>0</td> </tr> <tr> <td>1</td> <td>1</td> </tr> <tr> <td>9</td> <td>9</td> </tr> <tr> <td colspan="2">LAB. NO.</td> </tr> <tr> <td colspan="2">B</td> </tr> </table>		CONTRACT NO.		1	2	0	3	M	3	5	0	1	1	0	1	1	2	0	3	5	0	1	1	9	9	LAB. NO.		B																																																																																			
CONTRACT NO.																																																																																																																																													
1	2																																																																																																																																												
0	3																																																																																																																																												
M	3																																																																																																																																												
5	0																																																																																																																																												
1	1																																																																																																																																												
0	1																																																																																																																																												
1	2																																																																																																																																												
0	3																																																																																																																																												
5	0																																																																																																																																												
1	1																																																																																																																																												
9	9																																																																																																																																												
LAB. NO.																																																																																																																																													
B																																																																																																																																													
CONTRACT NO.																																																																																																																																													
1	2																																																																																																																																												
0	3																																																																																																																																												
M	3																																																																																																																																												
5	0																																																																																																																																												
1	1																																																																																																																																												
0	1																																																																																																																																												
1	2																																																																																																																																												
0	3																																																																																																																																												
5	0																																																																																																																																												
1	1																																																																																																																																												
9	9																																																																																																																																												
LAB. NO.																																																																																																																																													
B																																																																																																																																													

SRL SOIL & AGGREGATE TESTS

Sample of: Subsurface Soils from Boring MB-7		SRL Lab. Stamp	
Sampled from: 0-5' below the surface		By _____ for _____	
Material Source: Rt Shld of I-405 south @ Sta 300		D. OZOWARA	
Owner / Mfr.: Calltrans		SRL Materials Engineer	
Date Sampled: 6/8/15		SOUTHERN REGIONAL LABORATORY	
Address: Caltrans-Dist. 12		13970 Victoria Street	
Phone No.: (949) 756-4927		Fontana, CA 92336	
Fax No.: (949) 724-2519		Phone: (909) 350 9039	
		Fax: (909) 829 6294	

GRADING ANALYSIS			
Total Wt.	Size (mm)	By: Acc. Wt. Ret. % Ret. % Pass % Pass	Date: Comb. % Pass % Pass
0	75	0	100
76	37.5	76	99
27	25	103	99
226	19	329	98
750	12.5	1079	93
477	9.5	1556	90
925	4.75	2481	83
12351		14832	

FINE GRADE / MECHANICAL ANALYSIS			
Dry Wt. (g)	3.0 mm	75 µm	Comb. % In Sie.
515.0	39	83	
	82	76	
	140	70	
	215	61	
	289	48	
	345	37	
		27	

SAND EQUIVALENT			
Sand R2	Clay R1	S.E. Value	% Loss
2.1	12.8	17	17
2.1	12.6	17	
17			
100			
500			

MECH. / HYDRO.			
Thr.	5M	1M	Mat. In Sie. % In Sie.

SPECIFIC GRAVITY OF SOILS			
Wt Oven Dry Soil (Wo)	Wt Pycnometer + H2O (Wa)	Wt Pycnometer + H2O + Soil (Wb)	Wb / (Wo + Wa - Wb)

DURABILITY INDEX			
Dura-Course	Dura-Fine	Sed.Ht. = R2/R1 =	Wt. of spheres =

TEST(S) REQUESTED			
TEST(S) REQUESTED	A.B.	SAMPLE TYPE	DATE
■ Fine Grade	202	✓	7/3/15
■ Coarse Grade	202	✓	
■ Filler Material	202	✓	
■ Mech. Analysis	203	✓	
■ Plasticity Index	204	✓	
■ % Crushed Particles	205	✓	
■ Sp.G. Coarse	206	✓	
■ Sp.G. Fine (SSD)	207	✓	
■ Sp.G. of Soils	209	✓	
■ L.A.R.T.	211	✓	
■ Unit Wt.	212	✓	
■ Organic Impurities	213	✓	
■ Soundness	214	✓	
■ Relative Compaction	216	✓	
■ Sand Equivalent	217	✓	
■ Moisture Content	226	✓	
■ Cleaness Value	227	✓	
■ Durability Fine	229	✓	
■ Flat & Elongated	ASTM D 4791	✓	
■ R-Value	301	✓	
■ Fine Agg Angularity	AASHTO T 304	✓	
■ Mortar Strength	515	✓	
■ pH (RC)	532	✓	
■ Resistivity (RC)	532	✓	
■ pH (CMP)	643	✓	
■ Resistivity (CMP)	643	✓	
■ Expansion Index	UBC-29-2	✓	
■ Max. Dry Density / Opt. Moist Content	ASTM-D1557	✓	

CONTRACT NO.			
1	2	3	4
0	M	3	5
0	1		

LAB. NO.			
1	2	3	4
1	2	0	M
3	5	0	1

DATE			
DATE RCVD:	CONTRACT NO.	DATE OUT:	LAB. NO.
6/11/15	1	7/3/15	5120B

CONTAINERS:			
NORMAL	PRIORITY	DATE NEEDED:	OTHER
1 Bag	✓		

EXPANSION INDEX			
Unit Wt.	Moisture Content	Expansion Index	Soil
7.0	114.50	pcf	SOIL

SPECIFIC GRAVITY OF SOILS			
Wt Oven Dry Soil (Wo)	Wt Pycnometer + H2O (Wa)	Wt Pycnometer + H2O + Soil (Wb)	Wb / (Wo + Wa - Wb)

DURABILITY INDEX			
Dura-Course	Dura-Fine	Sed.Ht. = R2/R1 =	Wt. of spheres =

SRL SOIL & AGGREGATE TESTS

Sample of: Subsurface Soils from Boring MB-8		SRL Lab. Stamp	
Sampled from: 0-5' below the surface		By _____ for _____	
Material Source: Rt Shld of I-405 south @ Sta 290		D. OZOWARA	
Owner / Mfr.: Calltrans		SRL Materials Engineer	
Date Sampled: 6/8/15		SOUTHERN REGIONAL LABORATORY	
Address: Calltrans-Dist. 12		13970 Victoria Street	
Phone No.: (949) 756-4927		Fontana, CA 92336	
Fax No.: (949) 724-2519		Phone: (909) 350 9039	
		Fax: (909) 829 6294	
GRADING ANALYSIS		SPEC.	
Total Wt.	13517 g	Date: _____	
By:	Acc. Comb. % Pass	% Pass	
Size (mm)	Wt. Ret.	Wt. Ret.	
0	50	100	
102	37.5	99	
40	25	99	
184	19	98	
394	12.5	95	
429	9.5	91	
793	4.75	86	
11575	13517		
FINE GRADE / MECHANICAL ANALYSIS			
Dry Wt. (g)	2.36 mm	0	100
	1.18 mm	8	92
	600 µm	17	83
	300 µm	29	71
	150 µm	47	53
	75 µm	65	30
		76	24
			21
MECH. / HYDRO. R Corr. C.R. Mai In % In Sus Comb % In Sus			
1-lb.	5M		
2-lb.	1M		
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value	20	21	21
% SPEC.			
L.A.R.T.	Rev.	Wt. Ret.	% Loss
A	100	5000g	
C	500	5000g	
No. of spheres = _____ Wt. of spheres = _____			
DURABILITY INDEX			
Dura-Coarse	Sed Ht. =		
Dura-Fine	R2/R1 =		
SPEC.			
MIN. SPEC.			
SAND EQUIVALENT			
Sand R2	2.4	2.6	Avg.
Clay R1	12.6	12.8	
S.E. Value</			

SRL SOIL & AGGREGATE TESTS

Sample of: Subsurface Soils from Boring MB-9 Sampled from: 0-5' below the surface Material Source: Lt Median Shld of I-405 south @ Sta 290 Owner / Mfr.: Caltrans		SRL Lab. Stamp By: _____ for D. OZOWARA SRL Materials Engineer	
Date Sampled: 6/10/15 GRADING ANALYSIS Total Wt. 11104 g By: _____ Date: _____ Size (mm) Acc. Wt. Ret. % Ret. % Pass % Pass % Pass 0 25 0 100 43 19 43 0 100 470 12.5 513 5 95 260 9.5 773 7 93 498 4.75 1271 11 89 9833 11104		R.E.: Mehرداد Mahdavian Address: Caltrans-Dist. 12 Southern Regional Laboratory 13970 Victoria Street Fontana, CA 92336 Phone: (909) 350 9039 Fax: (909) 829 6294	
FINE GRADE / MECHANICAL ANALYSIS Dry Wt. (g) 0 100 89 2.36 mm 13 2 98 87 1.18 mm 27 5 95 85 600 µm 59 11 89 79 300 µm 116 22 78 69 150 µm 224 43 57 51 75 µm 312 59 41 36.0 MECH. / HYDRO. R Corr. C.R. Mat In Comb % In Sus % In Sus		% CRUSHED PARTICLES SPEC. % Ret. x (Wt. Cr./Tot. Wt.) = Prod. Wtd. Avg. % CP Ret. No. 4 = % CP = P/R	
SAND EQUIVALENT Sand R2 9.0 8.0 Avg. Clay R1 136.0 130.0 S.E. Value 7 7 L.A.R.T. Rev. Wt. Wt. Ret. % Ret. % Loss % SPEC. A B 100 500g C D 500 500g No. of spheres = Wt. of spheres =		MOISTURE CONTENT SPEC. PLASTICITY INDEX Gr. Wet L.L. 27 Gr. Dry P.L. 17 H2O P.I. 10 Tare Net Dry % H2O pH / RESISTIVITY Soil pH Field Lab. 8.73 H2O Min. Resistivity 5.70 Based on 18 gauge CMP. Estimated life: 31 yrs.	
DURABILITY INDEX Dura-Coarse Sed Ht. = Dura-Fine R2/R1 =		R-VALUE BATCH SPEC. % Run Size Wt. 100 25 mm 1200 95 19 mm 1140 93 9.5 mm 1116 89 4.75 mm 1068 R-VALUE SPEC. RESULT 9 SP. G. FINE (SSD) (B) S.S. Dry (A) Ov. Dry ABS. % Wt. S+C+H2O Wt. S+C W-Wt. H2O Bulk = 500 - W = SP. GR. COARSE CT206/CT209, +4 (B) S.S. Dry (A) Ov. Dry ABS. % (C) Wt. S. in H2O App = A / A - C = SSD = B / B - C = OD = A / B - C =	
TEST(S) REQUESTED <input checked="" type="checkbox"/> Fine Grade <input checked="" type="checkbox"/> Coarse Grade <input checked="" type="checkbox"/> Filler Material <input checked="" type="checkbox"/> Mech. Analysis <input checked="" type="checkbox"/> Plasticity Index <input checked="" type="checkbox"/> % Crushed Particles <input checked="" type="checkbox"/> SpG. Coarse <input checked="" type="checkbox"/> SpG. Fine (SSU) <input checked="" type="checkbox"/> SpG. of Soils <input checked="" type="checkbox"/> L.A.R.T. <input checked="" type="checkbox"/> Unit Wt. <input checked="" type="checkbox"/> Organic Impurities <input checked="" type="checkbox"/> Soundness <input checked="" type="checkbox"/> Relative Compaction <input checked="" type="checkbox"/> Sand Equivalent <input checked="" type="checkbox"/> Moisture Content <input checked="" type="checkbox"/> Cleaness Value <input checked="" type="checkbox"/> Durability Fine <input checked="" type="checkbox"/> Durability Coarse <input checked="" type="checkbox"/> Flat & Elongated <input checked="" type="checkbox"/> R-Value <input checked="" type="checkbox"/> Fine Age Angularity <input checked="" type="checkbox"/> Mortar Strength <input checked="" type="checkbox"/> pH (RC) <input checked="" type="checkbox"/> Resistivity (RC) <input checked="" type="checkbox"/> pH (CMP) <input checked="" type="checkbox"/> Resistivity (CMP) <input checked="" type="checkbox"/> Expansion Index <input checked="" type="checkbox"/> Max. Dry Density/ <input checked="" type="checkbox"/> Opt. Moist Content		SAMPLE TYPE <input checked="" type="checkbox"/> A B <input checked="" type="checkbox"/> A S <input checked="" type="checkbox"/> BK-Fill <input checked="" type="checkbox"/> EMB <input checked="" type="checkbox"/> O G <input checked="" type="checkbox"/> A.C. Age <input checked="" type="checkbox"/> SOIL TL-101 S.I.C. NO. Expansion Index 25.0 Low Dry Density 113.50 pcf	
CONTRACT NO. 6/11/15 DATE 6/11/15 NUMBER OF CONTAINERS: 1 Bag NORMAL PRIORITY DATE NEEDED:		CONTRACT NO. 1 DATE 6/11/15 NUMBER OF CONTAINERS: 1 Bag NORMAL PRIORITY DATE NEEDED:	
DATE 6/11/15 RCVD: 6/11/15 DATE OUT: 7/7/15 LAB. NO. 5122B		CONTRACT NO. 1 DATE 6/11/15 NUMBER OF CONTAINERS: 1 Bag NORMAL PRIORITY DATE NEEDED:	
SPECIFIC GRAVITY OF SOILS Wt Oven Dry Soil (Wo) Wt Pycnometer + H2O (Wa) Wt Pycnometer + H2O + Soil (Wb) Wo / (Wo + Wa - Wb)		CONTRACT NO. 1 DATE 6/11/15 NUMBER OF CONTAINERS: 1 Bag NORMAL PRIORITY DATE NEEDED:	

07-AGG-SSD (RG)SD 7/93, Rev. HC 10/17/11

SRL SOIL & AGGREGATE TESTS

Sample of: Subsurface Soils from Boring MB-10		SRL Lab. Stamp	
Sampled from: 0-5' below the surface		By _____ for _____	
Material Source: Lt Median Shld of I-405 south @ Sta 260		D. OZOWARA SRL Materials Engineer	
Owner / Mfr.: Caltrans		SOUTHERN REGIONAL LABORATORY 13970 Victoria Street Fontana, CA 92336 Phone: (909) 330 9039 Fax: (909) 829 6294	
Date Sampled: 6/10/15		R.E.: Mehrdad Mahdavian Address: Caltrans-Dist. 12	
GRADING ANALYSIS		R-VALUE BATCH	
Total Wt.	12814 g	By:	Date:
Size (mm)	Acc. Wt. Ret. % Pass	Wt.	Comb. % Pass
87.5		25 mm	100
75		100 19 mm	97
62.5		96 12.5 mm	93
50		92 9.5 mm	89
37.5		77 4.75 mm	75
0			
372			
532			
562			
1680			
9568			
FINE GRADE / MECHANICAL ANALYSIS			
Dry Wt. (g)	0	100	75
2.36 mm	49	10	90
1.18 mm	87	17	83
600 µm	133	27	73
300 µm	187	37	63
150 µm	258	52	48
75 µm	348	70	30
MECH. / HYDRO. R Corr. C.R.			
1hr. 5M			
24hr. 1M			
SAND EQUIVALENT			
Sand R2	2.2	2.1	Avg.
Clay R1	13.9	13.9	
S.E. Value	16	16	16
L.A.R.T. Rev. Wt.	Wt. Ret.	% Ret.	% Loss
A B 100	5000g		
C D 500	5000g		
No. of spheres = Wt. of spheres =			
DURABILITY INDEX			
Dura-Coarse	Sed.Ht.		
Dura-Fine	R2/R1 =		

DATE RCVD: 6/11/15		CONTRACT NO. 6/11/15	
DATE OUT: 7/7/15		SAMPLE NO. MB-10	
NUMBER OF CONTAINERS: 1 Bag		LAB. NO. 5123B	
NORMAL PRIORITY DATE NEEDED: <input checked="" type="checkbox"/>		By: FAX MAIL PHONE OTHER	
TEST(S) REQUESTED		SAMPLE TYPE	
<input checked="" type="checkbox"/> Fine Grade	202	<input checked="" type="checkbox"/> A.B.	PCC
<input checked="" type="checkbox"/> Coarse Grade	202	<input checked="" type="checkbox"/> A.S.	Bk.Fil
<input checked="" type="checkbox"/> Filler Material	202	<input checked="" type="checkbox"/> EMB.	MISC.
<input checked="" type="checkbox"/> Mech. Analysis	203	<input checked="" type="checkbox"/> O.G.	Sub-Grade
<input checked="" type="checkbox"/> Plasticity Index	204	<input checked="" type="checkbox"/> A.C. Agg.	SOIL
<input checked="" type="checkbox"/> % Crushed Particles	205	TL-101 S.I.C. NO.	
<input checked="" type="checkbox"/> Sp.G. Coarse	206	Expansion Index	
<input checked="" type="checkbox"/> Sp.G. Fine (SSD)	207	0.0	
<input checked="" type="checkbox"/> Sp.G. of Soils	209	No Expansion	
<input checked="" type="checkbox"/> L.A.R.T.	211	Dry Density	
<input checked="" type="checkbox"/> Unit Wt.	212	114.40 pcf	
<input checked="" type="checkbox"/> Organic Impurities	213	Max. Dry Density (pcf)	
<input checked="" type="checkbox"/> Soundness	214	Opt. Moist Content (%)	
<input checked="" type="checkbox"/> Relative Compaction	216	Laboratory Remarks:	
<input checked="" type="checkbox"/> Sand Equivalent	217		
<input checked="" type="checkbox"/> Moisture Content	226		
<input checked="" type="checkbox"/> Cleaness Value	227		
<input checked="" type="checkbox"/> Durability Fine	229		
<input checked="" type="checkbox"/> Durability Coarse	229		
<input checked="" type="checkbox"/> Flat & Elongated	ASTM D 4791		
<input checked="" type="checkbox"/> R-Value	301		
<input checked="" type="checkbox"/> Fine Agg Angularity	AASHTO T 304		
<input checked="" type="checkbox"/> Mortar Strength	515		
<input checked="" type="checkbox"/> pH (RC)	532		
<input checked="" type="checkbox"/> Resistivity (RC)	532		
<input checked="" type="checkbox"/> pH (CMP)	643		
<input checked="" type="checkbox"/> Resistivity (CMP)	643		
<input checked="" type="checkbox"/> Expansion Index	UBC-29-2		
<input checked="" type="checkbox"/> Max. Dry Density	ASTM-D1557		
<input checked="" type="checkbox"/> Opt. Moist Content			
SPECIFIC GRAVITY OF SOILS			
Wt Oven Dry Soil (Wo)			
Wt Pycnometer + H ₂ O (Wa)			
Wt Pycnometer + H ₂ O + Soil (Wb)			
Wo / (Wo + Wa - Wb)			
Spec. Grav.			
Unsatisfactory			

DATE RCVD: 6/11/15		CONTRACT NO. 6/11/15	
DATE OUT: 7/7/15		SAMPLE NO. MB-10	
NUMBER OF CONTAINERS: 1 Bag		LAB. NO. 5123B	
NORMAL PRIORITY DATE NEEDED: <input checked="" type="checkbox"/>		By: FAX MAIL PHONE OTHER	
TEST(S) REQUESTED		SAMPLE TYPE	
<input checked="" type="checkbox"/> Fine Grade	202	<input checked="" type="checkbox"/> A.B.	PCC
<input checked="" type="checkbox"/> Coarse Grade	202	<input checked="" type="checkbox"/> A.S.	Bk.Fil
<input checked="" type="checkbox"/> Filler Material	202	<input checked="" type="checkbox"/> EMB.	MISC.
<input checked="" type="checkbox"/> Mech. Analysis	203	<input checked="" type="checkbox"/> O.G.	Sub-Grade
<input checked="" type="checkbox"/> Plasticity Index	204	<input checked="" type="checkbox"/> A.C. Agg.	SOIL
<input checked="" type="checkbox"/> % Crushed Particles	205	TL-101 S.I.C. NO.	
<input checked="" type="checkbox"/> Sp.G. Coarse	206	Expansion Index	
<input checked="" type="checkbox"/> Sp.G. Fine (SSD)	207	0.0	
<input checked="" type="checkbox"/> Sp.G. of Soils	209	No Expansion	
<input checked="" type="checkbox"/> L.A.R.T.	211	Dry Density	
<input checked="" type="checkbox"/> Unit Wt.	212	114.40 pcf	
<input checked="" type="checkbox"/> Organic Impurities	213	Max. Dry Density (pcf)	
<input checked="" type="checkbox"/> Soundness	214	Opt. Moist Content (%)	
<input checked="" type="checkbox"/> Relative Compaction	216	Laboratory Remarks:	
<input checked="" type="checkbox"/> Sand Equivalent	217		
<input checked="" type="checkbox"/> Moisture Content	226		
<input checked="" type="checkbox"/> Cleaness Value	227		
<input checked="" type="checkbox"/> Durability Fine	229		
<input checked="" type="checkbox"/> Durability Coarse	229		
<input checked="" type="checkbox"/> Flat & Elongated	ASTM D 4791		
<input checked="" type="checkbox"/> R-Value	301		
<input checked="" type="checkbox"/> Fine Agg Angularity	AASHTO T 304		
<input checked="" type="checkbox"/> Mortar Strength	515		
<input checked="" type="checkbox"/> pH (RC)	532		
<input checked="" type="checkbox"/> Resistivity (RC)	532		
<input checked="" type="checkbox"/> pH (CMP)	643		
<input checked="" type="checkbox"/> Resistivity (CMP)	643		
<input checked="" type="checkbox"/> Expansion Index	UBC-29-2		
<input checked="" type="checkbox"/> Max. Dry Density	ASTM-D1557		
<input checked="" type="checkbox"/> Opt. Moist Content			
SPECIFIC GRAVITY OF SOILS			
Wt Oven Dry Soil (Wo)			
Wt Pycnometer + H ₂ O (Wa)			
Wt Pycnometer + H ₂ O + Soil (Wb)			
Wo / (Wo + Wa - Wb)			
Spec. Grav.			
Unsatisfactory			

**CORROSION
ANALYSIS
RESULTS**

Department of Transportation
 CalTrans Southern Regional Lab
 13970 Victoria St.
 Fontana, CA 92336

Report Date: 8/27/2015
 Reported By: Matthew Clayton (MREA)

Corrosion Test Summary Report - Soil

Project Number: EA 12-0M3501 Sample By: N/A
 Project Number: EFIS 12 1200 0018 Sample Date: 6/10/2015
 Sample Location: Right Shoulder SB 405 loop on ramp Test Date: 8/27/2015
 from Culver Dr. TL101 #: None

Soil #	Description:	Minimum Resistivity (CT 643)	pH (CT 643)	Chloride Content (CT 422)	Sulfate Content (CT 417)	Corrosive?
SRL 5115B	Boring MB-2, 0'-5'	860 ohm-cm	8.83	31 ppm	211 ppm	no

For structural elements, the Department considers a site to be corrosive if one or more of the following conditions exist : Chloride concentration is 500 ppm or greater, sulfate concentration is 2000 ppm or greater, or the pH is 5.5 or less. Resistivity is not considered for Structural Elements.

For aluminum or aluminized steel culvert pipe, minimum resistivity must be greater than 1500 ohm-cm.

Refer to the Caltrans Corrosion Guidelines and the Caltrans Highway Design Manual for details.

**COPY OF
TRAFFIC
INDEX (TI)
LETTER**

Memorandum

To : **Behdad Baseghi, Chief**
Materials & Research Branch

Date: May 18, 2015

Attn : Mehrdad Mahdavian

File No: 12-ORA-405
PM 2.6 / 6.5
EA: 12-0M3501
PI: 1212000018

From : **DEPARTMENT OF TRANSPORTATION**
District 12, Traffic Studies Branch/District Safety Program

Subject: Traffic Index (TI) Calculation

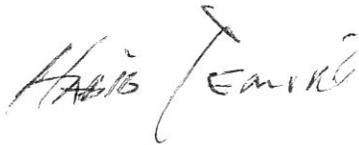
Per your May 8, 2015 request, we have calculated the 20-year and 40-year design mainline TI values for the above listed project as follow:

Route	Postmile	20-Year TI (100%)	40-Year TI (100%)
405	2.6 / 6.5	14.5	15.5

Please be advised that the Growth Factor of 0.38% was provided to us by the Planning Department and Highway Design Manual procedures were used to calculate the above listed TI values.

Should you have any questions, please contact Habib Temori, at (949) 724-2360.

Prepared by:



Habib Temori
Traffic Studies Branch
Route Engineer for Routes 73, 74, 241 & 261
District Safety Device Coordinator

Concurred by:



FOR Jason Osman
Traffic Studies Branch
District Traffic Safety Engineer

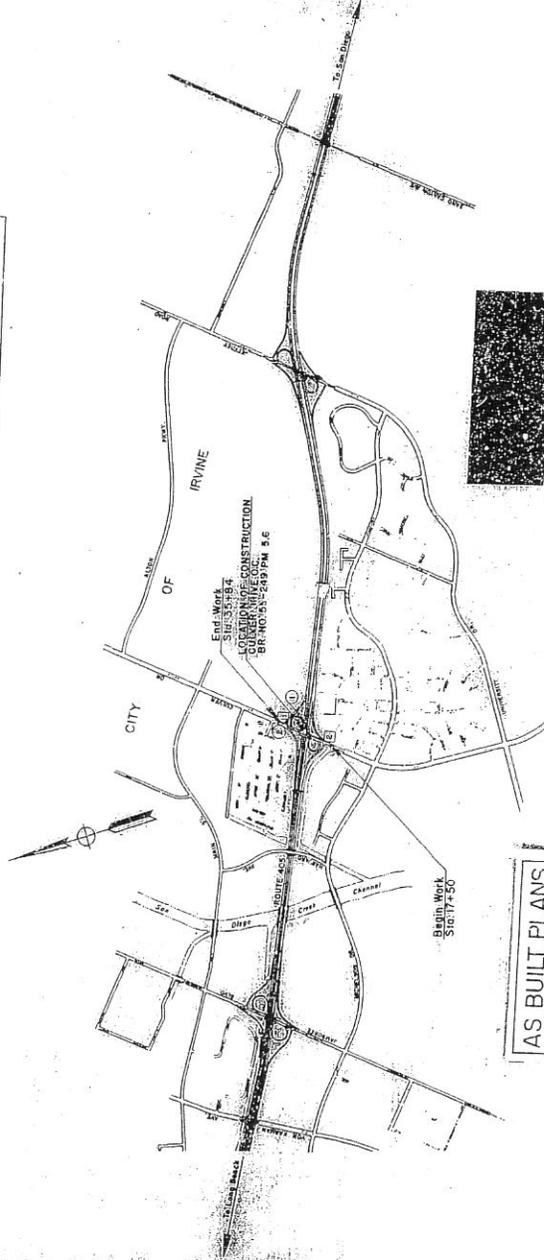
C: File

**COPIES OF
AS-BUILT
PLANS**

PROJECT NO. 705
 DATE 1/1/88
 PROJECT NAME
 DRAWN BY
 CHECKED BY
 APPROVED BY

CONSTRUCTION CONTROL SURVEY DATA

MARKING	ELEVATION	LOCATION AND DESCRIPTION
1	52.64	END OF CONSTRUCTION OF STATION 1+00.00
2	57.12	END OF CONSTRUCTION OF STATION 1+00.00
1	52.64	END OF CONSTRUCTION OF STATION 1+00.00
2	57.12	END OF CONSTRUCTION OF STATION 1+00.00



AS BUILT PLANS
 Contract No. 07-003414
 Date Completed 5-16-88
 Document No.

**CONSTRUCTION STAKING SURVEY
 CONTROL DATA**

ICJ 0710 EA 00341



DATE	BY	REVISION
11/22/84

1-405-2 (107)103

DESIGNED BY
 CHECKED BY
 APPROVED BY

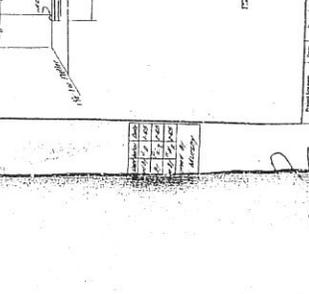
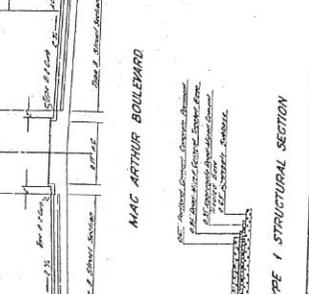
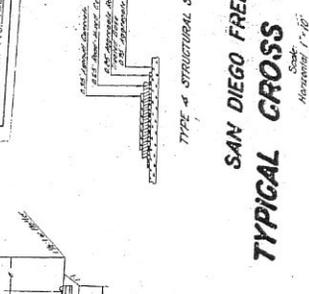
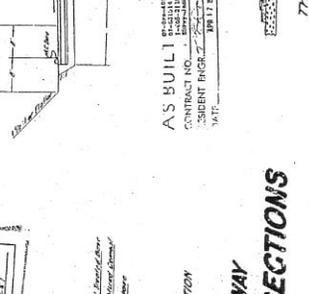
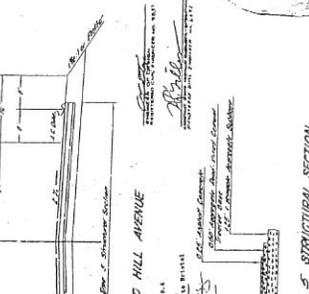
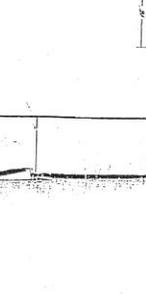
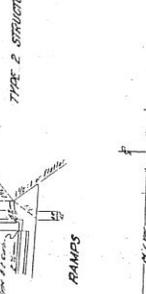
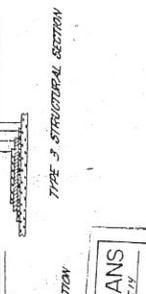
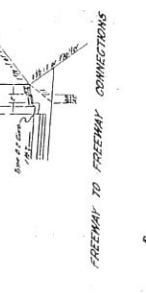
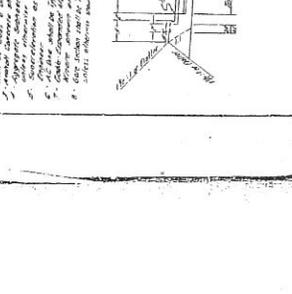
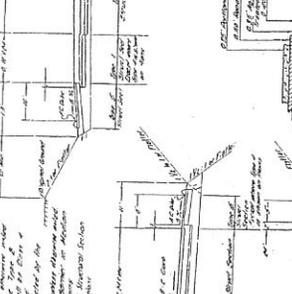
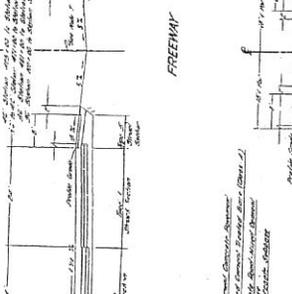
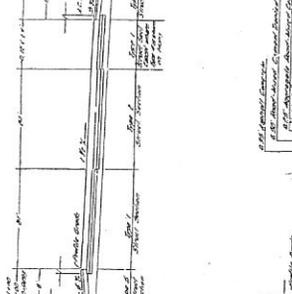
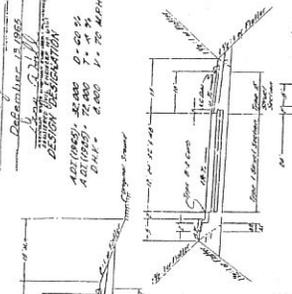
DATE
 SCALE
 SHEET NO.

PROJECT NO.
 CONTRACT NO.

DATE
 SCALE
 SHEET NO.

PROJECT NO.
 CONTRACT NO.

DATE
 SCALE
 SHEET NO.



- NOTES:
1. All dimensions are in feet and inches.
 2. All dimensions are to be maintained unless otherwise noted.
 3. All dimensions are to be maintained unless otherwise noted.
 4. All dimensions are to be maintained unless otherwise noted.
 5. All dimensions are to be maintained unless otherwise noted.
 6. All dimensions are to be maintained unless otherwise noted.
 7. All dimensions are to be maintained unless otherwise noted.
 8. All dimensions are to be maintained unless otherwise noted.
 9. All dimensions are to be maintained unless otherwise noted.
 10. All dimensions are to be maintained unless otherwise noted.

AS BUILT PLANS
 Contract No. 1-405-2
 Date Completed 11/22/84
 Document No. 103

SAN DIEGO FREEWAY
 TYPICAL CROSS SECTIONS

MAC ARTHUR BOULEVARD

RED HILL AVENUE

TYPE 1 STRUCTURAL SECTION

TYPE 4 STRUCTURAL SECTION

TYPE 5 STRUCTURAL SECTION

DATE	BY	REVISION
11/22/84

PROJECT NO.
 CONTRACT NO.

**COPY OF LIFE
CYCLE COST
ANALYSIS
SUMMARY**

Probabilistic Life Cycle Cost Analysis Worksheet

Alternative 1	Mainline and HOV Lane Widening with CR	
Number of Activities	1	
Activity 1	NEW/RECONST CRCP (40YR)	
Agency Construction Cost (\$1000)	\$5,614.00	
User Work Zone Costs (\$1000)		
Work Zone Duration (days)	0	
No of Lanes Open in Each Direction During Work Zone	5	
Activity Service Life (years)	55.0	
Activity Structural Life (years)		
Maintenance Frequency (years)	1	
Agency Maintenance Cost (\$1000)	3.84	
Work Zone Length (miles)	1.00	
Work Zone Speed Limit (mph)	60	
Work Zone Capacity (vphpl)	1510	
Traffic Hourly Distribution	Weekday Double-Peak	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
<i>Inbound</i>	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		
<i>Outbound</i>	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		
Activity 2		
Agency Construction Cost (\$1000)		
User Work Zone Costs (\$1000)		
Work Zone Duration (days)		
No of Lanes Open in Each Direction During Work Zone		
Activity Service Life (years)		
Activity Structural Life (years)		
Maintenance Frequency (years)	1	
Agency Maintenance Cost (\$1000)		
Work Zone Length (miles)		
Work Zone Speed Limit (mph)		
Work Zone Capacity (vphpl)		
Traffic Hourly Distribution	Weekday Double-Peak	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
<i>Inbound</i>	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		
<i>Outbound</i>	Start	End
First period of lane closure		
Second period of lane closure		

Probabilistic Life Cycle Cost Analysis Worksheet

Alternative 2	Mainline Widening and HOV Widening	
Number of Activities	3	
Activity 1	NEW/RECONST JPCP (40YR)	
Agency Construction Cost (\$1000)	\$5,238.00	
User Work Zone Costs (\$1000)		
Work Zone Duration (days)	0	
No of Lanes Open in Each Direction During Work Zone	5	
Activity Service Life (years)	45.0	
Activity Structural Life (years)		
Maintenance Frequency (years)	1	
Agency Maintenance Cost (\$1000)	15.36	
Work Zone Length (miles)	1.00	
Work Zone Speed Limit (mph)	60	
Work Zone Capacity (vphpl)	1510	
Traffic Hourly Distribution	Weekday Double-Peak	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
<i>Inbound</i>	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		
<i>Outbound</i>	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		
Activity 2	CAPM (CPR C)	
Agency Construction Cost (\$1000)	\$51.00	
User Work Zone Costs (\$1000)		
Work Zone Duration (days)	2	
No of Lanes Open in Each Direction During Work Zone	5	
Activity Service Life (years)	5.0	
Activity Structural Life (years)		
Maintenance Frequency (years)	1	
Agency Maintenance Cost (\$1000)	57.6	
Work Zone Length (miles)	1.00	
Work Zone Speed Limit (mph)	60	
Work Zone Capacity (vphpl)	1510	
Traffic Hourly Distribution	Weekday Double-Peak	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
<i>Inbound</i>	Start	End
First period of lane closure	0	5
Second period of lane closure		
Third period of lane closure		
<i>Outbound</i>	Start	End
First period of lane closure	22	24
Second period of lane closure		

Probabilistic Life Cycle Cost Analysis Worksheet

Activity 3	CAPM (CPR B)	
Agency Construction Cost (\$1000)	\$77.00	
User Work Zone Costs (\$1000)		
Work Zone Duration (days)	3	
No of Lanes Open in Each Direction During Work Zone	5	
Activity Service Life (years)	10.0	
Activity Structural Life (years)		
Maintenance Frequency (years)	1	
Agency Maintenance Cost (\$1000)	28.8	
Work Zone Length (miles)	1.00	
Work Zone Speed Limit (mph)	60	
Work Zone Capacity (vphpl)	1510	
Traffic Hourly Distribution	Weekday Double-Peak	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
<i>Inbound</i>	Start	End
First period of lane closure	0	5
Second period of lane closure		
Third period of lane closure		
<i>Outbound</i>	Start	End
First period of lane closure	22	24
Second period of lane closure		
Third period of lane closure		

INPUT WORKSHEET

1. Economic Variables

Value of Time for Passenger Cars (\$/hour)	\$12.80
Value of Time for Single Unit Trucks (\$/hour)	\$31.70
Value of Time for Combination Trucks (\$/hour)	\$31.70

2. Analysis Options

Include User Costs in Analysis	Yes
Include User Cost Remaining Service Life Value	Yes
Use Differential User Costs	Yes
User Cost Computation Method	Calculated
Include Agency Cost Remaining Service Life Value	Yes
Traffic Direction	Both
Analysis Period (Years)	55.00
Beginning of Analysis Period	2017.00
Discount Rate (%)	4.00
Number of Alternatives	2.00

3. Project Details and Quantity Calculations

State Route	I-405
Project Type	New/Reconstruction/Widen
Project Name	SB I-405 Auxiliary Lane and Ramp Improvements, EA 0M3501
Maintenance Service Level	1
Local Region	Orange County
County	Orange/2.6-6.5
Climate Region	South Coast
Analyzed By	MM
Mileposts	
Begin	0.00
End	0.00
Length of Project (miles)	1.60
Comments	This project is proposing to widen the SB I-405 by constructing an Auxiliary lane from Culver Dr. Interchange to University Ave Off-ramp, including shifting the HOV lane into the median in portions of the widening, and partial widening/reconstruction of the Culver Drive ramps

4. Traffic Data

AADT Construction Year (total for both directions)	275,000
Cars as Percentage of AADT (%)	94
Single Unit Trucks as Percentage of AADT (%)	3
Combination Trucks as Percentage of AADT (%)	3
Annual Growth Rate of Traffic (%)	1
Speed Limit Under Normal Operating Conditions (mph)	65

No of Lanes in Each Direction During Normal Conditions	5
Free Flow Capacity (vphpl)	2,170
Queue Dissipation Capacity (vphpl)	1,700
Maximum AADT (total for both directions)	537,730
Maximum Queue Length (miles)	1

5. Maintenance and Rehabilitation Sequence

Alternative 1

Final Pavement Surface

Design Life

Activity 1 Name

Activity 1 Year of Action

Activity 1 Annual Maintenance Cost (\$1000)

Activity 1 Activity Service Life (Year)

Activity 2 Name

Activity 2 Year of Action

Activity 2 Annual Maintenance Cost (\$1000)

Activity 2 Activity Service Life (Year)

Activity 3 Name

Activity 3 Year of Action

Activity 3 Annual Maintenance Cost (\$1000)

Activity 3 Activity Service Life (Year)

Activity 4 Name

Activity 4 Year of Action

Activity 4 Annual Maintenance Cost (\$1000)

Activity 4 Activity Service Life (Year)

Activity 5 Name

Activity 5 Year of Action

Activity 5 Annual Maintenance Cost (\$1000)

Activity 5 Activity Service Life (Year)

Activity 6 Name

Activity 6 Year of Action

Activity 6 Annual Maintenance Cost (\$1000)

Activity 6 Activity Service Life (Year)

Alternative 2

Final Pavement Surface

Design Life

Activity 1 Name

Activity 1 Year of Action

Activity 1 Annual Maintenance Cost (\$1000)

Activity 1 Activity Service Life (Year)

Activity 2 Name

Activity 2 Year of Action

Activity 2 Annual Maintenance Cost (\$1000)

Activity 2 Activity Service Life (Year)

Activity 3 Name

Activity 3 Year of Action

Activity 3 Annual Maintenance Cost (\$1000)

Activity 3 Activity Service Life (Year)

Activity 4 Name

NEW/RECONST
CRCP (40YR)
2017
3
55
2072
0
0
2072
0
0
2072
0
0
2072
0
0
2072
0
0
2072
0
0
2062
48
5
CAPM (CPR B)
2067
24
10

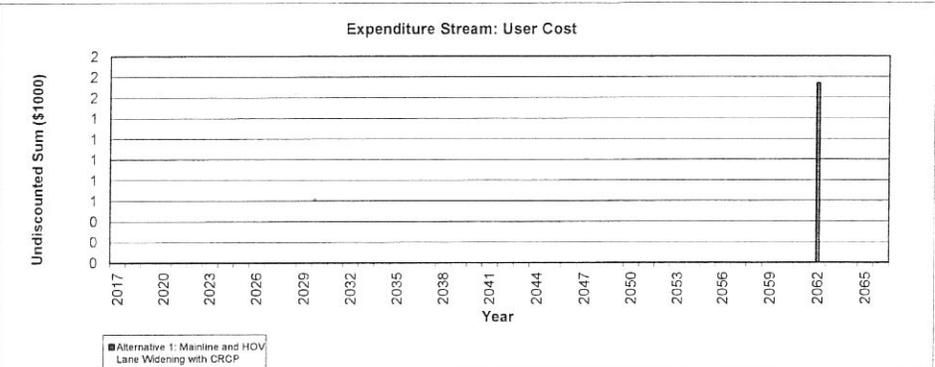
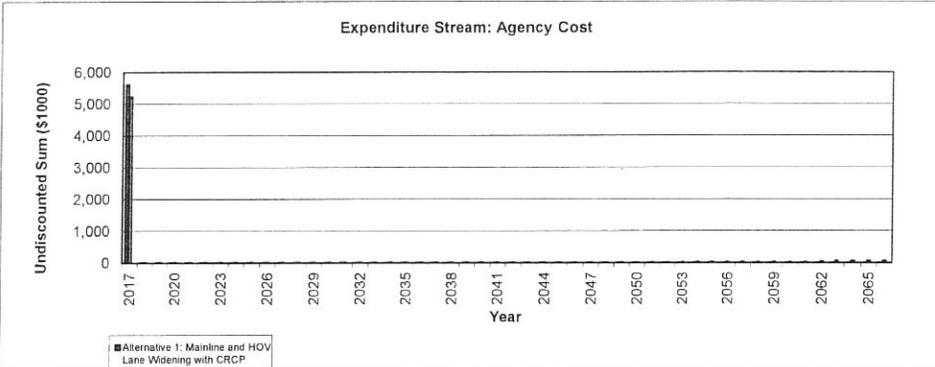
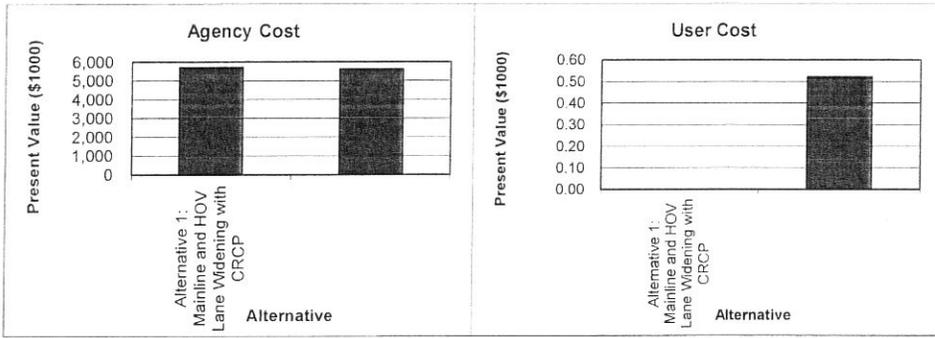
Probabilistic Life Cycle Cost Analysis Worksheet

Update Results

		Total Cost							
Total Cost	Alternative 1: Mainline and HOV Lane Widening with CRCP		Alternative 2: Mainline Widening and HOV Widening using JPCP		Alternative 3:		Alternative 4:		
	Agency Cost (\$1000)	User Cost (\$1000)	Agency Cost (\$1000)	User Cost (\$1000)	Agency Cost (\$1000)	User Cost (\$1000)	Agency Cost (\$1000)	User Cost (\$1000)	
Undiscounted Sum	\$5,821.35	\$0.00	\$6,342.93	\$3.08					
Present Value	\$5,698.45	\$0.00	\$5,618.22	\$0.52					
EUAC	\$257.75	\$0.00	\$254.12	\$0.02					
Lowest Present Value Agency Cost	Alternative 2: Mainline Widening and HOV Widening using JPCP								
Lowest Present Value User Cost	Alternative 1: Mainline and HOV Lane Widening with CRCP								

Year	Expenditure Stream							
	1: Mainline and HOV Lane Widening		Mainline Widening and HOV Widening		Alternative 3:		Alternative 4:	
	Agency Cost (\$1000)	User Cost (\$1000)	Agency Cost (\$1000)	User Cost (\$1000)	Agency Cost (\$1000)	User Cost (\$1000)	Agency Cost (\$1000)	User Cost (\$1000)
2017	\$5,614.00		\$5,238.00					
2018	\$3.84		\$15.36					
2019	\$3.84		\$15.36					
2020	\$3.84		\$15.36					
2021	\$3.84		\$15.36					
2022	\$3.84		\$15.36					
2023	\$3.84		\$15.36					
2024	\$3.84		\$15.36					
2025	\$3.84		\$15.36					
2026	\$3.84		\$15.36					
2027	\$3.84		\$15.36					
2028	\$3.84		\$15.36					
2029	\$3.84		\$15.36					
2030	\$3.84		\$15.36					
2031	\$3.84		\$15.36					
2032	\$3.84		\$15.36					
2033	\$3.84		\$15.36					
2034	\$3.84		\$15.36					
2035	\$3.84		\$15.36					
2036	\$3.84		\$15.36					
2037	\$3.84		\$15.36					
2038	\$3.84		\$15.36					
2039	\$3.84		\$15.36					
2040	\$3.84		\$15.36					
2041	\$3.84		\$15.36					
2042	\$3.84		\$15.36					
2043	\$3.84		\$15.36					
2044	\$3.84		\$15.36					
2045	\$3.84		\$15.36					
2046	\$3.84		\$15.36					
2047	\$3.84		\$15.36					
2048	\$3.84		\$15.36					
2049	\$3.84		\$15.36					
2050	\$3.84		\$15.36					
2051	\$3.84		\$15.36					
2052	\$3.84		\$15.36					
2053	\$3.84		\$15.36					
2054	\$3.84		\$15.36					
2055	\$3.84		\$15.36					
2056	\$3.84		\$15.36					
2057	\$3.84		\$15.36					
2058	\$3.84		\$15.36					
2059	\$3.84		\$15.36					
2060	\$3.84		\$15.36					
2061	\$3.84		\$15.36					
2062	\$3.84		\$45.00	\$1.74				
2063	\$3.84		\$57.60					
2064	\$3.84		\$57.60					
2065	\$3.84		\$57.60					
2066	\$3.84		\$57.60					
2067	\$3.84		\$77.00	\$2.69				
2068	\$3.84		\$28.80					
2069	\$3.84		\$28.80					
2070	\$3.84		\$28.80					
2071	\$3.84		\$28.80					
2072			(\$38.50)	(\$1.34)				

Probabilistic Life Cycle Cost Analysis Worksheet



Life Cycle Cost Analysis Form O-O

Alternative 1: CRCP Pavement for Auxiliary and HOV lane

0.85 ft. CRCP over 0.25 ft. HMA-Type A over 0.7 ft. Class 2 AS

Pavement Design Life: <u> 40 </u> Years	
Initial Construction Cost:	<u>\$ 5,614,000</u>
Future Maintenance & Rehabilitation Cost:**	<u>\$ 211,200</u>
TOTAL AGENCY COST:	<u>\$ 5,825,200</u>
TOTAL USER COST:	<u>\$ 0</u>
TOTAL LIFE-CYCLE COST:	<u>\$ 5,825,200</u>

Alternative 2:*

0.9 ft. JPCP over 0.25 ft. HMA-Type A over 0.7 ft. Class 2 AS

Pavement Design Life: <u> 40 </u> Years	
Initial Construction Cost:	<u>\$ 5,238,000</u>
Future Maintenance & Rehabilitation Cost:**	<u>\$ 1,542,000</u>
TOTAL AGENCY COST:	<u>\$ 6,780,800</u>
TOTAL USER COST:	<u>\$ 3,080</u>
TOTAL LIFE-CYCLE COST:	<u>\$ 6,783,880</u>

The lowest Life Cycle Cost Alternative is No. 1 40-year CRCP

* Repeat as often as needed, with appropriate numbering, to cover all pavement alternatives investigated.

** Includes future maintenance, construction, and project support costs.

Memorandum

*Serious drought.
Help save water!*

To: Mr. Matthew Cugini (Chief)
Design Branch C
CADD Support in District 12

Attention: Mr. Fred Faizi

Date: June 8, 2016

File: 12-ORA-405-PM
2.6/5.83
EA 12-0M350
EFIS. 1212000018

From: DEPARTMENT OF TRANSPORTATION
Division of Engineering Services
METS-Geotechnical Service
Office of Geotechnical Design South-1

Subject: Geotechnical design report for retaining wall No. 329

INTRODUCTION

As requested by your office dated August 24, 2015, the following is the geotechnical recommendations for the retaining wall No. 329 in front of the sound wall along Southbound 405 from Culver Drive Northbound on-ramp in Orange County.

PROJECT LOCATION

The project site extends from San Diego Creek Bridge in the North to South of San Canyon Avenue OC. The retaining wall No. 329 location is at the intersection of the Northbound Culver Drive on-ramp to Interstate 405 Southbound (I-405), in District 12, Orange County (Figure 1).

SCOPE OF WORK

The geotechnical work performed for this project includes:

- Review of geologic information.
- Visual inspection of job site.
- Laboratory tests.
- Subsurface exploration.
- Interpretation of subsurface geologic and groundwater conditions.
- Preparation of this memorandum to present geotechnical recommendation for the design of the proposed retaining wall.

PROJECT DESCRIPTION

The structure included in the project that requires geotechnical recommendations is a retaining wall that will be constructed to accommodate the additional #5 lane and the realigned South bound 405 off-ramp to Culver Drive and continuing to the South Bound 405 University Drive/ Jeffrey Road Off-Ramp.

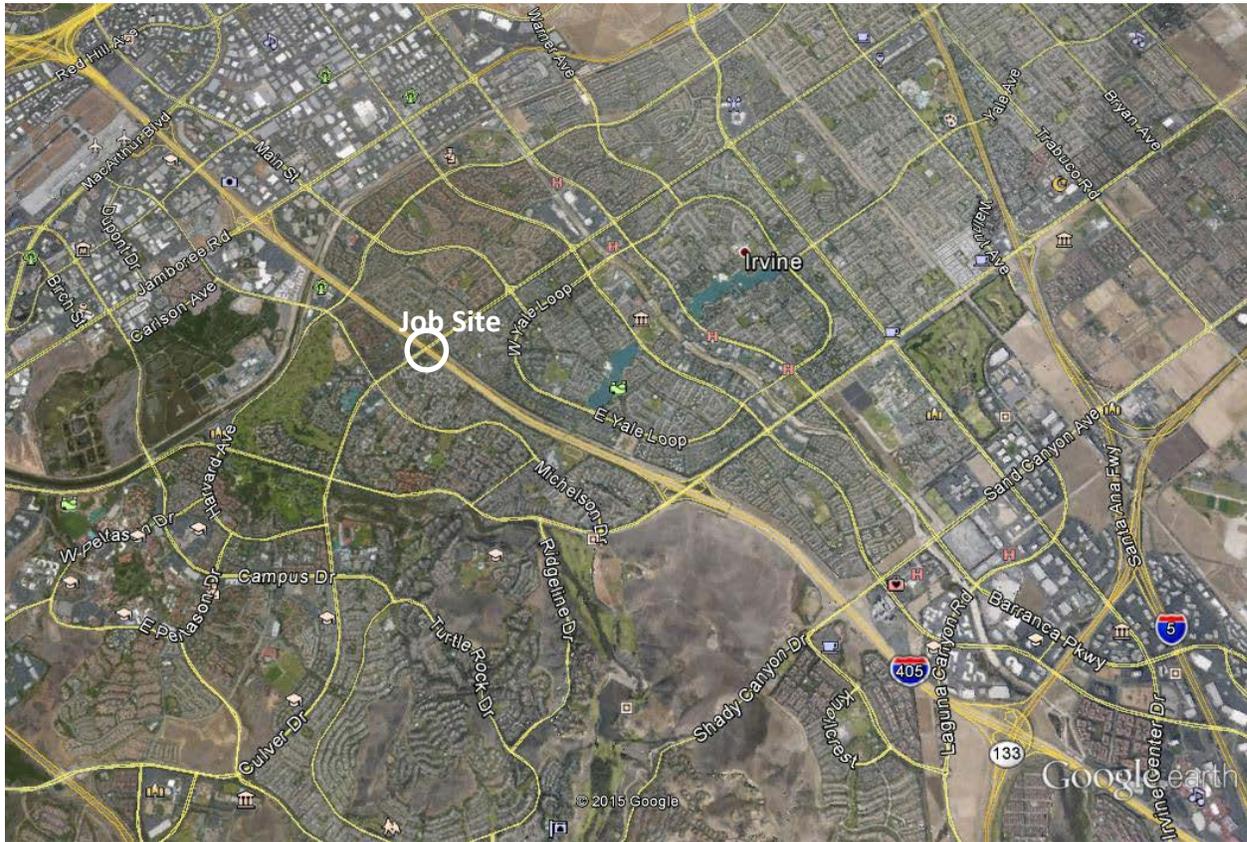


Figure 1. Job Site Vicinity Map

PROPOSED EARTH RETAINING SYSTEM

According to the planning study layout, and cross sections provided by the District 12 Design, approximated locations and estimated Earth Retaining Structure (ERS) wall heights are summarized in Table 1.

Table 1. Locations of Proposed Retaining Wall

ERS Type	Wall ID	Station (“D” Line)		Length (ft)	Retaining Wall Height Range (ft)
		Begin	End		
Retaining Wall	RW329	28+80	32+00	320.00	4-8

SUBSURFACE EXPLORATION

Previous Site Investigation

As-Built Log Of Test Borings (LOTBs) from a previous subsurface exploration for the consideration of the bridge as a part of the “As-Built” plan, dated April 1965 are also available. Based on the “As-Built”

“Provide a safe, sustainable, integrated and efficient transportation system to enhance California’s economy and livability”

LOTBs, three boreholes including two penetrations and one rotary wash boreholes were advanced to depths of approximately 30 feet to 40 feet.

Current Field Program

Subsurface exploration for this project was performed on August 4, 2015. Subsurface exploration applicable for the subject retaining wall includes one borehole using hollow-stem auger (6.5 inch outer diameter). Standard Penetration Tests (SPT's) were performed during boring. SPT N-Values were recorded at 5 foot intervals during drilling. The SPTs were performed in accordance with ASTM Test Method D1586. Boring information is summarized in Table 2. Boring was logged based on visual observations of the soil cuttings and collected samples. The location and elevation of this boring is provided by the office of District 12 surveys.

Table 2. Summary of Subsurface Investigation

Boring No.	Completion Date	Drill Rig Type	Hammer Type	Hammer Efficiency	Approx. Ground Surface Elevation (ft)	Boring Depth (ft)
A-15-001	8/4/2015	Acker AD2	Automatic	68	75.40	50

LABORATORY TEST

The samples obtained during the subsurface exploration were assigned to the laboratory for visual examination and testing. The soils were classified in accordance with Soil and Rock Logging Classification, and Presentation Manual, Caltrans June 2010. The laboratory testing program consisted of corrosivity tests, particle-size analysis, and Atterberg Limits of soils.

SITE GEOLOGY AND SUBSURFACE CONDITIONS

Site Geology

For this report, we reviewed the Preliminary Digital Geologic Map of the Santa Ana 30'X60' Quadrangle, Southern California, Version 2.0, Compiled by D.M. Morton (2004). According to Morton (2004), the job site is underlain by young axial channel deposits, Qya (Holocene and latest Pleistocene). These are fluvial alluvium deposited along canyon floors that consist of unconsolidated sand, silt, and clay. The map represents the area as Qyaca, (see Figure 2) indicating that specific area is mostly clay-bearing (c) and arenaceous or sandy (a).

The project is also underlain by young alluvial fan deposits, Qyf (Holocene and latest Pleistocene). The alluvial fan deposits consist of gravel, sand, and silt. Morton (2004) represents this area as Qyfa, (see Figure 2) indicating this specific area is mostly arenaceous (a) or sandy.

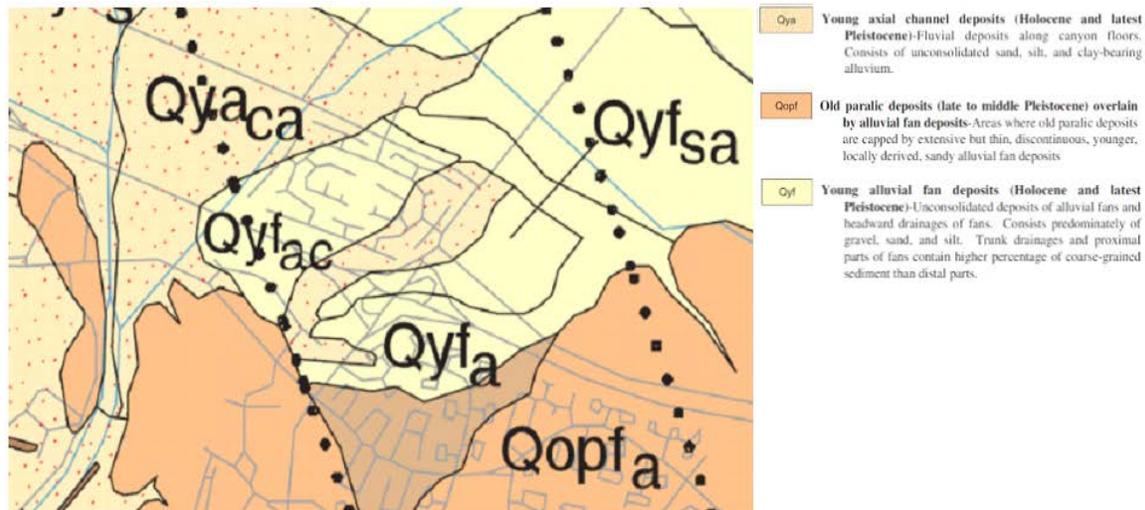


Figure 2. Job Site Vicinity Geologic Map

Subsurface Conditions

The soils encountered at the project site during current subsurface exploration are generally confirmed the soil conditions described on the “As-Built LOTB dated April 1965. The generalized stratigraphic profile at the borehole location consisted of medium dense silty sand or medium dense clayey sand (elev. 50 feet to elev. 75 feet), stiff sandy lean clay to medium dense silty sand (elev. 30 feet to elev.50 feet), and medium dense poorly graded sand with silt (elev. 25 feet to elev.30 feet).

Groundwater

Ground water was encountered within the boring drilled during the current subsurface exploration (August 4, 2015) at elev. of 28.4 feet, and the boring performed on August 19, 1965 at elev. of 24 feet. It should be noted that ground water table levels can fluctuate with the change of season and other factors including local irrigation, seasonal rains, and local surface hydrology.

SEISMIC STUDY

Ground Motion

The job site is not located within any reported Alquist-Priolo Earthquake Fault Zone. Based on the Caltrans ARS online tool (v2.3.06), proposed retaining walls are 1.6 miles (2.5 km) from, and to the southwest of the San Joaquin Hills Fault. As summarized in Table 3, this fault is a reverse fault, for which the magnitude of the maximum credible earthquake (MCE) is 7.0. The design median peak ground acceleration (PGA) at bridge location is approximately 0.63g.

Table 3. Summary of Seismic Parameters

Fault	Fault Type	Maximum Magnitude (MMax)	Distance	Fault Dip	Dip Direction	PGA
San Joaquin Hills	Rev	7.0	1.6 mile (2.5 km)	23 degrees	W	0.63g

Based on the soil properties of as-built LOTBs, the job site is classified as Site Class D. With the site class and standard penetration test (SPT) N values, soil shear velocity (V_{30} , average shear velocity in top 30 meter) was estimated as 886 ft/sec (270 m/sec). The recommended design response spectrum which is composed of both deterministic and probabilistic spectra is shown on Figure 3.

Liquefaction

Based on the subsurface condition and the groundwater information presented in the current subsurface exploration, the liquefaction potential is considered low.

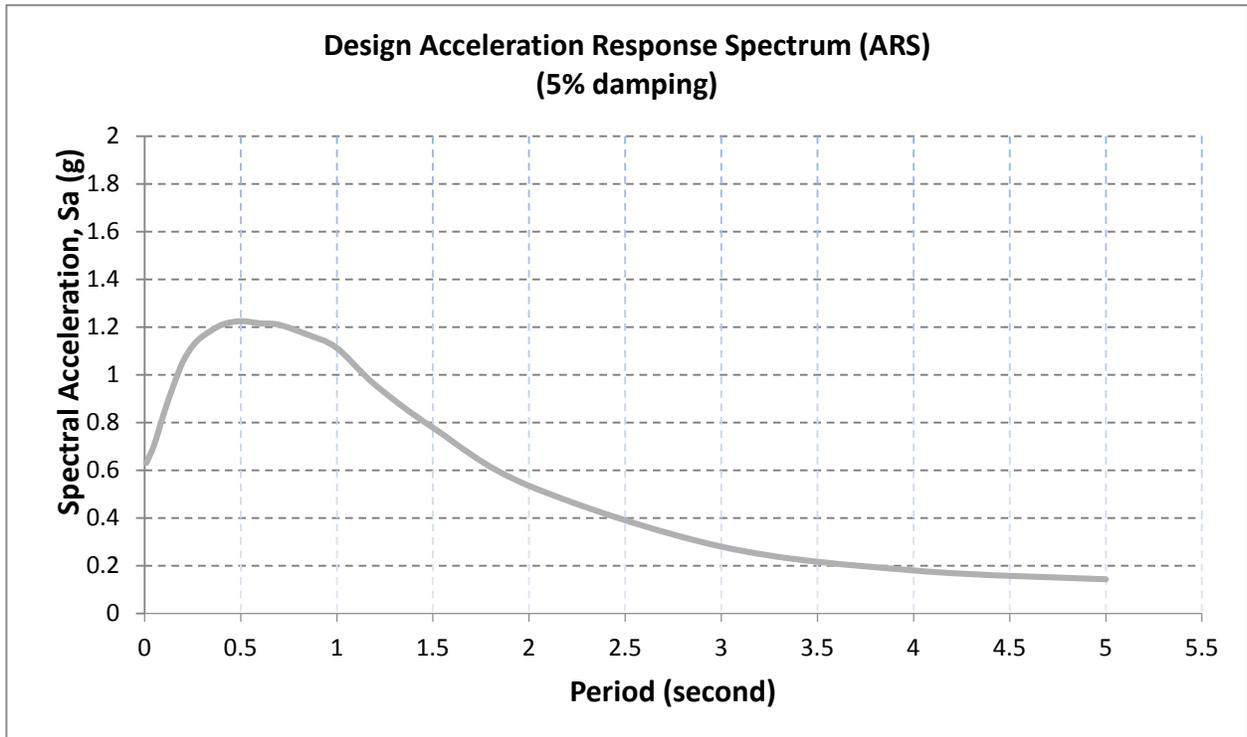


Figure 3. Recommended Acceleration Response Spectra (ARS) curve

Ground Rupture

Since no known fault crosses the job site, the potential for ground rupture at this site due to fault movement is negligible.

CORROSIVITY

Corrosivity of subsurface materials at the depth of 15-ft and 35-ft below the existing grade was tested and reported on August 20, 2015 in accordance with CTM 643, 417, and 422. The test results summarized in Table 4 indicated that the subsurface materials in the project area are non-corrosive.

Table 4. Corrosion Test Summary of the Composite Samples

TL 101 Number	Boring Number	Sample Depth (ft)	pH	Minimum Resistivity (ohm-cm)	Chloride Content (ppm)	Sulfate Content (ppm)
C721734A	A-15-001	15	8.77	762	100	442
C721734B	A-15-001	35	8.40	649	280	273

Note:

The Caltrans Corrosion Guidelines state that if the minimum resistivity is greater than 1000 Ohm-Cm the sample is considered to be non corrosive and testing to determine sulfate and chloride is not performed. Caltrans currently considers a site to be corrosive to foundation elements if one or more of the following conditions exist: Chloride concentration is greater than or equal to 500 ppm, sulfate concentration is greater than or equal to 2000 ppm, or the pH is 5.5 or less.

GEOTECHNICAL EVALUATION AND RECOMMENDATIONS

Soil Engineering Properties

For design purposes, the soil engineering and the structure backfill properties used in the proposed retaining wall design are summarized in the Tables 5 and 6 respectively.

Table 5. Soil Engineering Properties

Layer No.	Depth (ft)	Elevation (ft)	Soil Type	Shear Strength Parameters	SPT N values
1	0 – 25	50.4-75.4	Silty SAND	$\gamma = 115$ pcf; $\phi = 32^\circ$	9- 19
2	25 - 45	30.4-50.4	Sandy lean Clay,	$\gamma = 115$ pcf; undrained shear strength 1200 psf	10- 24
3	45 - 50	25.4-30.4	Poorly graded SAND with Silt	$\gamma = 115$ pcf; $\phi = 32^\circ$	15

Table 6. Structure Backfill Engineering Properties

Maximum Cantilever Retaining Wall Height (ft)	Soil Type	Shear Strength Parameters	Minimum Relative Compaction
4-8	Structure Backfill	$\gamma = 120 \text{ pcf}; \phi = 34^\circ$	>95 Percent

Based on LOTB-A-15-001 information and the foundation elevation of the retaining wall, majority of the retaining wall is placed on the silty-sand soil.

Evaluation of Feasible ERS Types

From the above evaluation, cantilever retaining walls are recommended for the project. Caltrans 2010 Standard Plans and a retaining wall height of less than 30 feet and higher than 6 feet, Revised Standard Plans B3-1A should be used. If the retaining wall height is less than 6 feet, Revised Standard Plans B3-7A should be used.

The allowable bearing pressure for the proposed wall footing foundations is based on the minimum footing widths shown on Caltrans Revised Standard Plan Sheets B3-1A and B3-7A and minimum footing embedment of 2-ft.

Construction Considerations

1) The limits of compacted fill foundations beneath the wall are as follows:

- Wall footings should be founded at least 2-ft below the grade. We recommend that the walls should be founded on engineered fill placed and compacted to 95% relative compaction. Where the wall is to be founded in native ground, the soil below the base of the footing should be over-excavated to a depth equal to the footing width and replaced with engineered backfill compacted to 95% relative compaction.
- Wall footings on the slope should be founded at least 2-ft below the proposed footing bottom elevation and 2 feet horizontally outward from the outer edge of footing should be excavated and replaced with engineered fill compacted to 95% relative compaction.
- The slope of excavation for the compacted fill should not be steeper than 1:1 slope.

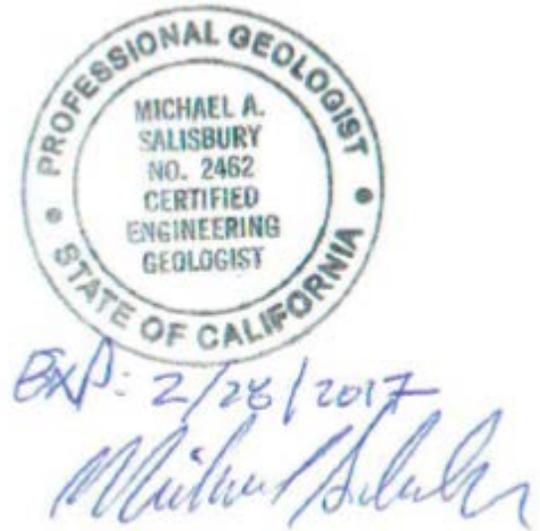
2) Earthwork should be performed in accordance with Sections 6 and 19 of Caltrans 2010 Standard Specifications.

If you have any questions or comments, please call Sungro Cho at (916) 227-5398, or James Lee at (916) 227-7066 or Michael Salisbury at (916) 227-5392 or Deh-Jeng Jang at (916) 227-5722.

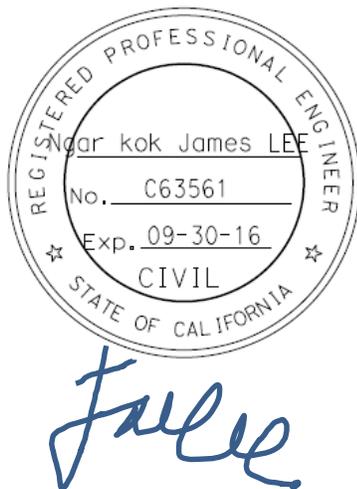
Prepared by: Date: 06/08/2016



Sungro Cho, Ph.D., P.E.
Transportation Engineer
Branch A



Michael Salisbury, C.E.G.
Engineering Geologist
Branch A



Ngar Kok James LEE, Ph.D., P.E.
Transportation Engineer

Branch A

Memorandum

*Serious drought.
Help save water!*

To: Mr. Kamran Mazhar
Design Branch F Chief
District 12

Date: April 13, 2016

Attention: Ms. Bernadette Suraweera

File: 12-ORA-405-PM
2.6/6.5
EA 12-0M350
EFIS. 1212000018

From: DEPARTMENT OF TRANSPORTATION
Division of Engineering Services
METS-Geotechnical Service
Office of Geotechnical Design South

Subject: Geotechnical design report for OH sign structures (OS 1-2, 3-2, 7-2, 8-2, 11-1, 14-1, 14-3)

INTRODUCTION

As requested by your office dated July 15, 2015, the following is the geotechnical recommendations for the Overhead (OH) Sign post foundations proposed on State Route 405 (I-405) in Orange County.

PROJECT LOCATION

The job site is located between 0.3 mile south of Sand Canyon Avenue OC-PM2.6 to 0.4 mile south of Jamboree Road OC-PM6.5, Interstate 405 (I-405), in District 12, Orange County (Figure 1).

SCOPE OF WORK

The geotechnical work performed for this project includes:

- Review of geologic information.
- Visual inspection of job site.
- Laboratory tests.
- Subsurface exploration.
- Interpretation of subsurface geologic and groundwater conditions.
- Preparation of this memorandum to present geotechnical recommendation for the design of the proposed sign structure foundations.

PROJECT DESCRIPTION

The proposed project consists of 7 new sign structures. The information on the proposed sign structures provided by District is summarized in Table 1.

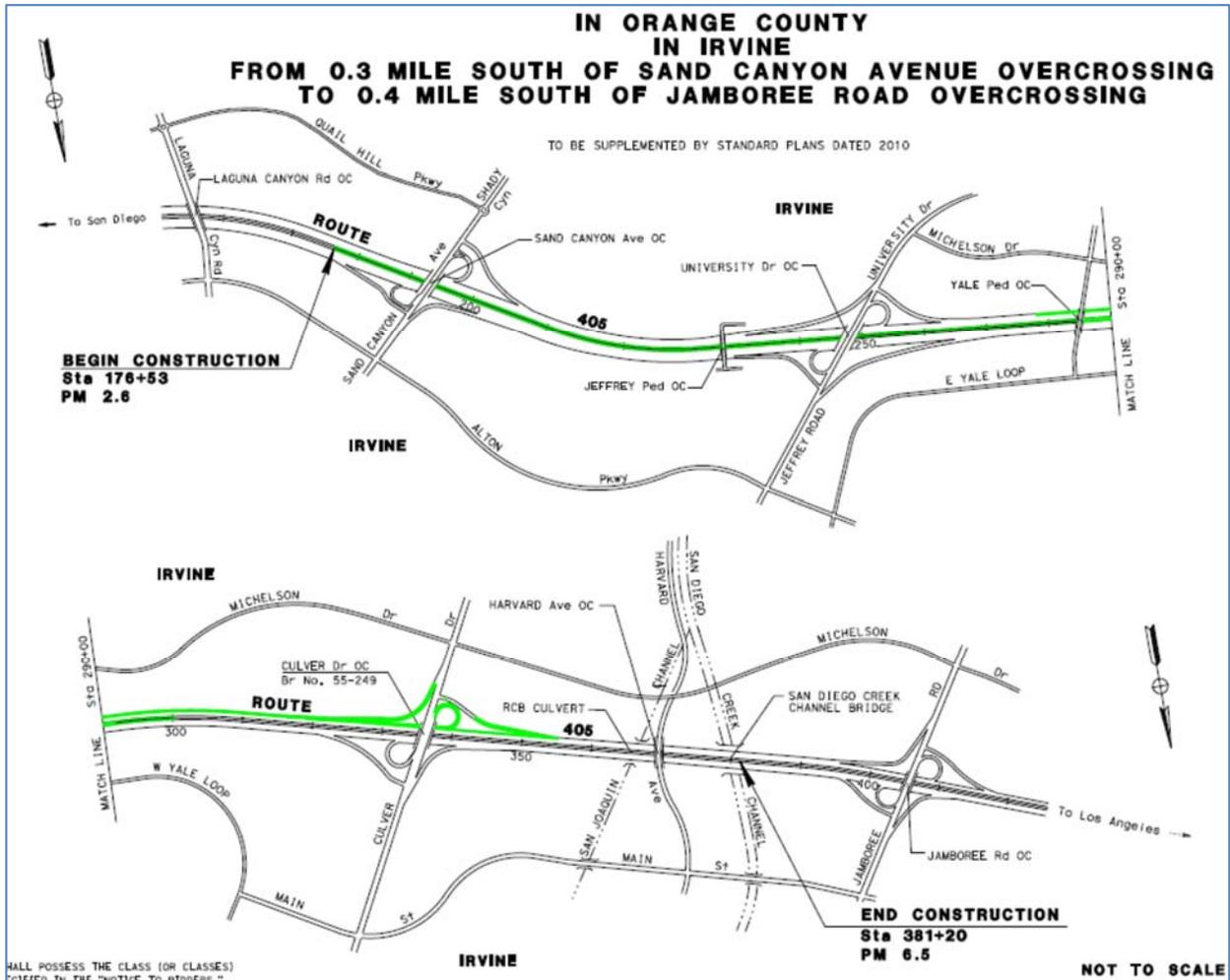


Figure 1. Job Site Vicinity Map

Table 1. Overhead Sign Locations

Sign Number	Station ("A" line)	Post Type	Direction	Foundation-CIDH Pile		Available Boring No.
				Diameter	Length	
OS 1-2	184+75 ("A" line)	VIII	FNBT	5.0 ft	25.0 ft	A-15-005
OS 3-2	209+50 ("A" line)	VIII	FSBT	5.0 ft	25.0 ft	A-15-005
OS 7-2	265+25 ("A" line)	VIII	FSBT	5.0 ft	25.0 ft	A-15-004
OS 8-2	280+25 ("A" line)	VIII	FNBT	5.0 ft	25.0 ft	A-15-003, A-15-004
OS 11-1	316+32 ("A" line)	VI	FSBT	5.0 ft	22.0 ft	A-15-003
OS 14-1	40+70 ("B" line)	II-S	FSBT	4.5 ft	19.7 ft	A-15-001, A-15-002
OS 14-3	351+90 ("A" line)	VIII	FSBT	5.0 ft	25.0 ft	A-15-002

SUBSURFACE EXPLORATION

Subsurface exploration for this project was performed in August and September 2015. Five boreholes were drilled using hollow-stem auger with 6.5 inch outer diameter. Standard Penetration Tests (SPTs) were performed during boring. SPT N-Values were recorded at 5 foot intervals during drilling. The SPTs were performed in accordance with ASTM Test Method D1586. Boreholes information is summarized in Table 2. Borings were logged based on visual observations of the soil cuttings and collected samples. The locations and elevations of these borings was provided by the District Surveys.

Table 2. Summary of Subsurface Investigation

Boring No.	Completion Date	Drill Rig Type	Hammer Type	Hammer Efficiency	Approx. Ground Surface Elevation (ft)	Boring Depth (ft)
A-15-001	8/4/2015	Acker AD2	Automatic	68	75.40	50
A-15-002	9/29/2015	CME-85	Automatic	82	51.65	30
A-15-003	9/29/2015	CME-85	Automatic	82	79.79	30
A-15-004	9/30/2015	CME-85	Automatic	82	112.88	30
A-15-005	9/30/2015	CME-85	Automatic	82	145.50	30

LABORATORY TEST

The samples obtained during the subsurface exploration were selected and assigned to laboratory test. The soils were classified in accordance with Soil and Rock Logging, Classification, and Presentation Manual, Caltrans June 2010. The laboratory test program consisted of corrosivity tests, particle-size analysis, and Atterberg Limits of soils.

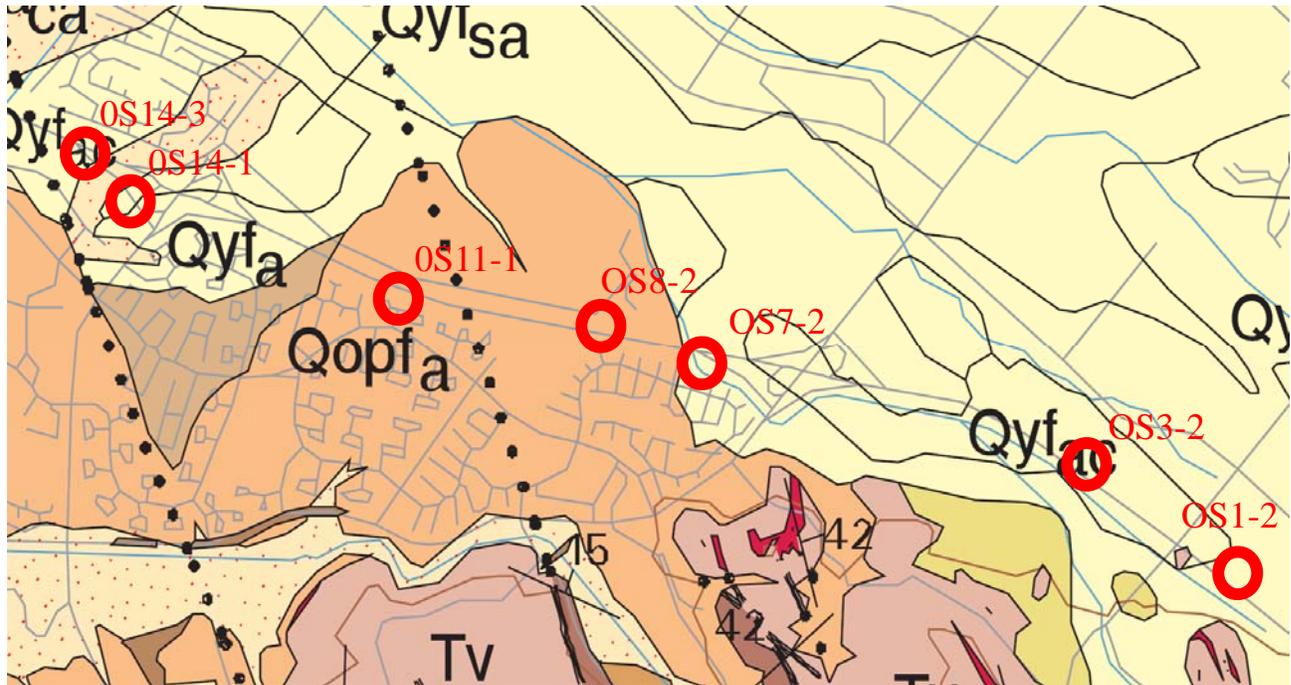
SITE GEOLOGY AND SUBSURFACE CONDITIONS

Site Geology

For this report we reviewed the Preliminary Digital Geologic Map of the Santa Ana 30' X60' Quadrangle, Southern California, Version 2.0, Compiled by D.M. Morton (2004). The figure represents the approximate location of overhead signs in red circles with red labels. The proposed location for signs OS14-1, OS3-2, OS14-3, OS7-2, and OS1-2 are underlain by young alluvial fan deposits, Qyf (see figure). The alluvial fan deposits consist of gravel, sand, and silt. Morton (2004) represents these areas as Qyf_{ac} (OS14-3 and OS3-2), Qyf_a (OS14-1), and Qyf_{sa} (OS7-2 and OS1-2). Qyf_{ac} indicates predominantly clay and sands, Qyf_a indicates sediments are mostly sands, and Qyf_{sa} indicates the specific area is predominantly sand and silt.

The proposed locations for the signs OS8-2, and OS 11-1 overlies old paralic deposits overlain by alluvial fan deposits, Qopf_a (see figure). Paralic deposits are sediments that are deposited in

environments near sea level such as tidal/beach environments or estuaries. These deposits are unconsolidated alluvial fans and drainages consisting of gravel, sand, and silt.



- Qopf** Old paralic deposits (late to middle Pleistocene) overlain by alluvial fan deposits-Areas where old paralic deposits are capped by extensive but thin, discontinuous, younger, locally derived, sandy alluvial fan deposits
- Qyf** Young alluvial fan deposits (Holocene and latest Pleistocene)-Unconsolidated deposits of alluvial fans and headward drainages of fans. Consists predominately of gravel, sand, and silt. Trunk drainages and proximal parts of fans contain higher percentage of coarse-grained sediment than distal parts.

Figure 2. Job Site Vicinity Geologic Map

Subsurface Conditions

Based on information from recent subsurface explorations, at the proposed locations for OS 1-2 and OS 3-2 the subsurface materials generally consist of medium dense clayey sand in the upper 20 feet, underlain by 5 feet of stiff sandy lean clay, and subsequently 5 feet of medium dense clayey sand layers. At OS 7-2, the soil consists of medium dense clayey sand in the upper 10 feet, underlain by 20 feet of medium dense to dense silty sand. At OS 8-2 and OS 11-1, the upper 20 feet of soil consists of medium dense to dense silty sand, underlain by 10 feet of very stiff sandy lean clay. At OS 14-1, the soil consists of medium dense to dense clayey sand in the upper 10 feet, underlain by 10 feet of stiff sandy lean clay, underlain 5 feet of medium dense to dense clayey sand, and then subsequently 5 feet of medium dense silty sand. At OS 14-3, the upper 10 feet of soil consists of medium dense clayey sand, underlain by 5

feet of stiff sandy lean clay, 5 feet of medium dense clayey sand, 5 feet of stiff sandy lean clay, and 5 feet of medium dense silty sand.

The idealized soil profiles and soil strength parameters for foundation design are summarized in Table 3.

Table 3. Idealized Soil Profile and Strength Parameters

Sign Number	Approx. Elevation (ft)	Approx. Estimated Groundwater Elevation (ft)	Predominant Soil Type USCS	Total Unit Weight (pcf)	Friction Angle (degree)	Cohesion (psf)
OS 1-2 (Sta. 184+75, A line)	138 - 158	128	SC	120	33	0
	133 - 138		CL	120	0	1200
	128 - 133		SP-SM/SC	120	33	0
OS 3-2 (Sta. 209+50, A line)	120 - 140	110	SC	120	33	0
	115 - 120		CL	120	0	1200
	110 - 115		SP-SM/SC	120	33	0
OS 7-2 (Sta. 265+25, A line)	101 - 111	NA	SC	120	33	0
	81 - 101		SM	120	33	0
OS 8-2 (Sta. 280+25, A line)	85 - 105	NA	SM	120	33	0
	75 - 85		CL	120	0	1200
OS 11-1 (Sta. 316+32, A line)	50 - 70	NA	SM	120	33	0
	40 - 50		CL	120	0	1200
OS 14-1 (Sta. 40+70, B line)	48 - 58	28 ~ 32	SC	120	33	0
	38 - 48		CL	120	0	1200
	33 - 38		SC	120	33	0
	28 - 33		SM	120	33	0
OS 14-3 (Sta. 351+90, A line)	38 - 48	28	SC	120	33	0
	33 - 38		CL	120	0	1200
	28 - 33		SC	120	33	0
	23 - 28		CL	120	0	1200
	18 - 23		SM	120	33	0

Note

Ground water table levels can fluctuate with the change of season and other factors including local irrigation, seasonal rains, and local surface hydrology.

Groundwater

Ground water was encountered during the subsurface exploration at A-15-001, A-15-002, and A-15-005 at the depths of 47 feet (elev. 28.4 feet), 20 feet (elev. 31.7 feet), and 30 feet (elev. 115.5 feet) below ground surfaces, respectively. It should be noted that ground water table levels can fluctuate with the change of season and other factors including local irrigation, seasonal rains, and local surface hydrology.

Seismic Evaluation

The job site is not located within any California Geological Survey (CGS) designated Earthquake Fault Zone (EFZ). The job site is not considered prone to surface fault rupture hazard; therefore, the possibility of surface fault reapture hazard at this site is considered low.

Liquefaction

Although groundwater table is assumed relatively shallow at the some of locations, liquefaction potential is considered to be low because of clay type soil and relatively high densities of the subsurface material at the site.

CORROSIVITY

Corrosivities of subsurface materials at each borehole location was tested and reported on August and October 2015 in accordance with CTM 643, 417, and 422. The test results summarized in Table 4 indicated that the subsurface materials in the project area are non-corrosive.

Table 4. Corrosion Test Summary of the Composite Samples

TL 101 Number	Boring Number	Sample Depth (ft)	pH	Minimum Resistivity (ohm-cm)	Chloride Content (ppm)	Sulfate Content (ppm)
C721734	A-15-001	15	8.8	762	100	442
C721734	A-15-001	35	8.4	649	280	273
C703251	A-15-002	20	8.4	808	130	175
C703252	A-15-003	15	8.7	745	149	317
C703253	A-15-004	15	8.3	877	139	348
C703254	A-15-005	20	8.2	882	47	191

Note:

The Caltrans Corrosion Guidelines state that if the minimum resistivity is greater than 1000 Ohm-Cm the sample is considered to be non corrosive and testing to determine sulfate and chloride is not performed. Caltrans currently considers a

site to be corrosive to foundation elements if one or more of the following conditions exist: Chloride concentration is greater than or equal to 500 ppm, sulfate concentration is greater than or equal to 2000 ppm, or the pH is 5.5 or less.

GEOTECHNICAL ANALYSIS

The design of pile foundations for sign structures is primarily governed by lateral capacities of the piles. It should be noted that the Standard Plan pile depths were determined based on the AASHTO 2001, Article 13.6 Brom's approximate procedure assuming a cohesionless soil with angle of friction equal to 30 degrees and unit weight of soil equal to 120 pcf or a shear strength of 1.2 ksf for cohesive soils. The estimated strength parameters at the proposed sign structure locations as summarized in Table 3 exceed the assumed design parameters.

Computer software LPILE 2012.6.37 was used to calculate the lateral deflection of CIDH piles to verify that the pre-selected foundation depth is sufficient to support the proposed overhead signs. Service loads at the top of pile for Overhead Signs, estimated and provided by Mr. K C Liu, and LPILE analysis results are summarized in Table 5.

Table 5. Service Load, Maximum Allowable Pile Head Deflection, and LPILE Analysis Results

Sign No	Axial Force (Kips)	Shear Force (Kips)	Bending Moment (Kips-ft)	Maximum Allowable Pile Head Deflection (inch)	L-pile Analysis		
					Pile Head Deflection (inch)	Maximum Moment (Kips-ft) and the Depth	Maximum Shear (Kips) and the Depth
OS 1-2	23.6	16.1	464.0	1.00	0.31	530 (6.4-ft)	47 (19.0-ft)
OS 3-2	23.6	16.1	464.0	1.00	0.31	530 (6.4-ft)	47 (19.0-ft)
OS 7-2	23.0	15.7	458.0	1.00	0.34	517 (6.0-ft)	42 (17.3-ft)
OS 8-2	23.6	16.1	464.0	1.00	0.31	530 (6.4-ft)	47 (19.0-ft)
OS 11-1	15.2	10.4	274.0	1.00	0.26	311 (6.0-ft)	29 (16.4-ft)
OS 14-1	12.5	8.8	239.0	0.90	0.25	267(5.0-ft)	39 (14.2-ft)
OS 14-3	23.6	15.6	470.0	1.00	0.25	540 (7.0-ft)	50 (18.0-ft)

Based on the LPILE analysis, the pile head deflections induced by the given load conditions are within the maximum allowable pile head deflections.

GEOTECHNICAL RECOMMENDATIONS

Based on the results of analysis, the pre-selected pile depths in Table 1 in accordance with Standard Plans S8, and S15, are sufficient to support the proposed signs without exceeding the maximum allowable pile-head deflection.

CONSTRUCTION CONSIDERATIONS

Notes for Specification Development

SS Section 49 Piling

SS 49-1 General

- Due to seasonal rainfall and fluctuating groundwater elevations, there is the high potential for groundwater to be encountered during the CIDH pile construction at the OS 14-3 location.

SS 49-3.02A(3)(b) Pile Installation Plan

- Prior to construction, the contractor should submit drawings for methods used to construct piles in wet holes for the engineer's approval.

SS 49-3.02C(3) Temporary Steel Casing

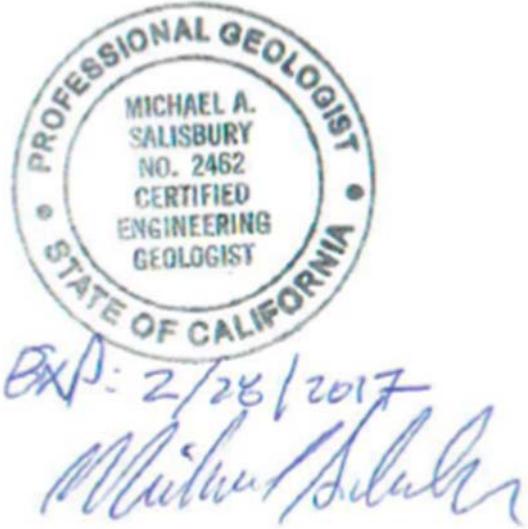
- Temporary casing or wet method might be required during construction of the CIDH pile at the OS 14-3 location.

If you have any questions or comments, please call Sungro Cho at (916) 227-5398, or James Lee at (916) 227-7066 or Michael Salisbury at (916) 227-5392 or Deh-Jeng Jang at (916) 227-5722.

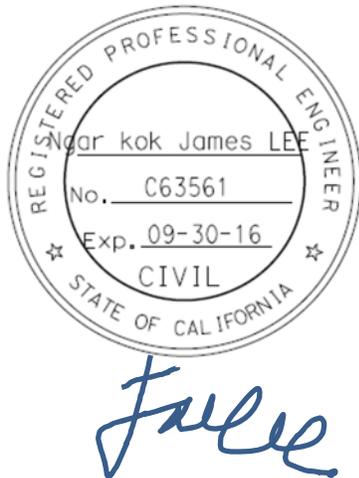
Prepared by: Date: 04/13/2016



Sungro Cho, Ph.D., P.E.
Transportation Engineer
Branch A



Michael Salisbury, C.E.G.
Engineering Geologist
Branch A



Ngar Kok James LEE, Ph.D., P.E.
Transportation Engineer
Branch A

AERIALY DEPOSITED LEAD SITE INVESTIGATION REPORT

**INTERSTATE 405 FROM SOUTHBOUND
CULVER DRIVE OFFRAMP TO
JEFFREY ROAD /UNIVERSITY DRIVE
OVERCROSSING
IRVINE, ORANGE COUNTY, CALIFORNIA**



GEOCON
CONSULTANTS, INC.

**GEOTECHNICAL
ENVIRONMENTAL
MATERIALS**

PREPARED FOR

**CALTRANS – DISTRICT 12
IRVINE, CALIFORNIA**

PROJECT NO. S9890-06-10

OCTOBER 19, 2015



Project No. S9890-06-10
October 19, 2015

Mr. David Yaghoubi
California Department of Transportation – District 12
Environmental Engineering
3334 Michelson Drive, Suite 100
Irvine, California 92612-8894

Subject: AERIALY DEPOSITED LEAD SITE INVESTIGATION REPORT
INTERSTATE 405 FROM SOUTHBOUND CULVER DRIVE OFFRAMP TO
JEFFREY ROAD /UNIVERSITY DRIVE OVERCROSSING
IRVINE, ORANGE COUNTY, CALIFORNIA
CONTRACT NO. 12A1535, TASK ORDER NO. 12-0M3501-10, EA 12-0M3501

Dear Mr. Yaghoubi:

In accordance with California Department of Transportation (Caltrans) Contract No. 12A1535, Task Order No. 12-0M3501-10, and Expense Authorization No. 12-0M3501, we performed environmental engineering services at the project locations. The project is located along Interstate 405 from the southbound Culver Drive offramp to the Jeffrey Road/University Drive overcrossing in Irvine, Orange County, California. The accompanying report summarizes the services performed including the excavation of 63 hand-auger borings for the collection of soil samples for aerially deposited lead analysis.

The contents of this report reflect the views of the authors, who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the State of California or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

Please contact us if you have any questions concerning this report or if we may be of further service.

Sincerely,

GEOCON CONSULTANTS, INC.

Gemma G. Reblando
Project Geologist

Michael Conkle, PG
Senior Geologist



(5 + 1 CD) Addressee

TABLE OF CONTENTS

AERIALY DEPOSITED LEAD SITE INVESTIGATION REPORT		PAGE
1.0	INTRODUCTION	1
1.1	Project Description and Proposed Improvements	1
1.2	General Objectives	1
2.0	BACKGROUND	1
2.1	Potential Lead Soil Impacts	1
2.2	Hazardous Waste Determination Criteria	1
2.3	DTSC Variance	3
3.0	SCOPE OF SERVICES	4
3.1	Pre-field Activities	4
3.2	Field Activities	4
4.0	INVESTIGATIVE METHODS	5
4.1	Soil Sampling Procedures	5
4.2	Quality Assurance/Quality Control Procedures	5
4.3	Laboratory Analyses	5
4.4	Deviations from Workplan	6
5.0	FIELD OBSERVATIONS AND INVESTIGATIVE RESULTS	6
5.1	Soil Description	6
5.2	Soil Analytical Results	6
5.3	Laboratory QA/QC	7
5.4	Statistical Evaluation for Lead Detected in Soil Samples	7
5.4.1	Calculating the UCLs for the Arithmetic Mean	8
5.4.2	Correlation of Total and Soluble Lead	9
6.0	CONCLUSIONS AND RECOMMENDATIONS	10
6.1	Median	10
6.2	OH Sign Structure/Panel at the SB University Drive Offramp – B28	10
6.3	Southbound Shoulder	12
6.4	Culver Drive SB Loop Onramp, Offramp, Shoulders	13
6.5	Culver Drive SB Slip Onramp	14
6.6	University Drive SB Onramp	15
6.7	Worker Protection	15
7.0	REPORT LIMITATIONS	16

FIGURES

- 1. Vicinity Map
- 2-1 to 2-15. Site Plans

TABLE

- 1. Boring Coordinates and Summary of Lead and pH Analytical Results

APPENDICES

- A. DTSC Variance and Extension Letters
- B. Laboratory Reports and Chain-of-custody Documentation
- C. Lead Statistics and Regression Analysis Results

AERIALY DEPOSITED LEAD SITE INVESTIGATION REPORT

1.0 INTRODUCTION

This Aerially Deposited Lead (ADL) Site Investigation Report for the Interstate 405 (I-405) from the Culver Drive offramp to the Jeffrey Road Overcrossing (OC) Project was prepared under California Department of Transportation (Caltrans) Contract No. 12A1535, Task Order (TO) No. 12-0M3501-10, and Expense Authorization (EA) No. 12-0M3501.

1.1 Project Description and Proposed Improvements

The project locations consist of Caltrans right-of-way (ROW) along I-405 from the Culver Drive offramp to Jeffrey Road/University Drive OC (the Site) in Irvine, Orange County, California. Caltrans proposes to replace the existing temporary railing (Type K) with permanent concrete barrier along the centerline of I-405 within the project limits, and to extend the second auxiliary lane of southbound (SB) I-405 from the Culver Drive offramp to Jeffrey Road/University Drive OC. The approximate project locations are depicted on the Vicinity Map, Figure 1, and Site Plans, Figures 2-1 to 2-15.

1.2 General Objectives

The proposed highway improvements will require the disturbance of soil at the project locations and will generate excess soil. The purpose of the scope of services outlined in TO No. 12-0M3501-10 was to evaluate the Site for potential impacts due to ADL from motor vehicle exhaust in the surface and near-surface soils. The investigative results will be used by Caltrans to inform the construction contractor if ADL-impacted soil is present within the project boundaries for construction worker health and safety, and soil management and disposal purposes.

2.0 BACKGROUND

Caltrans requested the site investigation to provide data regarding the potential presence of ADL in soil within the proposed highway improvement areas.

2.1 Potential Lead Soil Impacts

Ongoing testing by Caltrans has indicated that ADL exists along major freeway routes due to emissions from vehicles powered by leaded gasoline.

2.2 Hazardous Waste Determination Criteria

Regulatory criteria to classify a waste as “California hazardous” for handling and disposal purposes are contained in the California Code of Regulations (CCR), Title 22, Division 4.5, Chapter 11, Article 3, § 66261.24. Criteria to classify a waste as “Resource, Conservation, and Recovery Act (RCRA) hazardous” are contained in Chapter 40 of the Code of Federal Regulations (40 CFR), § 261.

For waste containing metals, the waste is classified as California hazardous when: 1) the representative total metal content equals or exceeds the respective Total Threshold Limit Concentration (TTLC); or 2) the representative soluble metal content equals or exceeds the respective Soluble Threshold Limit Concentration (STLC) based on the standard Waste Extraction Test (WET). A waste may have the potential of exceeding the STLC when the waste's total metal content is greater than or equal to ten times the respective STLC value, since the WET uses a 1:10 dilution ratio. Hence, when a total metal is detected at a concentration greater than or equal to ten times the respective STLC, and assuming that 100 percent of the total metals are soluble, soluble metal analysis is required. A material is classified as RCRA hazardous, or Federal hazardous, when the representative soluble metal content equals or exceeds the Federal regulatory level based on the Toxicity Characteristic Leaching Procedure (TCLP). The TTLC value for lead is 1,000 milligrams per kilogram (mg/kg). The STLC and TCLP values for lead are both 5.0 milligrams per liter (mg/l).

The above regulatory criteria are based on chemical concentrations. Wastes may also be classified as hazardous based on other criteria such as ignitability and corrosivity; however, for the purposes of this investigation, toxicity (i.e., representative lead concentrations) is the primary factor considered for waste classification since waste generated during the construction activities would not likely warrant testing for ignitability or corrosivity. Waste that is classified as either California-hazardous or RCRA-hazardous requires management as a hazardous waste.

The Department of Toxic Substances Control (DTSC) regulates and interprets hazardous waste laws in California. DTSC generally considers excavated or transported materials that exhibit "hazardous waste" characteristics to be a 'waste' requiring proper management, treatment and disposal. Soil that contains lead above hazardous waste thresholds and is left in-place would not be necessarily classified by DTSC as a 'waste.' The DTSC has provided site-specific determinations that "movement of wastes within an area of contamination does not constitute 'land disposal' and, thus, does not trigger hazardous waste disposal requirements." Therefore, lead-impacted soil that is scarified in-place, moisture-conditioned, and recompacted during roadway improvement activities might not be considered a 'waste.' DTSC should be consulted to confirm waste classification. It is noted that in addition to DTSC regulations, health and safety requirements and other local agency requirements may also apply to the handling and disposal of lead-impacted soil.

2.3 DTSC Variance

The DTSC issued a statewide Variance effective July 1, 2009, regarding the management of ADL-impacted soils within Caltrans right-of-way. The original DTSC Variance expired on July 1, 2014, but was extended to June 30, 2015. Under the Variance, soil that originates from Caltrans right-of-way and is classified as a non-RCRA hazardous waste (i.e., California hazardous waste), based primarily on ADL content (i.e., total lead $\geq 1,000$ mg/kg and/or soluble WET lead ≥ 5 mg/l), may be suitable for reuse within Caltrans right-of-way. ADL soil that is classified as a RCRA hazardous waste is not eligible for reuse under the Variance and must be disposed of as a RCRA hazardous waste (Caltrans Type Z-3).

ADL soil reused under the Variance must always be at least 5 feet above the highest groundwater elevation and, depending on lead concentrations, must be covered with at least 1 foot of non-hazardous soil or a pavement structure. The ADL soil may not be placed in areas where it might contact groundwater or surface water (such as streams and rivers), and must be buried in locations that are protected from erosion that may result from storm water run-on and run-off.

Review of the statewide Variance indicates the following conditions regarding the reuse and management of ADL-impacted soil as fill material for construction and maintenance operations. If ADL soil meets the Variance criteria but is not intended to be reused within Caltrans right-of-way, then the excavated soil must be disposed of as a California hazardous waste (Caltrans Type Z2). Copies of the DTSC Variance and extension letters are presented in Appendix A.

Caltrans Type Y1

ADL soil exhibiting a total lead concentration less than or equal to 1,411 mg/kg, a soluble lead concentration (based on a modified WET using deionized water as the extractant [DI-WET]) less than or equal to 1.5 mg/l, and a pH value greater than or equal to 5.5 may be reused within the same Caltrans corridor and must be covered with at least one foot of non-hazardous soil.

Caltrans Type Y2

ADL soil exhibiting a total lead concentration less than or equal to 1,411 mg/kg, a DI-WET soluble lead concentration less than or equal to 1.5 mg/l, and a pH value greater than 5 and less than 5.5 may be reused within the same Caltrans corridor and must be covered and protected from infiltration by a pavement structure.

ADL soil exhibiting a total lead concentration less than or equal to 1,411 mg/kg, a DI-WET soluble lead concentration greater than 1.5 mg/l and less than or equal to 150 mg/l, and a pH value greater than 5 may be reused within the same Caltrans corridor and must be covered and protected from infiltration by a pavement structure.

ADL soil exhibiting a total lead concentration greater than 1,411 mg/kg and less than or equal to 3,397 mg/kg, a DI-WET soluble lead concentration less than or equal to 150 mg/l, and a pH value greater than 5 may be reused within the same Caltrans corridor and must be covered and protected from infiltration by a pavement structure.

Caltrans Type Z2

ADL soil exhibiting a total lead concentration greater than 3,397 mg/kg, a DI-WET soluble lead concentration greater than 150 mg/l, or a pH value less than or equal to 5 is not eligible for reuse under the Variance and must be disposed of as a California hazardous waste.

Caltrans Type Z3

ADL soil exhibiting a TCLP soluble lead concentration greater than or equal to 5.0 mg/l is not eligible for reuse under the Variance and must be disposed of as a RCRA hazardous waste.

3.0 SCOPE OF SERVICES

The scope of services requested by Caltrans in TO No. 12-0M3501-10 included the collection of soil samples for laboratory analysis to determine lead content and the preparation of this report.

3.1 Pre-field Activities

- Prepared a *Health and Safety Plan* dated July 2015 to provide guidelines on the use of personal protective equipment and the health and safety procedures implemented during the field activities.
- Retained the services of Advanced Technology Laboratories (ATL), a Caltrans-approved and California-certified analytical laboratory, to perform the chemical analyses of soil samples.

3.2 Field Activities

Between July 14 and 21, 2015, a total of 229 soil samples were collected from 63 hand-auger borings located along the unpaved median and shoulder areas of SB I-405. No borings were advanced at B7 and B58 since these locations are paved. The soil borings were advanced to the maximum sampling depth of 4.0 feet. Soil samples were collected at depth intervals of 0 to 0.5 foot, 1.0 to 1.5 feet, 2.5 to 3.0 feet, and 3.5 to 4.0 feet. Refusal was encountered in several borings which prohibited the collection of soil samples at depths ranging from 1.5 to 4 feet.

The sample locations were selected by the Caltrans TO Manager prior to the field sampling activities. Details of the field activities are presented in the following sections.

4.0 INVESTIGATIVE METHODS

4.1 Soil Sampling Procedures

Soil samples were transferred from the hand-auger to glass jars and field homogenized. The jars were subsequently labeled and placed in a cooler and transported to ATL for chemical analyses under chain-of-custody (COC) procedures. Following sample collection, the borings were backfilled with excess soil cuttings and surrounding soil. General soil types were recorded on the daily field log.

The coordinates of the boring locations were determined using a portable global positioning system (GPS). The latitude and longitude of the boring locations are summarized in Table 1.

4.2 Quality Assurance/Quality Control Procedures

QA/QC procedures were performed during the field exploration activities. These procedures included the decontamination of sampling equipment prior to and between each boring and providing COC documentation for each sample submitted to the laboratory. The soil sampling equipment was cleansed between borings by washing the equipment with a non-phosphate detergent (e.g. Alconox[®]) solution followed by a double rinse with distilled water. The decontamination water was discharged to the ground surface within the Caltrans ROW, away from the roadway and storm drain inlets.

4.3 Laboratory Analyses

The soil samples were analyzed under standard turnaround-time (TAT) for the following analyses. The laboratory was instructed to homogenize the soil samples prior to analysis in accordance with Contract 12A1535 requirements.

- Two-hundred-twenty-nine soil samples were analyzed for total lead following Environmental Protection Agency (EPA) Test Method 6010B.
- Nineteen soil samples with total lead concentrations greater than or equal to 50 mg/kg (i.e., ten times the lead STLC) were further analyzed for WET soluble lead using EPA Test Method 6010B.
- Twelve soil samples were further analyzed for WET soluble lead using deionized water as the extractant (DI-WET) following EPA Test Method 6010B.
- Twelve soil samples were further analyzed for TCLP soluble lead using EPA Test Method 6010B.
- Twelve soil samples were analyzed for soil pH using EPA Test Method 9045C.

QA/QC procedures were performed by ATL as applicable for the method of analysis with specificity for each analyte listed in the test method's QA/QC. QA/QC measures for the lead analysis included the following:

- One method blank for every ten samples, batch of samples or type of matrix, whichever was more frequent.

- One sample analyzed in duplicate for every ten samples, batch of samples or type of matrix, whichever was more frequent.
- One spiked sample for every ten samples, batch of samples or type of matrix, whichever was more frequent, with the spike made at ten times the detection limit or at the analyte level.

Prior to submitting the samples to the laboratory, the COC documentation was reviewed for accuracy and completeness. Copies of the laboratory reports and COC documentation are in Appendix B.

4.4 Deviations from Workplan

The TO served as the workplan for this investigation. Geocon performed the scope of work as described in the TO with the exceptions of the following:

- Borings could not be advanced at B7 and B58 since these locations are paved; thus no soil samples were collected at these boring locations.
- Twelve borings could not be advanced to the planned depth of 4.0 feet due to adverse soil conditions. Refusal was encountered at approximate depths between 1.5 and 3.0 feet. The sample depth intervals are shown on Table 1.

5.0 FIELD OBSERVATIONS AND INVESTIGATIVE RESULTS

5.1 Soil Description

Soil encountered in the borings during the field sampling activities generally consisted of very dark grey to dark brown clay and dark grey silty sand with some gravel and cobble to the maximum sampling depth of approximately 4.0 feet. Groundwater was not encountered in the borings.

5.2 Soil Analytical Results

A summary of soil analytical results is presented on Table 1. Copies of the laboratory reports and COC documentation are in Appendix B.

Soil sample analytical results are summarized below. Some results were J-flagged for analytes detected between the practical quantitation limit (PQL) and the calculated method detection limit (MDL). Results that are J-flagged are considered estimated values since it becomes difficult to accurately quantitate the analyte near the MDL.

- Total lead was detected in the 229 soil samples analyzed at concentrations ranging from 0.27 J to 310 mg/kg. Nineteen of the 229 soil samples had reported total lead concentrations greater than or equal 50 mg/kg (i.e., ten times the STLC for lead of 5.0 mg/l) and were further analyzed for WET soluble lead.
- WET soluble lead was detected in the 19 samples analyzed at concentrations ranging from 1.2 to 16 mg/l. Twelve of the 19 samples with reported WET soluble lead concentrations greater than the lead STLC of 5.0 mg/l were further analyzed for DI-WET soluble lead, TCLP soluble lead, and pH.

- DI-WET soluble lead was reported for four of the twelve samples analyzed at concentrations ranging from 0.11 J to 1.7 mg/l.
- TCLP soluble lead was reported for the twelve samples analyzed at concentrations ranging from 0.0083 J to 0.68 mg/l.
- Soil pH for the twelve soil samples analyzed ranged from 6.6 to 9.3.

5.3 Laboratory QA/QC

We reviewed the QA/QC provided with the ATL laboratory report. The relative percent differences for some sample duplicates were outside acceptance criteria. Calculation is based on raw values as noted in the laboratory report. Matrix spike recovery was outside acceptance criteria. The analytical batch was validated by the laboratory control sample. Five soil samples were analyzed for pH past holding time as noted in the laboratory report. Based on the laboratory QA/QC data, no qualification of the data presented herein is necessary, and the data are of sufficient quality for the purposes of this report.

5.4 Statistical Evaluation for Lead Detected in Soil Samples

Statistical methods were applied to the total lead data to evaluate: 1) the UCLs of the arithmetic means of the total lead concentrations for each sampling depth; and 2) if an acceptable correlation between total and WET lead concentrations exists that would allow the prediction of WET lead concentrations based on the calculated UCLs. The total lead data were separated into six sample populations for statistical evaluation as described below.

- **Median** consists of borings B1 to B6, B8 to B27, B29 to B33, B35 to B38, and B42 advanced along the I-405 median;
- **Overhead (OH) Sign Structure/Panel** consists of boring B28 advanced at the SB I-405 offramp at University Drive;
- **SB Shoulders** consists of borings B34, B39 to B41, and B43 to B48 advanced along the SB I-405 shoulders;
- **Culver Drive SB Loop Onramp, Offramp, Shoulders** consists of borings B49 to B53, B56, B57, B59, and B60 advanced along the SB I-405 loop onramp, offramp, and shoulder at Culver Drive;
- **Culver Drive SB Slip Onramp** consists of borings B54 and B55 advanced along the SB I-405 slip onramp at Culver Drive; and
- **University Drive SB Onramp** consists of borings B61 to B65 advanced along the SB I-405 onramp at University Drive.

5.4.1 Calculating the UCLs for the Arithmetic Mean

The upper one-sided 90% and 95% UCLs of the arithmetic mean are defined as the values that, when calculated repeatedly for randomly drawn subsets of site data, equal or exceed the true mean 90% and 95% of the time, respectively. Statistical confidence limits are the classical tool for addressing uncertainties of a distribution mean. The UCLs of the arithmetic mean concentration are used as mean concentrations because it is not possible to know the true mean due to the essentially infinite number of soil samples that could be collected from a site. The UCLs therefore account for uncertainties due to limited sampling data. As data become less limited at a site, uncertainties decrease, and the UCLs move closer to the true mean.

Non-parametric bootstrap techniques were used to calculate the UCLs. For those samples in which total lead was not detected at concentrations exceeding the laboratory reporting limit (RL), a value equal to one-half of the RL was used in the UCL calculation. The bootstrap results are in Appendix C. The calculated UCLs and statistical results are summarized in the following tables:

Median

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0 to 0.5	35.8	37.4	30.5	3.2	150
1.0 to 1.5	28.7	30.7	22.1	1.5	190
2.5 to 3.0	7.8	8.3	6.1	1.3	32
3.5 to 4.0	6.1	6.5	4.8	1.4	22

SB Shoulders

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0 to 0.5	90.1	96.6	65.8	5.6	210
1.0 to 1.5	4.5	4.7	3.7	0.72	7.1
2.5 to 3.0	3.6	3.7	3.1	0.86	4.9
3.5 to 4.0	3.3	3.5	2.9	1.6	5.3

Culver Drive SB Loop Onramp, Offramp, Shoulders

SAMPLE INTERVAL (feet)	90% TOTAL LEAD UCL (mg/kg)	95% TOTAL LEAD UCL (mg/kg)	TOTAL LEAD MEAN (mg/kg)	MINIMUM VALUE (mg/kg)	MAXIMUM VALUE (mg/kg)
0 to 0.5	177.5	190.1	141.1	24	310
1.0 to 1.5	9.8	10.8	6.9	1.4	24
2.5 to 3.0	4.3	4.5	3.4	0.9	8.5
3.5 to 4.0	5.4	5.8	4.0	0.27	12

Total lead UCLs could not be calculated for lead data for the OH Sign Structure/Panel and Culver Drive SB Slip Onramp since there are insufficient amount of lead data for these sample populations. Statistical analysis was not performed for lead data for the University Drive SB Onramp since the total lead concentrations are less than 50 mg/kg (i.e., less than ten times the STLC for lead of 5.0 mg/l).

5.4.2 Correlation of Total and Soluble Lead

Total and corresponding soluble lead concentrations are bivariate data with a linear structure. This linear structure should allow for the prediction of soluble lead concentrations based on the UCLs calculated above in Section 5.4.1.

To estimate the degree of interrelation between total and corresponding WET soluble lead values (x and y , respectively), the *correlation coefficient* [r] is used. The correlation coefficient is a ratio that ranges from +1 to -1. A *correlation coefficient* of +1 indicates a perfect direct relationship between two variables; a *correlation coefficient* of -1 indicates that one variable changes inversely with relation to the other. Between the two extremes is a spectrum of less-than-perfect relationships, including zero, which indicates the lack of any sort of linear relationship at all.

The *correlation coefficient* calculated for the (x , y) data points (i.e., soil samples analyzed for both total lead [x] and WET soluble lead [y]) was 0.8. A *correlation coefficient* greater than or equal to 0.8 is an acceptable indicator that a correlation exists. To achieve an acceptable correlation for the data population, the total and WET soluble lead data for sample B-40-0.0 (100, 12) were excluded from the regression analysis. The excluded total and WET soluble lead data have the highest squared residual WET soluble lead value (Appendix C). Consequently, excluding this data point from the regression yields an acceptable *correlation coefficient* of 0.8.

For the *correlation coefficient* that indicates a linear relationship between total and WET soluble lead concentrations, it is possible to compute the line of dependence or a best-fit line between the two variables. A least squares method was used to find the equation of a best-fit line (regression line) by forcing the y -intercept equal to zero since that is a known point. The equation of the regression line was determined to be $y = 0.0461(x)$, where x represents total lead concentrations and y represents predicted WET soluble lead concentrations.

This equation was used to estimate the expected WET lead concentrations for the total lead UCLs for the data set (Section 5.4.1). Regression analysis results and a scatter plot depicting the (x , y) data points along with the regression line are included in Appendix C. The 90% and 95% UCL-predicted WET soluble lead concentrations are presented in Section 6.0.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Hazardous waste classification based on the 90% UCL is considered sufficient to satisfy a good faith effort as discussed in SW-846. Risk assessment characterization is typically based on the 95% UCL in accordance with the Risk Assessment Guidance for Superfund (RAGS) Volume 1 Documentation for Exposure Assessment. Per Caltrans, 90% UCLs are to be used to evaluate onsite reuse, and 95% UCLs are to be used to evaluate offsite reuse or disposal.

Based on the TCLP soluble lead results of less than 5.0 mg/l, soil generated within the project locations will not be classified as RCRA hazardous waste. If soil within the project limits is scarified in-place, moisture-conditioned, and recompacted during roadway improvement activities, it may not be considered a 'waste.'

It is our understanding that the design for this project requires excavations to a depth of 4.0 feet. Based on the results of this investigation, if excavations within the project limit extend to 4.0 feet, and the soil is managed as a whole, then the soil would be suitable for reuse on site without restriction (Caltrans Type X). If excavation will not extend to the total depth of 4.0 feet then the excavations should be planned in accordance with the area specific excavation scenarios presented below. If the soil is to be disposed of offsite it should be performed in accordance with SSP 7-1.02K.

6.1 Median

Soil excavated from the surface to a depth of 4.0 feet or shallower would not be classified as a California hazardous waste since the calculated total lead 90% and 95% UCLs are less than 50 mg/kg (i.e., less than ten times the STLC for lead of 5.0 mg/l). Thus, soil excavated from the surface to a depth of 0.5 foot or deeper along the median as represented by borings B1 to B6, B8 to B27, B29 to B33, B35 to B38, and B42 can be reused onsite or disposed of as non-hazardous soil with respect to lead content (Caltrans Type X).

6.2 OH Sign Structure/Panel at the SB University Drive Offramp – B28

The table below summarizes the excavation scenarios, the weighted average based on the maximum laboratory reported total lead concentration, the predicted WET soluble lead concentrations, and the waste classification for excavated soil at location represented by borings B28.

Excavation Depth	Total Lead (mg/kg)	Predicted WET Lead (mg/l)	Waste Classification
0.0 to 0.5 foot	100	7.9 ⁽¹⁾	Hazardous
Underlying Soil (0.5 to 4.0 feet)	19.4	0.9	Non-hazardous
0.0 to 1.0 foot	100	7.9 ⁽¹⁾	Hazardous
Underlying Soil (1.0 to 4.0 feet)	5.9	0.3	Non-hazardous
0.0 to 1.5 feet	68.5	3.2	Non-hazardous
Underlying Soil (1.5 to 4.0 feet)	6.0	0.3	Non-hazardous
0.0 to 2.0 feet	52.7	2.4	Non-hazardous
Underlying Soil (2.0 to 4.0 feet)	6.2	0.3	Non-hazardous
0.0 to 2.5 feet	43.2	2.0	Non-hazardous
Underlying Soil (2.5 to 4.0 feet)	6.5	0.3	Non-hazardous
0.0 to 3.0 feet	37.4	1.7	Non-hazardous
Underlying Soil (3.0 to 4.0 feet)	5.6	0.3	Non-hazardous
0.0 to 3.5 feet	33.3	1.5	Non-hazardous
Underlying Soil (3.5 to 4.0 feet)	2.8	0.1	Non-hazardous
0.0 to 4.0 feet	29.5	1.4	Non-hazardous

(1) Concentration shown for 0.0 to 1.0 foot sample is laboratory reported WET concentration. Predicted WET soluble lead was calculated using the equation of the regression line: $y = 0.0461x$

Soil excavated from the surface to a depth of 1.0 foot at a location represented by boring B28 would be classified as a California hazardous waste since the WET soluble lead concentration is greater than the lead STLC of 5.0 mg/l. Soil excavated from the top 1.0 foot may be reused onsite in accordance with the DTSC Variance (as Caltrans Type Y1 material) and shall be placed a minimum of 5 feet above groundwater elevation and must be covered with at least one foot of non-hazardous soil or pavement structure since the DI-WET soluble lead level is less than 1.5 mg/l and the pH value is greater than 5.5. If excavated soil from the top 1.0 foot will not be reused onsite, then the excavated soil should be either (1) managed and disposed of as a California hazardous waste or (2) stockpiled and resampled to confirm waste classification in accordance with specific disposal facility acceptance criteria, if applicable.

Underlying soil (i.e., deeper than 1.0 foot) would not be classified as a California hazardous waste since the reported total lead concentrations are less than 50 mg/kg (i.e., less than ten times the lead STLC of 5.0 mg/l). Thus, soil excavated from a depth of 1.0 to 4.0 feet at this boring location can be reused onsite or disposed of as non-hazardous soil with respect to lead content.

If soil from the top 1.5 feet or deeper is excavated and managed as a whole, then soil generated from the top 1.5 feet or deeper would not be classified as a California hazardous waste since the 90% and 95% UCL-predicted WET soluble lead concentrations are less than the STLC for lead of 5.0 mg/l. Consequently, excavated soil from the top 1.5 feet or deeper can be reused or disposed of as non-hazardous soil with respect to lead content (Caltrans Type X).

6.3 Southbound Shoulder

The table below summarizes the excavation scenarios, the weighted average based on the calculated total lead UCLs, the predicted WET soluble lead concentrations, and the waste classification for excavated soil at locations represented by borings B34, B39 to B41, and B43 to B48.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	95% UCL Predicted WET Lead (mg/l)	Waste Classification
0.0 to 0.5 foot	90.1	4.2	96.6	4.5	Non-hazardous
Underlying Soil (0.5 to 4.0 feet)	16.3	0.8	17.4	0.8	Non-hazardous
0.0 to 1.0 foot	90.1	4.2	96.6	4.5	Non-hazardous
Underlying Soil (1.0 to 4.0 feet)	4.0	0.2	4.2	0.2	Non-hazardous
0.0 to 1.5 feet	61.6	2.8	66.0	3.0	Non-hazardous
Underlying Soil (1.5 to 4.0 feet)	3.9	0.2	4.1	0.2	Non-hazardous
0.0 to 2.0 feet	47.3	2.2	50.7	2.3	Non-hazardous
Underlying Soil (2.0 to 4.0 feet)	3.8	0.2	3.9	0.2	Non-hazardous
0.0 to 2.5 feet	38.7	1.8	41.5	1.9	Non-hazardous
Underlying Soil (2.5 to 4.0 feet)	3.5	0.2	3.6	0.2	Non-hazardous
0.0 to 3.0 feet	32.9	1.5	35.2	1.6	Non-hazardous
Underlying Soil (3.0 to 4.0 feet)	3.5	0.2	3.6	0.2	Non-hazardous
0.0 to 3.5 feet	28.7	1.3	30.7	1.4	Non-hazardous
Underlying Soil (3.5 to 4.0 feet)	3.3	0.2	3.5	0.2	Non-hazardous
0.0 to 4.0 feet	25.5	1.2	27.3	1.3	Non-hazardous

90% UCL applicable for waste classification and onsite reuse; 95% UCL applicable for risk assessment and offsite disposal.
 Predicted WET soluble lead was calculated using the equation of the regression line: $y = 0.0461x$

Based on the table above, soil excavated from the surface to a depth of 0.5 foot or deeper would not be classified as a California hazardous waste since the 90% and 95% UCL-predicted soluble (WET) lead concentrations are less than the STLC for lead of 5.0 mg/l. Consequently, soil excavated from the top 0.5 foot or deeper can be reused or disposed of as non-hazardous soil with respect to lead (Caltrans Type X).

6.4 Culver Drive SB Loop Onramp, Offramp, Shoulders

The table below summarizes the excavation scenarios, the weighted average based on the calculated total lead UCLs, the predicted WET soluble lead concentrations, and the waste classification for excavated soil at locations represented by borings B49 to B53, B56, B57, B59, and B60.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	95% UCL Predicted WET Lead (mg/l)	Waste Classification
0.0 to 0.5 foot	177.5	8.2	190.1	8.8	Hazardous
Underlying Soil (0.5 to 4.0 feet)	31.6	1.5	33.9	1.6	Non-hazardous
0.0 to 1.0 foot	177.5	8.2	190.1	8.8	Hazardous
Underlying Soil (1.0 to 4.0 feet)	7.2	0.3	7.9	0.4	Non-hazardous
0.0 to 1.5 feet	121.6	5.6	130.3	6.0	Hazardous
Underlying Soil (1.5 to 4.0 feet)	6.7	0.3	7.3	0.3	Non-hazardous
0.0 to 2.0 feet	93.7	4.3	100.5	4.6	Non-hazardous
Underlying Soil (2.0 to 4.0 feet)	6.0	0.3	6.4	0.3	Non-hazardous
0.0 to 2.5 feet	76.9	3.5	82.5	3.8	Non-hazardous
Underlying Soil (2.5 to 4.0 feet)	4.7	0.2	4.9	0.2	Non-hazardous
0.0 to 3.0 feet	64.8	3.0	69.5	3.2	Non-hazardous
Underlying Soil (3.0 to 4.0 feet)	4.9	0.2	5.2	0.2	Non-hazardous
0.0 to 3.5 feet	56.1	2.6	60.2	2.8	Non-hazardous
Underlying Soil (3.5 to 4.0 feet)	5.4	0.2	5.8	0.3	Non-hazardous
0.0 to 4.0 feet	49.8	2.3	53.4	2.5	Non-hazardous

90% UCL applicable for waste classification and onsite reuse; 95% UCL applicable for risk assessment and offsite disposal.
 Predicted WET soluble lead was calculated using the equation of the regression line: $y = 0.0461x$

Based on the table above, soil excavated from the surface to a depth of 1.5 feet or shallower would be classified as a California hazardous waste since the 90% UCL-predicted soluble (WET) lead concentrations are greater than the STLC for lead of 5.0 mg/l. Soil excavated from the top 1.5 feet or shallower may be reused onsite in accordance with the DTSC Variance (as Caltrans Type Y1 material) and shall be placed a minimum of 5 feet above groundwater elevation and must be covered with at least one foot of non-hazardous soil or pavement structure since the DI-WET soluble lead levels are less than 1.5 mg/l (except sample B-49-0.0) and the pH values are greater than 5.5. If excavated soil from the top 1.5 feet or shallower will not be reused onsite, then the excavated soil should be either (1) managed and disposed of as a California hazardous waste or (2) stockpiled and resampled to confirm waste classification in accordance with specific disposal facility acceptance criteria, if applicable.

Underlying soil (from 1.5 to a depth of 4.0 feet) where excavated separately would not be classified as a California hazardous waste.

If soil from the top 2.0 feet or deeper is excavated and managed as a whole, then soil generated from the top 2.0 feet or deeper would not be classified as a California hazardous waste since the 90% and 95% UCL-predicted WET soluble lead concentrations are less than the STLC for lead of 5.0 mg/l. Consequently, excavated soil from the top 2.0 feet or deeper can be reused or disposed of as non-hazardous soil with respect to lead content (Caltrans Type X).

6.5 Culver Drive SB Slip Onramp

The table below summarizes the excavation scenarios, the weighted average based on the maximum laboratory reported total lead concentration, the predicted WET soluble lead concentrations, and the waste classification for excavated soil at location represented by borings B54 and B55.

Excavation Depth	Total Lead (mg/kg)	Predicted WET Lead (mg/l)	Waste Classification
0.0 to 0.5 foot	80	5.0 ⁽¹⁾	Hazardous
Underlying Soil (0.5 to 4.0 feet)	16.7	0.8	Non-hazardous
0.0 to 1.0 foot	80	5.0 ⁽¹⁾	Hazardous
Underlying Soil (1.0 to 4.0 feet)	6.2	0.3	Non-hazardous
0.0 to 1.5 feet	56.1	2.6	Non-hazardous
Underlying Soil (1.5 to 4.0 feet)	5.8	0.3	Non-hazardous
0.0 to 2.0 feet	44.1	2.0	Non-hazardous
Underlying Soil (2.0 to 4.0 feet)	5.2	0.2	Non-hazardous
0.0 to 2.5 feet	36.9	1.7	Non-hazardous
Underlying Soil (2.5 to 4.0 feet)	4.1	0.2	Non-hazardous
0.0 to 3.0 feet	31.5	1.4	Non-hazardous
Underlying Soil (3.0 to 4.0 feet)	4.2	0.2	Non-hazardous
0.0 to 3.5 feet	27.5	1.3	Non-hazardous
Underlying Soil (3.5 to 4.0 feet)	4.2	0.2	Non-hazardous
0.0 to 4.0 feet	24.6	1.1	Non-hazardous

(1) Concentration shown for 0.0 to 1.0 foot sample is laboratory reported WET concentration. Predicted WET soluble lead was calculated using the equation of the regression line: $y = 0.0461x$

Soil excavated from the surface to a depth of 1.0 foot at locations represented by borings B54 and B55 would be classified as a California hazardous waste since the WET soluble lead concentration is greater than the lead STLC of 5.0 mg/l. Soil excavated from the top 1.0 foot may be reused onsite in accordance with the DTSC Variance (as Caltrans Type Y1 material) and shall be placed a minimum of 5 feet above groundwater elevation and must be covered with at least one foot of non-hazardous soil or pavement structure since the DI-WET soluble lead level is less than 1.5 mg/l and the pH value is greater than 5.5. If excavated soil from the top 1.0 foot will not be reused onsite, then the excavated soil should be either (1) managed and disposed of as a California hazardous waste or (2) stockpiled and resampled to confirm waste classification in accordance with specific disposal facility acceptance criteria, if applicable.

Underlying soil (i.e., deeper than 1.0 foot) would not be classified as a California hazardous waste since the reported total lead concentration is less than 50 mg/kg (i.e., less than ten times the lead STLC of 5.0 mg/l). Thus, soil excavated from a depth of 1.0 to 4.0 feet at these boring locations can be reused onsite or disposed of as non-hazardous soil with respect to lead content (Caltrans Type X).

If soil from the top 1.5 feet or deeper is excavated and managed as a whole, then soil generated from the top 1.5 feet or deeper would not be classified as a California hazardous waste since the predicted WET soluble lead concentrations are less than the STLC for lead of 5.0 mg/l. Consequently, excavated soil from the top 1.5 feet or deeper can be reused or disposed of as non-hazardous soil with respect to lead content (Caltrans Type X).

6.6 University Drive SB Onramp

Soil excavated from the surface to a depth of 0.5 foot or deeper at locations represented by borings B61 to B65 would not be classified as a California hazardous waste since the reported total lead concentrations are less than 50 mg/kg (i.e., less than ten times the STLC for lead of 5.0 mg/l). Thus, soil excavated from the surface to a depth of 0.5 foot or deeper at these locations can be reused onsite or disposed of as non-hazardous soil with respect to lead content (Caltrans Type X).

6.7 Worker Protection

Per Caltrans' requirements, the contractor(s) should prepare a project-specific Lead Compliance Plan (CCR Title 8, § 1532.1, the "Lead in Construction" standard) to minimize worker exposure to lead-impacted soil. The plan should include protocols for environmental and personnel monitoring, requirements for personal protective equipment, and other health and safety protocols and procedures for the handling of lead-impacted soil.

7.0 REPORT LIMITATIONS

This report has been prepared exclusively for Caltrans. The information contained herein is only valid as of the date of the report and will require an update to reflect additional information obtained.

This report is not a comprehensive site characterization and should not be construed as such. The findings as presented in this report are predicated on the results of the limited sampling and laboratory testing performed. In addition, the information obtained is not intended to address potential impacts related to sources other than those specified herein. Therefore, the report should be deemed conclusive with respect to only the information obtained. We make no warranty, express or implied, with respect to the content of this report or any subsequent reports, correspondence or consultation. We strived to perform the services summarized herein in accordance with the local standard of care in the geographic region at the time the services were rendered.



GEOCON
CONSULTANTS, INC.

3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA. 91504
PHONE 818.841.8388 - FAX 818.841.1704

Interstate 405 from Culver Dr. to Jeffrey Rd/University Dr.

Orange County,
California

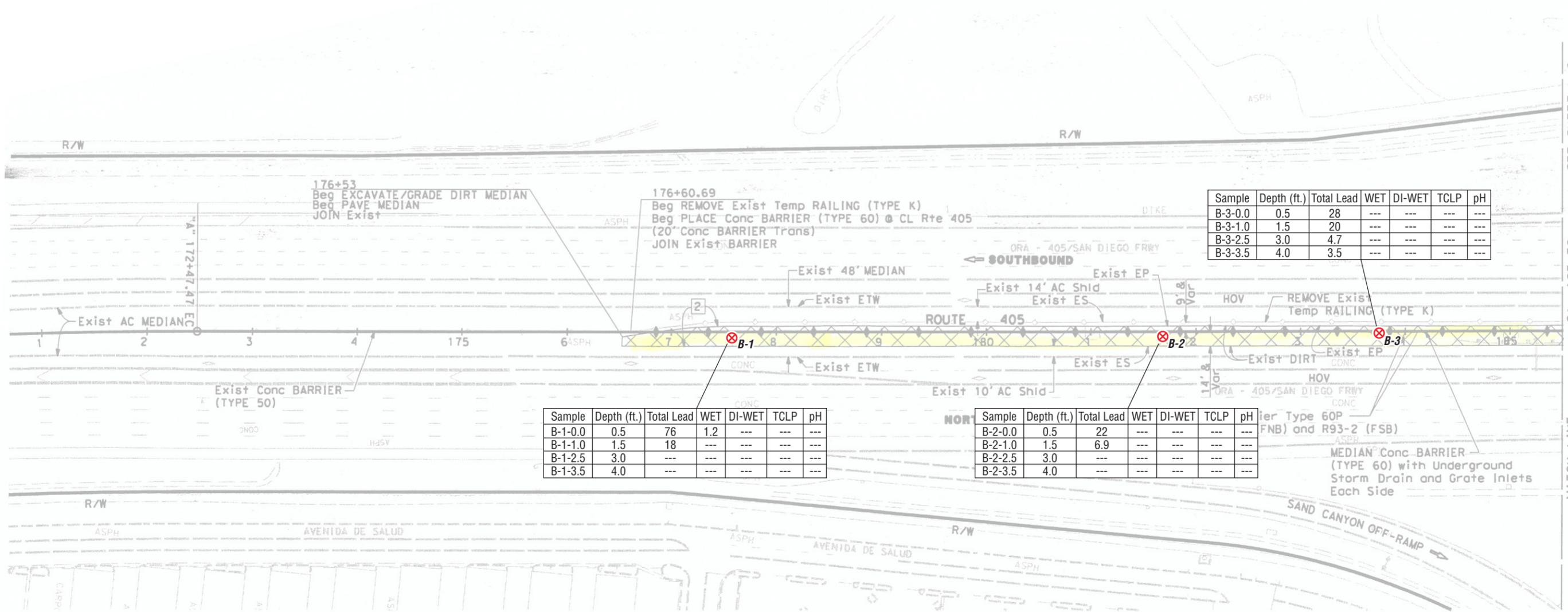
VICINITY MAP

GEOCON Proj. No. S9890-06-10

Task Order No. 12-0M3501-10

October 2015

Figure 1



Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-3-0.0	0.5	28	---	---	---	---
B-3-1.0	1.5	20	---	---	---	---
B-3-2.5	3.0	4.7	---	---	---	---
B-3-3.5	4.0	3.5	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-1-0.0	0.5	76	1.2	---	---	---
B-1-1.0	1.5	18	---	---	---	---
B-1-2.5	3.0	---	---	---	---	---
B-1-3.5	4.0	---	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-2-0.0	0.5	22	---	---	---	---
B-2-1.0	1.5	6.9	---	---	---	---
B-2-2.5	3.0	---	---	---	---	---
B-2-3.5	4.0	---	---	---	---	---

LEGEND:
 B-1 ⊗ Approximate Boring Location

Total Lead Concentrations in mg/kg
 WET Lead, DI-WET Lead and TCLP Concentrations in mg/l
 NS = Not sampled due to surface paving
 < = Not detected above laboratory reporting limit
 --- = Not Analyzed
 J = Result qualified as an estimated value due to analytical bias in precision or accuracy
 mg/kg = Milligram per kilogram
 mg/l = Milligram per liter

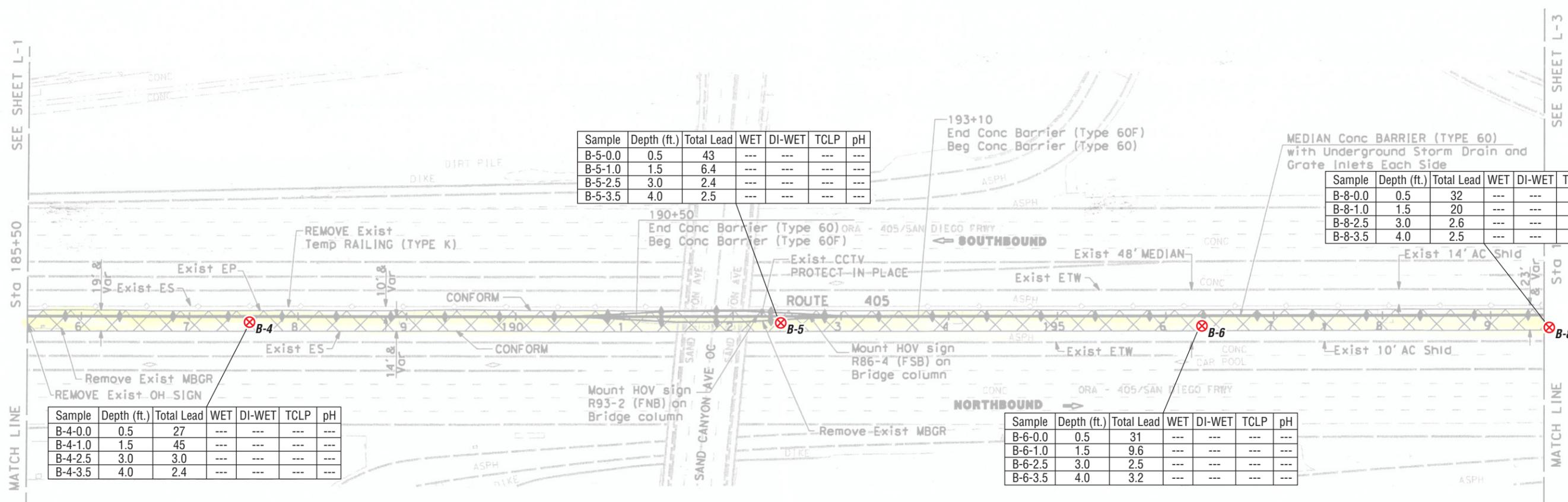
Sample	Depth (ft.)	Collection Range
B-1-0.0	0.5	collected from 0.0 to 0.5 ft.
B-1-1.0	1.5	collected from 1.0 to 1.5 ft.
B-1-2.5	3.0	collected from 2.5 to 3.0 ft.
B-1-3.5	4.0	collected from 3.5 to 4.0 ft.



GEOCON
CONSULTANTS, INC.
3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA. 91504
PHONE 818.841.8388 - FAX 818.841.1704

Interstate 405 from Culver Dr. to Jeffrey Rd/University Dr.

Orange County, California	SITE PLAN
GEOCON Proj. No. S9890-06-10	
Task Order No. 12-0M3501-10	October 2015 Figure 2-1



Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-5-0.0	0.5	43	---	---	---	---
B-5-1.0	1.5	6.4	---	---	---	---
B-5-2.5	3.0	2.4	---	---	---	---
B-5-3.5	4.0	2.5	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-8-0.0	0.5	32	---	---	---	---
B-8-1.0	1.5	20	---	---	---	---
B-8-2.5	3.0	2.6	---	---	---	---
B-8-3.5	4.0	2.5	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-4-0.0	0.5	27	---	---	---	---
B-4-1.0	1.5	45	---	---	---	---
B-4-2.5	3.0	3.0	---	---	---	---
B-4-3.5	4.0	2.4	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-6-0.0	0.5	31	---	---	---	---
B-6-1.0	1.5	9.6	---	---	---	---
B-6-2.5	3.0	2.5	---	---	---	---
B-6-3.5	4.0	3.2	---	---	---	---

LEGEND:

B-1 ⊗ Approximate Boring Location

Total Lead Concentrations in mg/kg
 WET Lead, DI-WET Lead and TCLP Concentrations in mg/l
 NS = Not sampled due to surface paving
 < = Not detected above laboratory reporting limit
 --- = Not Analyzed
 J = Result qualified as an estimated value due to analytical bias in precision or accuracy
 mg/kg = Milligram per kilogram
 mg/l = Milligram per liter

Sample	Depth (ft.)	Collection Range
B-1-0.0	0.5	collected from 0.0 to 0.5 ft.
B-1-1.0	1.5	collected from 1.0 to 1.5 ft.
B-1-2.5	3.0	collected from 2.5 to 3.0 ft.
B-1-3.5	4.0	collected from 3.5 to 4.0 ft.



GEOCON
 CONSULTANTS, INC.
 3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA. 91504
 PHONE 818.841.8388 - FAX 818.841.1704

Interstate 405 from Culver Dr. to Jeffrey Rd/University Dr.

Orange County, California

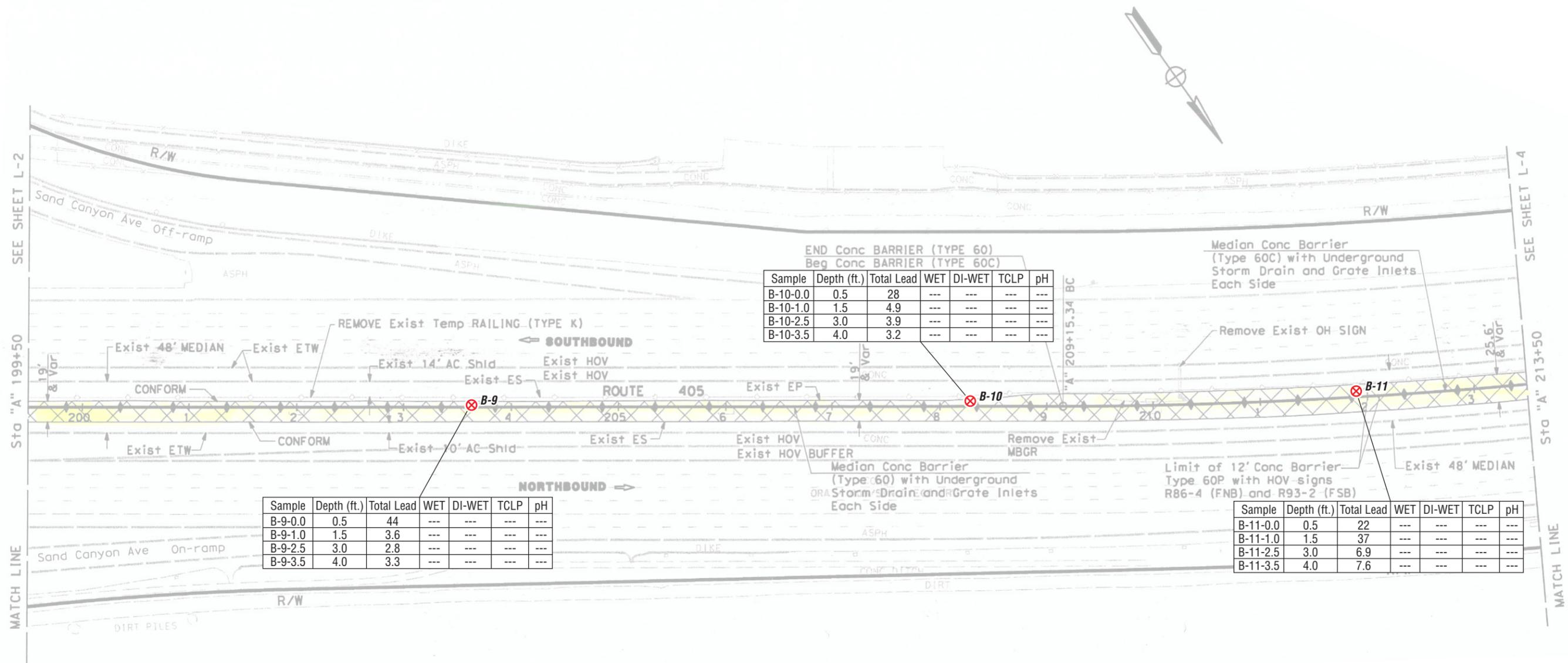
GEOCON Proj. No. S9890-06-10

Task Order No. 12-0M3501-10

SITE PLAN

October 2015

Figure 2-2



Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-10-0.0	0.5	28	---	---	---	---
B-10-1.0	1.5	4.9	---	---	---	---
B-10-2.5	3.0	3.9	---	---	---	---
B-10-3.5	4.0	3.2	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-9-0.0	0.5	44	---	---	---	---
B-9-1.0	1.5	3.6	---	---	---	---
B-9-2.5	3.0	2.8	---	---	---	---
B-9-3.5	4.0	3.3	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-11-0.0	0.5	22	---	---	---	---
B-11-1.0	1.5	37	---	---	---	---
B-11-2.5	3.0	6.9	---	---	---	---
B-11-3.5	4.0	7.6	---	---	---	---

LEGEND:

B-1 ⊗ Approximate Boring Location

Total Lead Concentrations in mg/kg
 WET Lead, DI-WET Lead and TCLP Concentrations in mg/l
 NS = Not sampled due to surface paving
 < = Not detected above laboratory reporting limit
 --- = Not Analyzed
 J = Result qualified as an estimated value due to analytical bias in precision or accuracy
 mg/kg = Milligram per kilogram
 mg/l = Milligram per liter

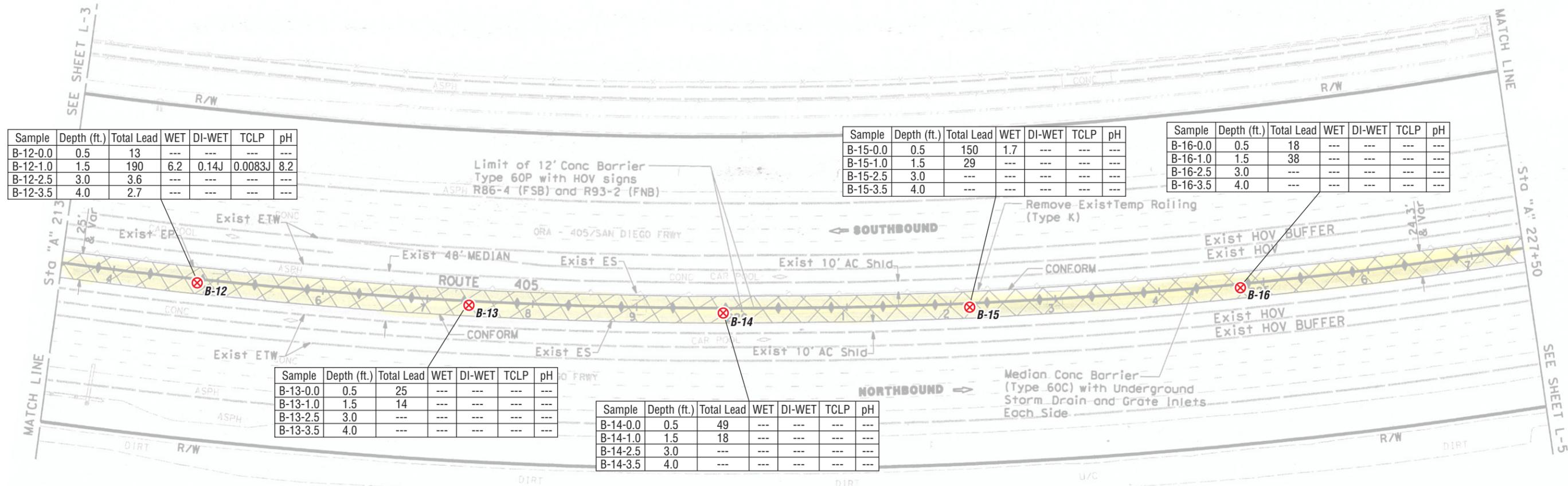
Sample	Depth (ft.)	Collection Interval
B-1-0.0	0.5	collected from 0.0 to 0.5 ft.
B-1-1.0	1.5	collected from 1.0 to 1.5 ft.
B-1-2.5	3.0	collected from 2.5 to 3.0 ft.
B-1-3.5	4.0	collected from 3.5 to 4.0 ft.



GEOCON
 CONSULTANTS, INC.
 3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA. 91504
 PHONE 818.841.8388 - FAX 818.841.1704

Interstate 405 from Culver Dr. to Jeffrey Rd/University Dr.

Orange County, California	SITE PLAN
GEOCON Proj. No. S9890-06-10	
Task Order No. 12-0M3501-10	October 2015



Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-12-0.0	0.5	13	---	---	---	---
B-12-1.0	1.5	190	6.2	0.14J	0.0083J	8.2
B-12-2.5	3.0	3.6	---	---	---	---
B-12-3.5	4.0	2.7	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-15-0.0	0.5	150	1.7	---	---	---
B-15-1.0	1.5	29	---	---	---	---
B-15-2.5	3.0	---	---	---	---	---
B-15-3.5	4.0	---	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-16-0.0	0.5	18	---	---	---	---
B-16-1.0	1.5	38	---	---	---	---
B-16-2.5	3.0	---	---	---	---	---
B-16-3.5	4.0	---	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-13-0.0	0.5	25	---	---	---	---
B-13-1.0	1.5	14	---	---	---	---
B-13-2.5	3.0	---	---	---	---	---
B-13-3.5	4.0	---	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-14-0.0	0.5	49	---	---	---	---
B-14-1.0	1.5	18	---	---	---	---
B-14-2.5	3.0	---	---	---	---	---
B-14-3.5	4.0	---	---	---	---	---

LEGEND:
 B-1 ⊗ Approximate Boring Location

Total Lead Concentrations in mg/kg
 WET Lead, DI-WET Lead and TCLP Concentrations in mg/l
 NS = Not sampled due to surface paving
 < = Not detected above laboratory reporting limit
 --- = Not Analyzed
 J = Result qualified as an estimated value due to analytical bias in precision or accuracy
 mg/kg = Milligram per kilogram
 mg/l = Milligram per liter

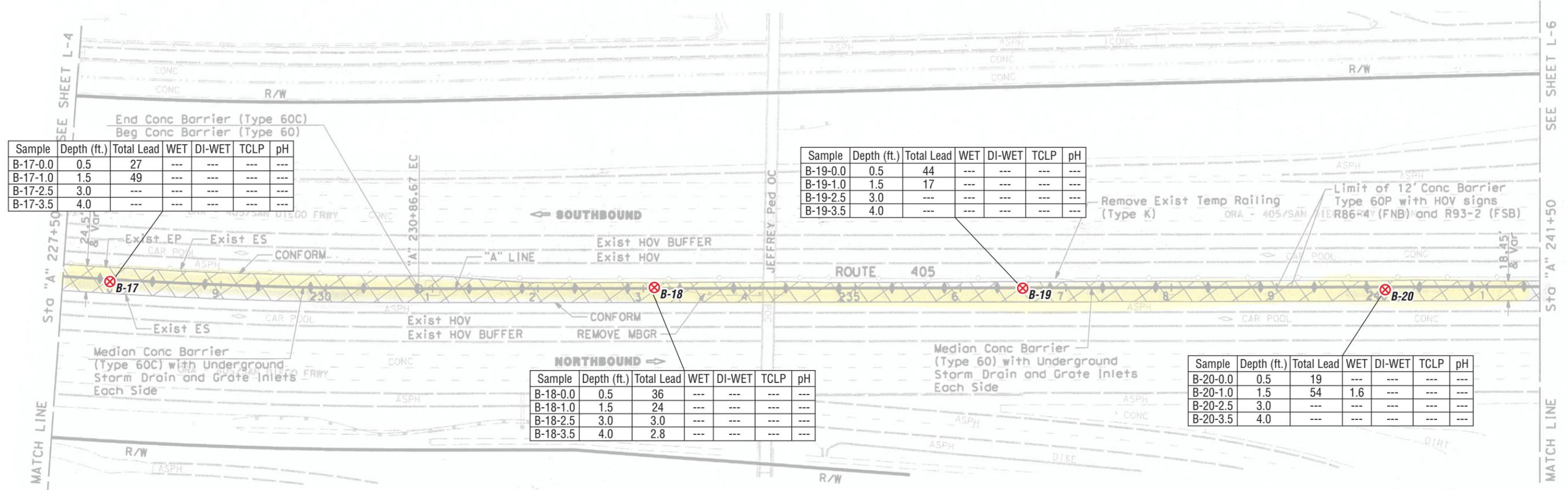
Sample	Depth (ft.)	Collection Method
B-1-0.0	0.5	collected from 0.0 to 0.5 ft.
B-1-1.0	1.5	collected from 1.0 to 1.5 ft.
B-1-2.5	3.0	collected from 2.5 to 3.0 ft.
B-1-3.5	4.0	collected from 3.5 to 4.0 ft.



GEOCON
 CONSULTANTS, INC.
 3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA. 91504
 PHONE 818.841.8388 - FAX 818.841.1704

Interstate 405 from Culver Dr. to Jeffrey Rd/University Dr.
 Orange County, California
 GEOCON Proj. No. S9890-06-10
 Task Order No. 12-0M3501-10

SITE PLAN
 October 2015
 Figure 2-4



LEGEND:

B-1 ⊗ Approximate Boring Location

Total Lead Concentrations in mg/kg
 WET Lead, DI-WET Lead and TCLP Concentrations in mg/l
 NS = Not sampled due to surface paving
 < = Not detected above laboratory reporting limit
 --- = Not Analyzed
 J = Result qualified as an estimated value due to analytical bias in precision or accuracy
 mg/kg = Milligram per kilogram
 mg/l = Milligram per liter

Sample	Depth (ft.)	Collection Range
B-1-0.0	0.5	collected from 0.0 to 0.5 ft.
B-1-1.0	1.5	collected from 1.0 to 1.5 ft.
B-1-2.5	3.0	collected from 2.5 to 3.0 ft.
B-1-3.5	4.0	collected from 3.5 to 4.0 ft.



Interstate 405 from Culver Dr. to Jeffrey Rd/University Dr.	
Orange County, California	SITE PLAN
GEOCON Proj. No. S9890-06-10	
Task Order No. 12-0M3501-10	October 2015 Figure 2-5

SEE SHEET L-5
MATCH LINE
Sta "A" 241+50

SEE SHEET L-7
MATCH LINE
Sta "A" 255+50

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-21-0.0	0.5	20	---	---	---	---
B-21-1.0	1.5	42	---	---	---	---
B-21-2.5	3.0	---	---	---	---	---
B-21-3.5	4.0	---	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-23-0.0	0.5	20	---	---	---	---
B-23-1.0	1.5	10	---	---	---	---
B-23-2.5	3.0	7.6	---	---	---	---
B-23-3.5	4.0	2.8	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-22-0.0	0.5	11	---	---	---	---
B-22-1.0	1.5	19	---	---	---	---
B-22-2.5	3.0	32	---	---	---	---
B-22-3.5	4.0	22	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-24-0.0	0.5	16	---	---	---	---
B-24-1.0	1.5	13	---	---	---	---
B-24-2.5	3.0	11	---	---	---	---
B-24-3.5	4.0	10	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-65-0.0	0.5	7.6	---	---	---	---
B-65-1.0	1.5	1.0	---	---	---	---
B-65-2.5	3.0	1.6	---	---	---	---
B-65-3.5	4.0	3.5	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-64-0.0	0.5	4.8	---	---	---	---
B-64-1.0	1.5	3.6	---	---	---	---
B-64-2.5	3.0	3.6	---	---	---	---
B-64-3.5	4.0	2.9	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-63-0.0	0.5	8.6	---	---	---	---
B-63-1.0	1.5	3.2	---	---	---	---
B-63-2.5	3.0	4.5	---	---	---	---
B-63-3.5	4.0	4.6	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-62-0.0	0.5	21	---	---	---	---
B-62-1.0	1.5	2.9	---	---	---	---
B-62-2.5	3.0	2.5	---	---	---	---
B-62-3.5	4.0	2.6	---	---	---	---

LEGEND:

B-1 ⊗ Approximate Boring Location

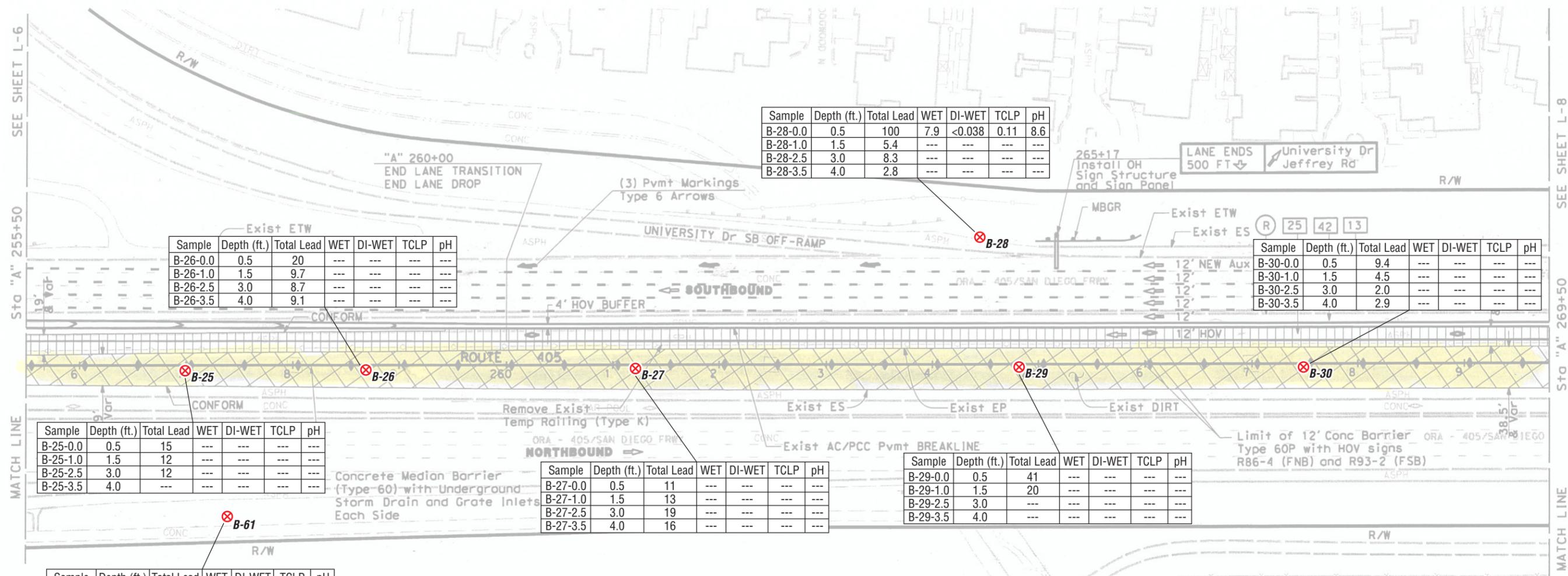
Total Lead Concentrations in mg/kg
 WET Lead, DI-WET Lead and TCLP Concentrations in mg/l
 NS = Not sampled due to surface paving
 < = Not detected above laboratory reporting limit
 --- = Not Analyzed
 J = Result qualified as an estimated value due to analytical bias in precision or accuracy
 mg/kg = Milligram per kilogram
 mg/l = Milligram per liter

Sample	Depth (ft.)	Collection Interval
B-1-0.0	0.5	collected from 0.0 to 0.5 ft.
B-1-1.0	1.5	collected from 1.0 to 1.5 ft.
B-1-2.5	3.0	collected from 2.5 to 3.0 ft.
B-1-3.5	4.0	collected from 3.5 to 4.0 ft.



GEOCON
 CONSULTANTS, INC.
 3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA. 91504
 PHONE 818.841.8388 - FAX 818.841.1704

Interstate 405 from Culver Dr. to Jeffrey Rd/University Dr.	
Orange County, California	SITE PLAN
GEOCON Proj. No. S9890-06-10	
Task Order No. 12-0M3501-10	October 2015 Figure 2-6



Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-28-0.0	0.5	100	7.9	<0.038	0.11	8.6
B-28-1.0	1.5	5.4	---	---	---	---
B-28-2.5	3.0	8.3	---	---	---	---
B-28-3.5	4.0	2.8	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-26-0.0	0.5	20	---	---	---	---
B-26-1.0	1.5	9.7	---	---	---	---
B-26-2.5	3.0	8.7	---	---	---	---
B-26-3.5	4.0	9.1	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-30-0.0	0.5	9.4	---	---	---	---
B-30-1.0	1.5	4.5	---	---	---	---
B-30-2.5	3.0	2.0	---	---	---	---
B-30-3.5	4.0	2.9	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-25-0.0	0.5	15	---	---	---	---
B-25-1.0	1.5	12	---	---	---	---
B-25-2.5	3.0	12	---	---	---	---
B-25-3.5	4.0	---	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-27-0.0	0.5	11	---	---	---	---
B-27-1.0	1.5	13	---	---	---	---
B-27-2.5	3.0	19	---	---	---	---
B-27-3.5	4.0	16	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-29-0.0	0.5	41	---	---	---	---
B-29-1.0	1.5	20	---	---	---	---
B-29-2.5	3.0	---	---	---	---	---
B-29-3.5	4.0	---	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-61-0.0	0.5	12	---	---	---	---
B-61-1.0	1.5	3.4	---	---	---	---
B-61-2.5	3.0	2.7	---	---	---	---
B-61-3.5	4.0	1.9	---	---	---	---

LEGEND:

B-1 ⊗ Approximate Boring Location

Total Lead Concentrations in mg/kg
 WET Lead, DI-WET Lead and TCLP Concentrations in mg/l
 NS = Not sampled due to surface paving
 < = Not detected above laboratory reporting limit
 --- = Not Analyzed
 J = Result qualified as an estimated value due to analytical bias in precision or accuracy
 mg/kg = Milligram per kilogram
 mg/l = Milligram per liter

Sample	Depth (ft.)	Collection Range
B-1-0.0	0.5	collected from 0.0 to 0.5 ft.
B-1-1.0	1.5	collected from 1.0 to 1.5 ft.
B-1-2.5	3.0	collected from 2.5 to 3.0 ft.
B-1-3.5	4.0	collected from 3.5 to 4.0 ft.



GEOCON
 CONSULTANTS, INC.
 3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA. 91504
 PHONE 818.841.8388 - FAX 818.841.1704

Interstate 405 from Culver Dr. to Jeffrey Rd/University Dr.
 Orange County, California
 GEOCON Proj. No. S9890-06-10
 Task Order No. 12-0M3501-10

SITE PLAN
 October 2015
 Figure 2-7

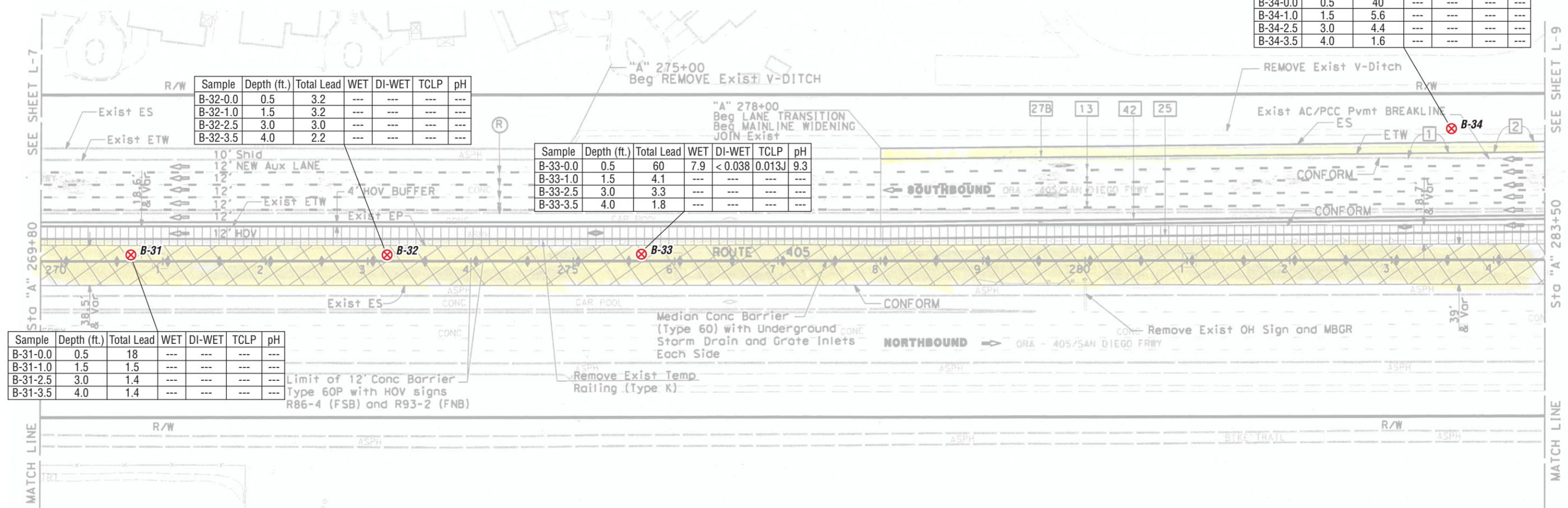


Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-34-0.0	0.5	40	---	---	---	---
B-34-1.0	1.5	5.6	---	---	---	---
B-34-2.5	3.0	4.4	---	---	---	---
B-34-3.5	4.0	1.6	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-32-0.0	0.5	3.2	---	---	---	---
B-32-1.0	1.5	3.2	---	---	---	---
B-32-2.5	3.0	3.0	---	---	---	---
B-32-3.5	4.0	2.2	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-33-0.0	0.5	60	7.9	< 0.038	0.013J	9.3
B-33-1.0	1.5	4.1	---	---	---	---
B-33-2.5	3.0	3.3	---	---	---	---
B-33-3.5	4.0	1.8	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-31-0.0	0.5	18	---	---	---	---
B-31-1.0	1.5	1.5	---	---	---	---
B-31-2.5	3.0	1.4	---	---	---	---
B-31-3.5	4.0	1.4	---	---	---	---



LEGEND:
 B-1 ⊗ Approximate Boring Location

Total Lead Concentrations in mg/kg
 WET Lead, DI-WET Lead and TCLP Concentrations in mg/l
 NS = Not sampled due to surface paving
 < = Not detected above laboratory reporting limit
 --- = Not Analyzed
 J = Result qualified as an estimated value due to analytical bias in precision or accuracy
 mg/kg = Milligram per kilogram
 mg/l = Milligram per liter

Sample	Depth (ft.)	Collection Method
B-1-0.0	0.5	collected from 0.0 to 0.5 ft.
B-1-1.0	1.5	collected from 1.0 to 1.5 ft.
B-1-2.5	3.0	collected from 2.5 to 3.0 ft.
B-1-3.5	4.0	collected from 3.5 to 4.0 ft.





3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA. 91504
 PHONE 818.841.8388 - FAX 818.841.1704

Interstate 405 from Culver Dr. to Jeffrey Rd/University Dr.

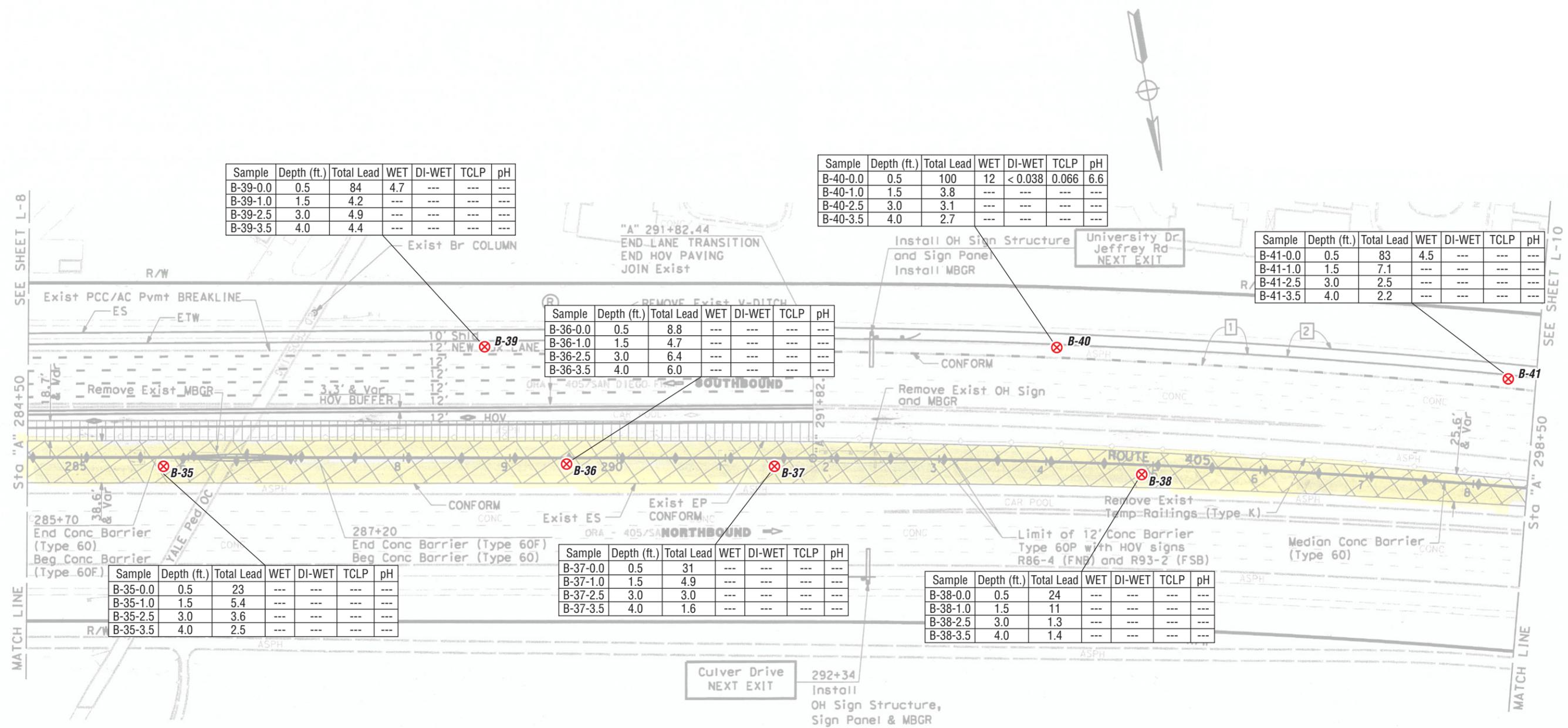
Orange County, California

GEOCON Proj. No. S9890-06-10

Task Order No. 12-0M3501-10

SITE PLAN

October 2015 Figure 2-8



Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-39-0.0	0.5	84	4.7	---	---	---
B-39-1.0	1.5	4.2	---	---	---	---
B-39-2.5	3.0	4.9	---	---	---	---
B-39-3.5	4.0	4.4	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-40-0.0	0.5	100	12	<0.038	0.066	6.6
B-40-1.0	1.5	3.8	---	---	---	---
B-40-2.5	3.0	3.1	---	---	---	---
B-40-3.5	4.0	2.7	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-41-0.0	0.5	83	4.5	---	---	---
B-41-1.0	1.5	7.1	---	---	---	---
B-41-2.5	3.0	2.5	---	---	---	---
B-41-3.5	4.0	2.2	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-36-0.0	0.5	8.8	---	---	---	---
B-36-1.0	1.5	4.7	---	---	---	---
B-36-2.5	3.0	6.4	---	---	---	---
B-36-3.5	4.0	6.0	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-35-0.0	0.5	23	---	---	---	---
B-35-1.0	1.5	5.4	---	---	---	---
B-35-2.5	3.0	3.6	---	---	---	---
B-35-3.5	4.0	2.5	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-37-0.0	0.5	31	---	---	---	---
B-37-1.0	1.5	4.9	---	---	---	---
B-37-2.5	3.0	3.0	---	---	---	---
B-37-3.5	4.0	1.6	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-38-0.0	0.5	24	---	---	---	---
B-38-1.0	1.5	11	---	---	---	---
B-38-2.5	3.0	1.3	---	---	---	---
B-38-3.5	4.0	1.4	---	---	---	---

LEGEND:

B-1 ⊗ Approximate Boring Location

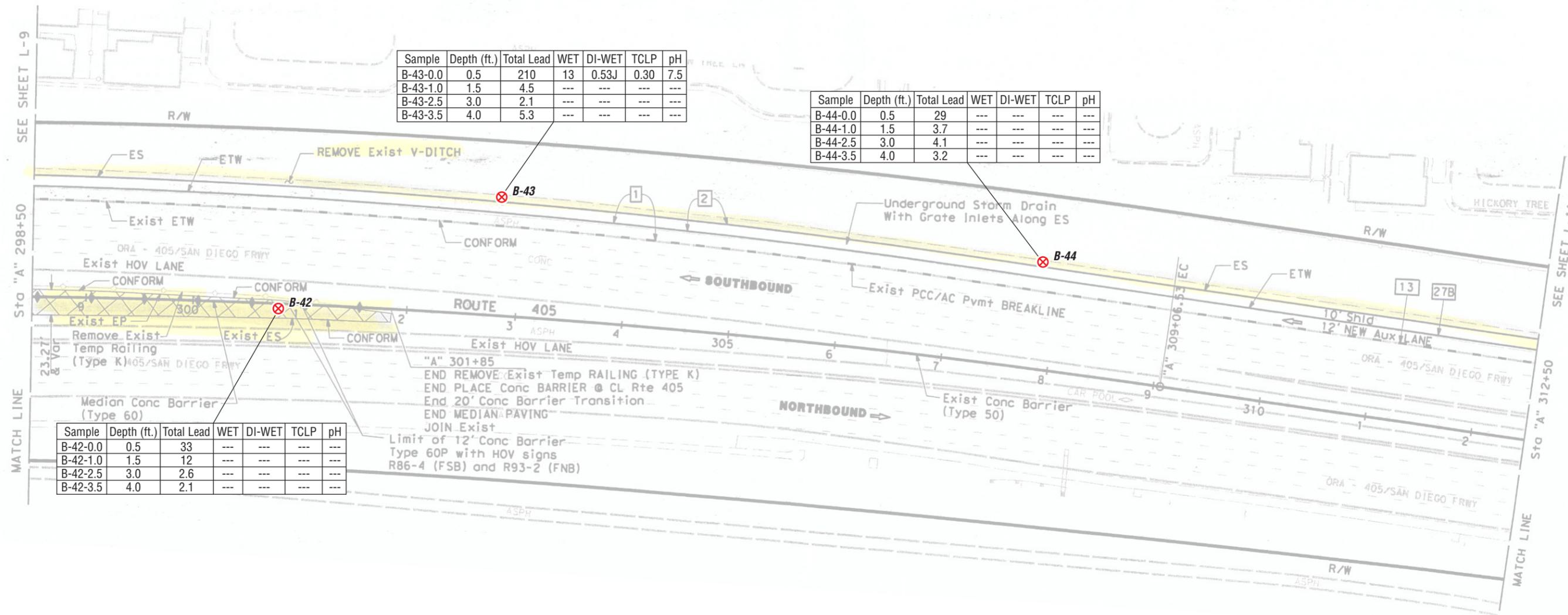
Total Lead Concentrations in mg/kg
 WET Lead, DI-WET Lead and TCLP Concentrations in mg/l
 NS = Not sampled due to surface paving
 < = Not detected above laboratory reporting limit
 --- = Not Analyzed
 J = Result qualified as an estimated value due to analytical bias in precision or accuracy
 mg/kg = Milligram per kilogram
 mg/l = Milligram per liter

Sample	Depth (ft.)	Collection Interval
B-1-0.0	0.5	collected from 0.0 to 0.5 ft.
B-1-1.0	1.5	collected from 1.0 to 1.5 ft.
B-1-2.5	3.0	collected from 2.5 to 3.0 ft.
B-1-3.5	4.0	collected from 3.5 to 4.0 ft.



GEOCON
 CONSULTANTS, INC.
 3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA. 91504
 PHONE 818.841.8388 - FAX 818.841.1704

Interstate 405 from Culver Dr. to Jeffrey Rd/University Dr.	
Orange County, California	SITE PLAN
GEOCON Proj. No. S9890-06-10	
Task Order No. 12-0M3501-10	October 2015
	Figure 2-9



Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-43-0.0	0.5	210	13	0.53J	0.30	7.5
B-43-1.0	1.5	4.5	---	---	---	---
B-43-2.5	3.0	2.1	---	---	---	---
B-43-3.5	4.0	5.3	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-44-0.0	0.5	29	---	---	---	---
B-44-1.0	1.5	3.7	---	---	---	---
B-44-2.5	3.0	4.1	---	---	---	---
B-44-3.5	4.0	3.2	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-42-0.0	0.5	33	---	---	---	---
B-42-1.0	1.5	12	---	---	---	---
B-42-2.5	3.0	2.6	---	---	---	---
B-42-3.5	4.0	2.1	---	---	---	---

LEGEND:

B-1 ⊗ Approximate Boring Location

Total Lead Concentrations in mg/kg
 WET Lead, DI-WET Lead and TCLP Concentrations in mg/l
 NS = Not sampled due to surface paving
 < = Not detected above laboratory reporting limit
 --- = Not Analyzed
 J = Result qualified as an estimated value due to analytical bias in precision or accuracy
 mg/kg = Milligram per kilogram
 mg/l = Milligram per liter

Sample	Depth (ft.)	Collected From
B-1-0.0	0.5	collected from 0.0 to 0.5 ft.
B-1-1.0	1.5	collected from 1.0 to 1.5 ft.
B-1-2.5	3.0	collected from 2.5 to 3.0 ft.
B-1-3.5	4.0	collected from 3.5 to 4.0 ft.



GEOCON
 CONSULTANTS, INC.
 3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA. 91504
 PHONE 818.841.8388 - FAX 818.841.1704

Interstate 405 from Culver Dr. to Jeffrey Rd/University Dr.	
Orange County, California	SITE PLAN
GEOCON Proj. No. S9890-06-10	
Task Order No. 12-0M3501-10	October 2015 Figure 2-10

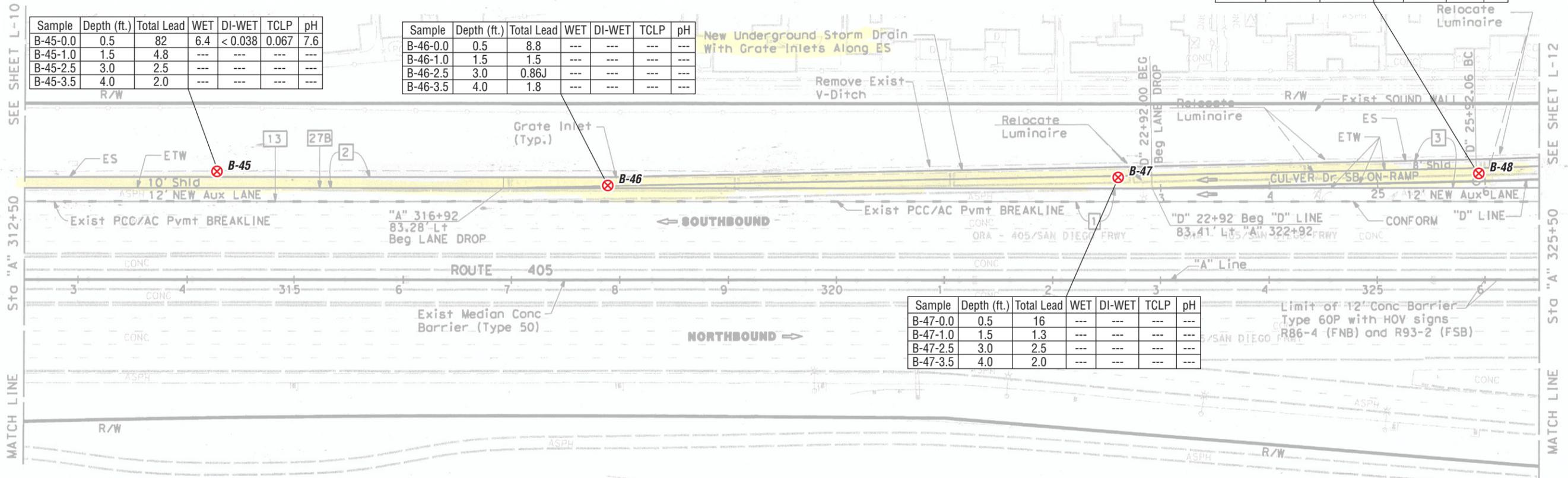


Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-48-0.0	0.5	5.6	---	---	---	---
B-48-1.0	1.5	0.72J	---	---	---	---
B-48-2.5	3.0	4.0	---	---	---	---
B-48-3.5	4.0	3.4	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-45-0.0	0.5	82	6.4	< 0.038	0.067	7.6
B-45-1.0	1.5	4.8	---	---	---	---
B-45-2.5	3.0	2.5	---	---	---	---
B-45-3.5	4.0	2.0	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-46-0.0	0.5	8.8	---	---	---	---
B-46-1.0	1.5	1.5	---	---	---	---
B-46-2.5	3.0	0.86J	---	---	---	---
B-46-3.5	4.0	1.8	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-47-0.0	0.5	16	---	---	---	---
B-47-1.0	1.5	1.3	---	---	---	---
B-47-2.5	3.0	2.5	---	---	---	---
B-47-3.5	4.0	2.0	---	---	---	---



LEGEND:

B-1 ⊗ Approximate Boring Location

Total Lead Concentrations in mg/kg
 WET Lead, DI-WET Lead and TCLP Concentrations in mg/l
 NS = Not sampled due to surface paving
 < = Not detected above laboratory reporting limit
 --- = Not Analyzed
 J = Result qualified as an estimated value due to analytical bias in precision or accuracy
 mg/kg = Milligram per kilogram
 mg/l = Milligram per liter

Sample	Depth (ft.)	Collection Range
B-1-0.0	0.5	collected from 0.0 to 0.5 ft.
B-1-1.0	1.5	collected from 1.0 to 1.5 ft.
B-1-2.5	3.0	collected from 2.5 to 3.0 ft.
B-1-3.5	4.0	collected from 3.5 to 4.0 ft.





3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA. 91504
 PHONE 818.841.8388 - FAX 818.841.1704

Interstate 405 from Culver Dr. to Jeffrey Rd/University Dr.

Orange County, California

GEOCON Proj. No. S9890-06-10

Task Order No. 12-0M3501-10

SITE PLAN

October 2015 Figure 2-11



Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-53-0.0	0.5	130	4.0	---	---	---
B-53-1.0	1.5	2.8	---	---	---	---
B-53-2.5	3.0	4.6	---	---	---	---
B-53-3.5	4.0	3.8	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-55-0.0	0.5	23	---	---	---	---
B-55-1.0	1.5	3.3	---	---	---	---
B-55-2.5	3.0	4.1	---	---	---	---
B-55-3.5	4.0	2.9	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-50-0.0	0.5	48	---	---	---	---
B-50-1.0	1.5	3.6	---	---	---	---
B-50-2.5	3.0	3.0	---	---	---	---
B-50-3.5	4.0	5.7	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-52-0.0	0.5	61	2.3	---	---	---
B-52-1.0	1.5	4.9	---	---	---	---
B-52-2.5	3.0	2.4	---	---	---	---
B-52-3.5	4.0	3.0	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-51-0.0	0.5	9.7	6.2	< 0.038	0.034J	7.9
B-51-1.0	1.5	4.0	---	---	---	---
B-51-2.5	3.0	3.1	---	---	---	---
B-51-3.5	4.0	4.5	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-54-0.0	0.5	80	5.0	0.11J	0.23	8.3
B-54-1.0	1.5	8.2	---	---	---	---
B-54-2.5	3.0	1.6	---	---	---	---
B-54-3.5	4.0	4.2	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-49-0.0	0.5	190	8.1	1.7	0.68	7.8
B-49-1.0	1.5	1.4	---	---	---	---
B-49-2.5	3.0	0.90J	---	---	---	---
B-49-3.5	4.0	0.27J	---	---	---	---

LEGEND:
 B-1 ⊗ Approximate Boring Location

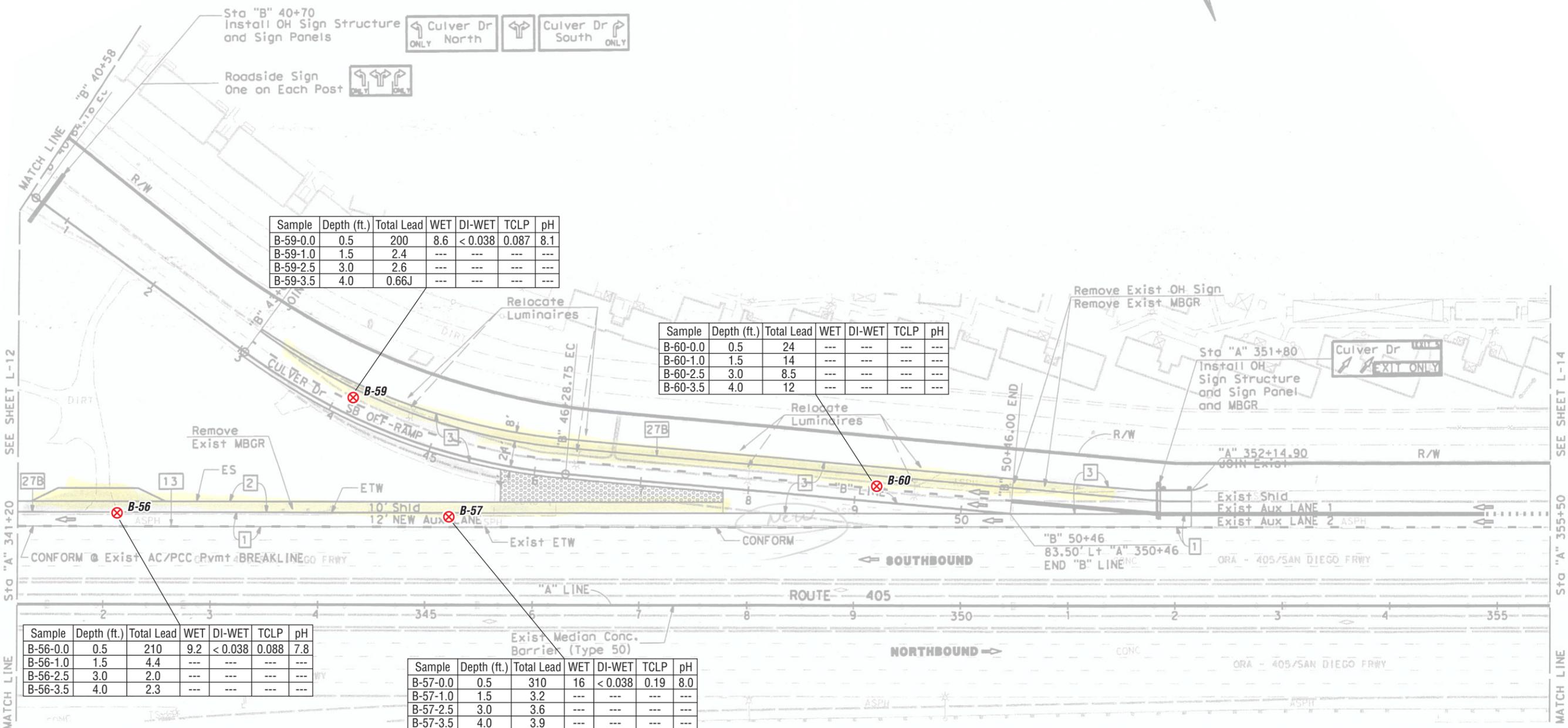
Total Lead Concentrations in mg/kg
 WET Lead, DI-WET Lead and TCLP Concentrations in mg/l
 NS = Not sampled due to surface paving
 < = Not detected above laboratory reporting limit
 --- = Not Analyzed
 J = Result qualified as an estimated value due to analytical bias in precision or accuracy
 mg/kg = Milligram per kilogram
 mg/l = Milligram per liter

Sample	Depth (ft.)	Collected From
B-1-0.0	0.5	collected from 0.0 to 0.5 ft.
B-1-1.0	1.5	collected from 1.0 to 1.5 ft.
B-1-2.5	3.0	collected from 2.5 to 3.0 ft.
B-1-3.5	4.0	collected from 3.5 to 4.0 ft.



GEOCON
 CONSULTANTS, INC.
 3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA. 91504
 PHONE 818.841.8388 - FAX 818.841.1704

Interstate 405 from Culver Dr. to Jeffrey Rd/University Dr.
 Orange County, California
 GEOCON Proj. No. S9890-06-10
 Task Order No. 12-0M3501-10
SITE PLAN
 October 2015
 Figure 2-12



Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-59-0.0	0.5	200	8.6	<0.038	0.087	8.1
B-59-1.0	1.5	2.4	---	---	---	---
B-59-2.5	3.0	2.6	---	---	---	---
B-59-3.5	4.0	0.66J	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-60-0.0	0.5	24	---	---	---	---
B-60-1.0	1.5	14	---	---	---	---
B-60-2.5	3.0	8.5	---	---	---	---
B-60-3.5	4.0	12	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-56-0.0	0.5	210	9.2	<0.038	0.088	7.8
B-56-1.0	1.5	4.4	---	---	---	---
B-56-2.5	3.0	2.0	---	---	---	---
B-56-3.5	4.0	2.3	---	---	---	---

Sample	Depth (ft.)	Total Lead	WET	DI-WET	TCLP	pH
B-57-0.0	0.5	310	16	<0.038	0.19	8.0
B-57-1.0	1.5	3.2	---	---	---	---
B-57-2.5	3.0	3.6	---	---	---	---
B-57-3.5	4.0	3.9	---	---	---	---

LEGEND:
 B-1 ⊗ Approximate Boring Location

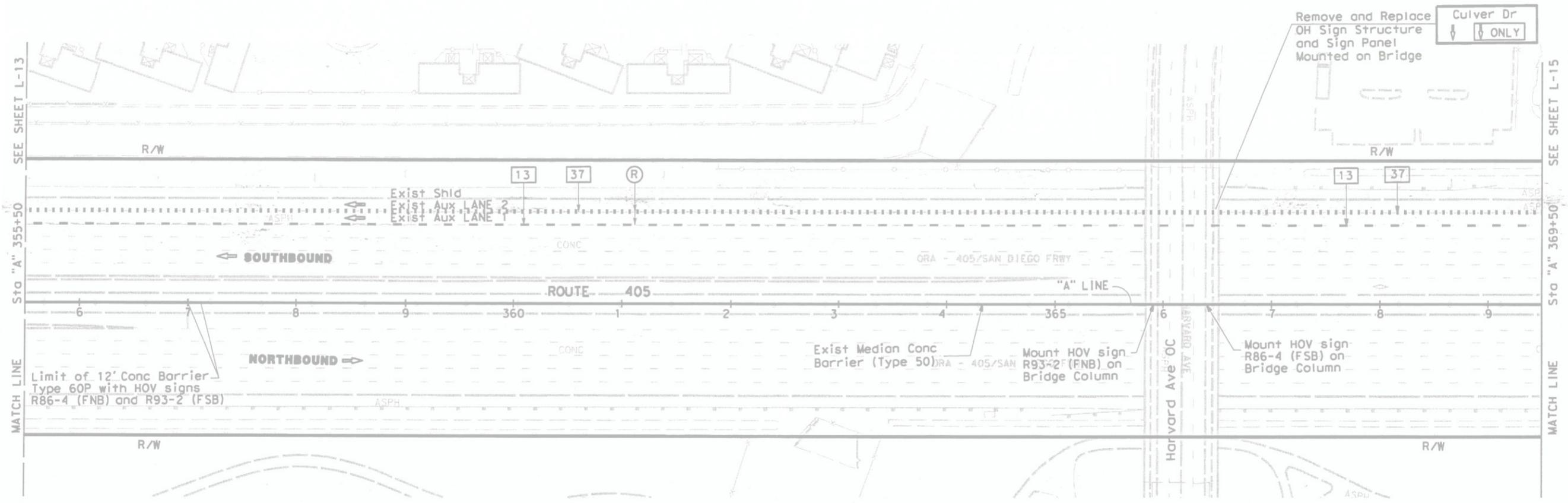
Total Lead Concentrations in mg/kg
 WET Lead, DI-WET Lead and TCLP Concentrations in mg/l
 NS = Not sampled due to surface paving
 < = Not detected above laboratory reporting limit
 --- = Not Analyzed
 J = Result qualified as an estimated value due to analytical bias in precision or accuracy
 mg/kg = Milligram per kilogram
 mg/l = Milligram per liter

Sample	Depth (ft.)	collected from
B-1-0.0	0.5	collected from 0.0 to 0.5 ft.
B-1-1.0	1.5	collected from 1.0 to 1.5 ft.
B-1-2.5	3.0	collected from 2.5 to 3.0 ft.
B-1-3.5	4.0	collected from 3.5 to 4.0 ft.



GEOCON
 CONSULTANTS, INC.
 3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA. 91504
 PHONE 818.841.8388 - FAX 818.841.1704

Interstate 405 from Culver Dr. to Jeffrey Rd/University Dr.	
Orange County, California	SITE PLAN
GEOCON Proj. No. S9890-06-10	
Task Order No. 12-0M3501-10	October 2015 Figure 2-13



SEE SHEET L-13
Sta "A" 355+50
MATCH LINE

SEE SHEET L-15
Sta "A" 369+50
MATCH LINE



GEOCON
CONSULTANTS, INC.
3303 N. SAN FERNANDO BLVD. - SUITE 100 - BURBANK, CA. 91504
PHONE 818.841.8388 - FAX 818.841.1704

Interstate 405 from Culver Dr. to Jeffrey Rd/University Dr.		
Orange County, California		SITE PLAN
GEOCON Proj. No. S9890-06-10		
Task Order No. 12-0M3501-10	October 2015	Figure 2-14

TABLE 1
 BORING COORDINATES AND SUMMARY OF LEAD AND pH ANALYTICAL RESULTS
 INTERSTATE 405 FROM SOUTHBOUND CULVER DRIVE OFFRAMP TO JEFFREY ROAD/UNIVERSITY DRIVE OVERCROSSING
 IRVINE, CALIFORNIA

Sample ID	LATITUDE	LONGITUDE	Sample Depth (feet)	Total Lead ³ (mg/kg)	WET Lead ⁴ (mg/l)	WET-DI Lead ⁵ (mg/l)	TCLP Lead ⁶ (mg/l)	pH ⁷
B-1-0.0	33.655507	-117.774094	0.0-0.5	76	1.2	--	--	--
B-1-1.0			1.0-1.5	18	--	--	--	--
B-2-0.0	33.656141	-117.775200	0.0-0.5	22	--	--	--	--
B-2-1.0			1.0-1.5	6.9	--	--	--	--
B-3-0.0	33.656456	-117.775764	0.0-0.5	28	--	--	--	--
B-3-1.0			1.0-1.5	20	--	--	--	--
B-3-2.5			2.5-3.0	4.7	--	--	--	--
B-3-3.5			3.5-4.0	3.5	--	--	--	--
B-4-0.0	33.657040	-117.776779	0.0-0.5	27	--	--	--	--
B-4-1.0			1.0-1.5	45	--	--	--	--
B-4-2.5			2.5-3.0	3.0	--	--	--	--
B-4-3.5			3.5-4.0	2.4	--	--	--	--
B-5-0.0	33.657805	-117.778120	0.0-0.5	43	--	--	--	--
B-5-1.0			1.0-1.5	6.4	--	--	--	--
B-5-2.5			2.5-3.0	2.4	--	--	--	--
B-5-3.5			3.5-4.0	2.5	--	--	--	--
B-6-0.0	33.658422	-117.779188	0.0-0.5	31	--	--	--	--
B-6-1.0			1.0-1.5	9.6	--	--	--	--
B-6-2.5			2.5-3.0	2.5	--	--	--	--
B-6-3.5			3.5-4.0	3.2	--	--	--	--
B-7	No Sample - Area Paved							
B-8-0.0	33.658929	-117.780072	0.0-0.5	32	--	--	--	--
B-8-1.0			1.0-1.5	20	--	--	--	--
B-8-2.5			2.5-3.0	2.6	--	--	--	--
B-8-3.5			3.5-4.0	2.5	--	--	--	--
B-9-0.0	33.659542	-117.781140	0.0-0.5	44	--	--	--	--
B-9-1.0			1.0-1.5	3.6	--	--	--	--
B-9-2.5			2.5-3.0	2.8	--	--	--	--
B-9-3.5			3.5-4.0	3.3	--	--	--	--
B-10-0.0	33.660266	-117.782410	0.0-0.5	28	--	--	--	--
B-10-1.0			1.0-1.5	4.9	--	--	--	--
B-10-2.5			2.5-3.0	3.9	--	--	--	--
B-10-3.5			3.5-4.0	3.2	--	--	--	--
B-11-0.0	33.660809	-117.783411	0.0-0.5	22	--	--	--	--
B-11-1.0			1.0-1.5	37	--	--	--	--
B-11-2.5			2.5-3.0	6.9	--	--	--	--
B-11-3.5			3.5-4.0	7.6	--	--	--	--
B-12-0.0	33.661200	-117.784223	0.0-0.5	13	--	--	--	--
B-12-1.0			1.0-1.5	190	6.2	0.14 J	0.0083 J	8.2
B-12-2.5			2.5-3.0	3.6	--	--	--	--
B-12-3.5			3.5-4.0	2.7	--	--	--	--
B-13-0.0	33.661526	-117.785007	0.0-0.5	25	--	--	--	--
B-13-1.0			1.0-1.5	14	--	--	--	--
B-14-0.0	33.661800	-117.785760	0.0-0.5	49	--	--	--	--
B-14-1.0			1.0-1.5	18	--	--	--	--
B-15-0.0	33.662033	-117.786501	0.0-0.5	150	1.7	--	--	--
B-15-1.0			1.0-1.5	29	--	--	--	--

TABLE 1
 BORING COORDINATES AND SUMMARY OF LEAD AND pH ANALYTICAL RESULTS
 INTERSTATE 405 FROM SOUTHBOUND CULVER DRIVE OFFRAMP TO JEFFREY ROAD/UNIVERSITY DRIVE OVERCROSSING
 IRVINE, CALIFORNIA

Sample ID	LATITUDE	LONGITUDE	Sample Depth (feet)	Total Lead ³ (mg/kg)	WET Lead ⁴ (mg/l)	WET-DI Lead ⁵ (mg/l)	TCLP Lead ⁶ (mg/l)	pH ⁷
B-16-0.0	33.662257	-117.787340	0.0-0.5	18	--	--	--	--
B-16-1.0			1.0-1.5	38	--	--	--	--
B-17-0.0	33.662474	-117.788315	0.0-0.5	27	--	--	--	--
B-17-1.0			1.0-1.5	49	--	--	--	--
B-18-0.0	33.662722	-117.789966	0.0-0.5	36	--	--	--	--
B-18-1.0			1.0-1.5	24	--	--	--	--
B-18-2.5			2.5-3.0	3.0	--	--	--	--
B-18-3.5			3.5-4.0	2.8	--	--	--	--
B-19-0.0	33.662881	-117.791090	0.0-0.5	44	--	--	--	--
B-19-1.0			1.0-1.5	17	--	--	--	--
B-20-0.0	33.663039	-117.792195	0.0-0.5	19	--	--	--	--
B-20-1.0			1.0-1.5	54	1.6	--	--	--
B-21-0.0	33.663152	-117.793040	0.0-0.5	20	--	--	--	--
B-21-1.0			1.0-1.5	42	--	--	--	--
B-22-0.0	33.663379	-117.794576	0.0-0.5	11	--	--	--	--
B-22-1.0			1.0-1.5	19	--	--	--	--
B-22-2.5			2.5-3.0	32	--	--	--	--
B-22-3.5			3.5-4.0	22	--	--	--	--
B-23-0.0	33.663562	-117.795886	0.0-0.5	20	--	--	--	--
B-23-1.0			1.0-1.5	10	--	--	--	--
B-23-2.5			2.5-3.0	7.6	--	--	--	--
B-23-3.5			3.5-4.0	2.8	--	--	--	--
B-24-0.0	33.663714	-117.796993	0.0-0.5	16	--	--	--	--
B-24-1.0			1.0-1.5	13	--	--	--	--
B-24-2.5			2.5-3.0	11	--	--	--	--
B-24-3.5			3.5-4.0	10	--	--	--	--
B-25-0.0	33.663803	-117.797679	0.0-0.5	15	--	--	--	--
B-25-1.0			1.0-1.5	12	--	--	--	--
B-25-2.5			2.5-3.0	12	--	--	--	--
B-26-0.0	33.663880	-117.798225	0.0-0.5	20	--	--	--	--
B-26-1.0			1.0-1.5	9.7	--	--	--	--
B-26-2.5			2.5-3.0	8.7	--	--	--	--
B-26-3.5			3.5-4.0	9.1	--	--	--	--
B-27-0.0	33.663997	-117.799043	0.0-0.5	11	--	--	--	--
B-27-1.0			1.0-1.5	13	--	--	--	--
B-27-2.5			2.5-3.0	19	--	--	--	--
B-27-3.5			3.5-4.0	16	--	--	--	--
B-28-0.0	33.663833	-117.800161	0.0-0.5	100	7.9	<0.038	0.11	8.6
B-28-1.0			1.0-1.5	5.4	--	--	--	--
B-28-2.5			2.5-3.0	8.3	--	--	--	--
B-28-3.5			3.5-4.0	2.8	--	--	--	--
B-29-0.0	33.66416	-117.800215	0.0-0.5	41	--	--	--	--
B-29-1.0			1.0-1.5	20	--	--	--	--

TABLE 1
 BORING COORDINATES AND SUMMARY OF LEAD AND pH ANALYTICAL RESULTS
 INTERSTATE 405 FROM SOUTHBOUND CULVER DRIVE OFFRAMP TO JEFFREY ROAD/UNIVERSITY DRIVE OVERCROSSING
 IRVINE, CALIFORNIA

Sample ID	LATITUDE	LONGITUDE	Sample Depth (feet)	Total Lead ³ (mg/kg)	WET Lead ⁴ (mg/l)	WET-DI Lead ⁵ (mg/l)	TCLP Lead ⁶ (mg/l)	pH ⁷
B-30-0.0	33.664277	-117.801101	0.0-0.5	9.4	--	--	--	--
B-30-1.0			1.0-1.5	4.5	--	--	--	--
B-30-2.5			2.5-3.0	2.0	--	--	--	--
B-30-3.5			3.5-4.0	2.9	--	--	--	--
B-31-0.0	33.664424	-117.802144	0.0-0.5	18	--	--	--	--
B-31-1.0			1.0-1.5	1.5	--	--	--	--
B-31-2.5			2.5-3.0	1.4	--	--	--	--
B-31-3.5			3.5-4.0	1.4	--	--	--	--
B-32-0.0	33.664541	-117.802953	0.0-0.5	3.2	--	--	--	--
B-32-1.0			1.0-1.5	3.2	--	--	--	--
B-32-2.5			2.5-3.0	3.0	--	--	--	--
B-32-3.5			3.5-4.0	2.2	--	--	--	--
B-33-0.0	33.664759	-117.804555	0.0-0.5	60	7.9	<0.038	0.013 J	9.3
B-33-1.0			1.0-1.5	4.1	--	--	--	--
B-33-2.5			2.5-3.0	3.3	--	--	--	--
B-33-3.5			3.5-4.0	1.8	--	--	--	--
B-34-0.0	33.664688	-117.806384	0.0-0.5	40	--	--	--	--
B-34-1.0			1.0-1.5	5.6	--	--	--	--
B-34-2.5			2.5-3.0	4.4	--	--	--	--
B-34-3.5			3.5-4.0	1.6	--	--	--	--
B-35-0.0	33.665102	-117.807016	0.0-0.5	23	--	--	--	--
B-35-1.0			1.0-1.5	5.4	--	--	--	--
B-35-2.5			2.5-3.0	3.6	--	--	--	--
B-35-3.5			3.5-4.0	2.5	--	--	--	--
B-36-0.0	33.665286	-117.808341	0.0-0.5	8.8	--	--	--	--
B-36-1.0			1.0-1.5	4.7	--	--	--	--
B-36-2.5			2.5-3.0	6.4	--	--	--	--
B-36-3.5			3.5-4.0	6.0	--	--	--	--
B-37-0.0	33.665396	-117.809016	0.0-0.5	31	--	--	--	--
B-37-1.0			1.0-1.5	4.9	--	--	--	--
B-37-2.5			2.5-3.0	3.0	--	--	--	--
B-37-3.5			3.5-4.0	1.6	--	--	--	--
B-38-0.0	33.665602	-117.810222	0.0-0.5	24	--	--	--	--
B-38-1.0			1.0-1.5	11	--	--	--	--
B-38-2.5			2.5-3.0	1.3	--	--	--	--
B-38-3.5			3.5-4.0	1.4	--	--	--	--
B-39-0.0	33.664929	-117.808141	0.0-0.5	84	4.7	--	--	--
B-39-1.0			1.0-1.5	4.2	--	--	--	--
B-39-2.5			2.5-3.0	4.9	--	--	--	--
B-39-3.5			3.5-4.0	4.4	--	--	--	--
B-40-0.0	33.665215	-117.810018	0.0-0.5	100	12	<0.038	0.066	6.6*
B-40-1.0			1.0-1.5	3.8	--	--	--	--
B-40-2.5			2.5-3.0	3.1	--	--	--	--
B-40-3.5			3.5-4.0	2.7	--	--	--	--
B-41-0.0	33.665519	-117.811476	0.0-0.5	83	4.5	--	--	--
B-41-1.0			1.0-1.5	7.1	--	--	--	--
B-41-2.5			2.5-3.0	2.5	--	--	--	--
B-41-3.5			3.5-4.0	2.2	--	--	--	--

TABLE 1
 BORING COORDINATES AND SUMMARY OF LEAD AND pH ANALYTICAL RESULTS
 INTERSTATE 405 FROM SOUTHBOUND CULVER DRIVE OFFRAMP TO JEFFREY ROAD/UNIVERSITY DRIVE OVERCROSSING
 IRVINE, CALIFORNIA

Sample ID	LATITUDE	LONGITUDE	Sample Depth (feet)	Total Lead ¹ (mg/kg)	WET Lead ⁴ (mg/l)	WET-DI Lead ⁵ (mg/l)	TCLP Lead ⁶ (mg/l)	pH ⁷
B-42-0.0	33.665952	-117.811837	0.0-0.5	33	--	--	--	--
B-42-1.0			1.0-1.5	12	--	--	--	--
B-42-2.5			2.5-3.0	2.6	--	--	--	--
B-42-3.5			3.5-4.0	2.1	--	--	--	--
B-43-0.0	33.665810	-117.812585	0.0-0.5	210	13	0.53 J	0.30	7.5*
B-43-1.0			1.0-1.5	4.5	--	--	--	--
B-43-2.5			2.5-3.0	2.1	--	--	--	--
B-43-3.5			3.5-4.0	5.3	--	--	--	--
B-44-0.0	33.666459	117.814655	0.0-0.5	29	--	--	--	--
B-44-1.0			1.0-1.5	3.7	--	--	--	--
B-44-2.5			2.5-3.0	4.1	--	--	--	--
B-44-3.5			3.5-4.0	3.2	--	--	--	--
B-45-0.0	33.666956	-117.816109	0.0-0.5	82	6.4	<0.038	0.067	7.6*
B-45-1.0			1.0-1.5	4.8	--	--	--	--
B-45-2.5			2.5-3.0	2.5	--	--	--	--
B-45-3.5			3.5-4.0	2.0	--	--	--	--
B-46-0.0	33.66735	-117.817176	0.0-0.5	8.8	--	--	--	--
B-46-1.0			1.0-1.5	1.5	--	--	--	--
B-46-2.5			2.5-3.0	0.86 J	--	--	--	--
B-46-3.5			3.5-4.0	1.8	--	--	--	--
B-47-0.0	33.667806	-117.818606	0.0-0.5	16	--	--	--	--
B-47-1.0			1.0-1.5	1.3	--	--	--	--
B-47-2.5			2.5-3.0	2.5	--	--	--	--
B-47-3.5			3.5-4.0	2.0	--	--	--	--
B-48-0.0	33.668130	-117.819614	0.0-0.5	5.6	--	--	--	--
B-48-1.0			1.0-1.5	0.72 J	--	--	--	--
B-48-2.5			2.5-3.0	4.0	--	--	--	--
B-48-3.5			3.5-4.0	3.4	--	--	--	--
B-49-0.0	33.668669	-117.821122	0.0-0.5	190	8.1	1.7	0.68	7.8*
B-49-1.0			1.0-1.5	1.4	--	--	--	--
B-49-2.5			2.5-3.0	0.90 J	--	--	--	--
B-49-3.5			3.5-4.0	0.27 J	--	--	--	--
B-50-0.0	33.669056	-117.822473	0.0-0.5	48	--	--	--	--
B-50-1.0			1.0-1.5	3.6	--	--	--	--
B-50-2.5			2.5-3.0	3.0	--	--	--	--
B-50-3.5			3.5-4.0	5.7	--	--	--	--
B-51-0.0	33.669664	-117.824113	0.0-0.5	97	6.2	<0.038	0.034 J	7.9
B-51-1.0			1.0-1.5	4.0	--	--	--	--
B-51-2.5			2.5-3.0	3.1	--	--	--	--
B-51-3.5			3.5-4.0	4.5	--	--	--	--
B-52-0.0	33.669444	-117.824212	0.0-0.5	61	2.3	--	--	--
B-52-1.0			1.0-1.5	4.9	--	--	--	--
B-52-2.5			2.5-3.0	2.4	--	--	--	--
B-52-3.5			3.5-4.0	3.0	--	--	--	--
B-53-0.0	33.668792	-117.824014	0.0-0.5	130	4.0	--	--	--
B-53-1.0			1.0-1.5	2.8	--	--	--	--
B-53-2.5			2.5-3.0	4.6	--	--	--	--
B-53-3.5			3.5-4.0	3.8	--	--	--	--

TABLE 1
 BORING COORDINATES AND SUMMARY OF LEAD AND pH ANALYTICAL RESULTS
 INTERSTATE 405 FROM SOUTHBOUND CULVER DRIVE OFFRAMP TO JEFFREY ROAD/UNIVERSITY DRIVE OVERCROSSING
 IRVINE, CALIFORNIA

Sample ID	LATITUDE	LONGITUDE	Sample Depth (feet)	Total Lead ³ (mg/kg)	WET Lead ⁴ (mg/l)	WET-DI Lead ⁵ (mg/l)	TCLP Lead ⁶ (mg/l)	pH ⁷
B-54-0.0	33.668351	-117.820340	0.0-0.5	80	5.0	0.11 J	0.23	8.3*
B-54-1.0			1.0-1.5	8.2	--	--	--	--
B-54-2.5			2.5-3.0	1.6	--	--	--	--
B-54-3.5			3.5-4.0	4.2	--	--	--	--
B-55-0.0	33.668708	-117.821874	0.0-0.5	23	--	--	--	--
B-55-1.0			1.0-1.5	3.3	--	--	--	--
B-55-2.5			2.5-3.0	4.1	--	--	--	--
B-55-3.5			3.5-4.0	2.9	--	--	--	--
B-56-0.0	33.669855	-117.824637	0.0-0.5	210	9.2	<0.038	0.088	7.8
B-56-1.0			1.0-1.5	4.4	--	--	--	--
B-56-2.5			2.5-3.0	2.0	--	--	--	--
B-56-3.5			3.5-4.0	2.3	--	--	--	--
B-57-0.0	33.670167	-117.825546	0.0-0.5	310	16	<0.038	0.19	8.0
B-57-1.0			1.0-1.5	3.2	--	--	--	--
B-57-2.5			2.5-3.0	3.6	--	--	--	--
B-57-3.5			3.5-4.0	3.9	--	--	--	--
B-58	No Sample - Area Paved							
B-59-0.0	33.669963	117.825652	0.0-0.5	200	8.6	<0.038	0.087	8.1
B-59-1.0			1.0-1.5	24	--	--	--	--
B-59-2.5			2.5-3.0	2.6	--	--	--	--
B-59-3.5			3.5-4.0	0.66 J	--	--	--	--
B-60-0.0	33.670482	-117.8267714	0.0-0.5	24	--	--	--	--
B-60-1.0			1.0-1.5	14	--	--	--	--
B-60-2.5			2.5-3.0	8.5	--	--	--	--
B-60-3.5			3.5-4.0	12	--	--	--	--
B-61-0.0	33.662666	-117.792545	0.0-0.5	12	--	--	--	--
B-61-1.0			1.0-1.5	3.4	--	--	--	--
B-61-2.5			2.5-3.0	2.7	--	--	--	--
B-61-3.5			3.5-4.0	1.9	--	--	--	--
B-62-0.0	33.662722	-117.793282	0.0-0.5	21	--	--	--	--
B-62-1.0			1.0-1.5	2.9	--	--	--	--
B-62-2.5			2.5-3.0	2.5	--	--	--	--
B-62-3.5			3.5-4.0	2.6	--	--	--	--
B-63-0.0	33.662758	-117.794276	0.0-0.5	8.6	--	--	--	--
B-63-1.0			1.0-1.5	3.2	--	--	--	--
B-63-2.5			2.5-3.0	4.5	--	--	--	--
B-63-3.5			3.5-4.0	4.6	--	--	--	--
B-64-0.0	33.662525	-117.795198	0.0-0.5	4.8	--	--	--	--
B-64-1.0			1.0-1.5	3.6	--	--	--	--
B-64-2.5			2.5-3.0	3.6	--	--	--	--
B-64-3.5			3.5-4.0	2.9	--	--	--	--

TABLE 1
 BORING COORDINATES AND SUMMARY OF LEAD AND pH ANALYTICAL RESULTS
 INTERSTATE 405 FROM SOUTHBOUND CULVER DRIVE OFFRAMP TO JEFFREY ROAD/UNIVERSITY DRIVE OVERCROSSING
 IRVINE, CALIFORNIA

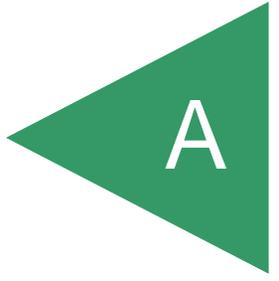
Sample ID	LATITUDE	LONGITUDE	Sample Depth (feet)	Total Lead ³ (mg/kg)	WET Lead ⁴ (mg/l)	WET-DI Lead ⁵ (mg/l)	TCLP Lead ⁶ (mg/l)	pH ⁷
B-65-0.0	33.662232	-117.79561	0.0-0.5	7.6	--	--	--	--
B-65-1.0			1.0-1.5	1.0	--	--	--	--
B-65-2.5			2.5-3.0	1.6	--	--	--	--
B-65-3.5			3.5-4.0	3.5	--	--	--	--
Average Values:				20.4	6.7	0.2	0.2	8.0
Regulatory Limits:				1,411	5.0	1.5	5.0	5.0

Notes:

1. Samples analyzed by Advanced Technology Laboratories of Signal Hill, California.
 2. Samples were collected using a hand auger; sample depths in feet below ground surface.
 3. U.S. Environmental Protection Agency (EPA) Method 6010; concentrations in milligrams per kilogram (mg/kg).
 4. Soluble lead using the Waste Extraction Test (WET) with citric acid as the extractant; concentrations in milligrams per liter (mg/l).
 5. Soluble lead using the WET with deionized water as the extractant (WET-DI); concentrations in mg/l.
 6. Soluble lead analyzed by the Toxicity Characteristic Leaching Procedure (TCLP); concentrations in mg/l.
 7. U.S. EPA Method 9045.
 8. -- = Not analyzed.
 9. Limit specified in addendum to Variance issued by the Department of Toxic Substances Control to Caltrans (DTSC Variance, September 22, 200 Addendum, June 2014).
 10. Soluble Threshold Limit Concentration (STLC) for California hazardous waste (California Code of Regulations [CCR] Title 22, Section 66261
 11. Limit Specified in DTSC Variance.
 12. Maximum concentration for the Toxicity Characteristic of Resource Conservation Recovery Act (RCRA) hazardous waste (CCR Title 22, Section 66261.24).
- J = Qualified as an estimated value because the result is greater than the method detection limit but less than the practical quantitation limit.

APPENDIX

A





Matthew Rodriguez
Secretary for
Environmental Protection



Department of Toxic Substances Control

Barbara A. Lee, Director
1001 "I" Street
P.O. Box 806
Sacramento, California 95812-0806



Edmund G. Brown Jr.
Governor

June 30, 2015

Ms. Katrina C. Pierce, Chief
Division of Environmental Analysis
California Department of Transportation
P.O. Box 942873, MS-27
Sacramento, California 94273-0001

EXTENSION OF STATEWIDE VARIANCE NO. V09HQSCD006 FOR CALTRANS HANDLING OF AERIALY DEPOSITED LEAD SOIL

Dear Ms. Pierce:

This letter is in response to the June 16, 2015 request from the California Department of Transportation (CalTrans) for an extension of Variance No. V09HQSCD006 (Variance).

The Variance is hereby extended to October 31, 2015 and is subject to the following additional conditions:

- (1) Caltrans shall provide at least 30 day advance written notification to DTSC prior to implementation of any project for which CalTrans will invoke this Variance, and shall send copies of the notification to the RWQCB, AQMD (or APCD, as applicable) and local Certified Uniform Program Agency (CUPA). For projects that overlie multiple local agency jurisdictions, all appropriate agencies shall receive a copy of the notification. The advance written notification shall include the following information:
 - A. A statement that the project will entail excavation, stockpiling and burial of ADL-contaminated soil pursuant to DTSC Variance No. V15HWMP001;
 - B. Project number;
 - C. Project description;
 - D. Project Limits;
 - E. Electronic versions of the following documents:
 - i. the environmental document prepared for the project;
 - ii. this Variance; and
 - iii. DTSC-prepared fact sheet about this Variance.

- F. Identify any ADL soil that will be moved from the project area to another project area with a complete description of additional project areas.
 - G. The following documents will be made available as described above within 10 days of completion:
 - a. The Caltrans-approved Excavation and Transportation Plan,
 - b. Contact information for Resident Engineer and Project Manager,
- (2) For every property where ADL-contaminated soil is buried pursuant to this variance, CalTrans shall, in compliance with California Code of Regulations, title 22, section 67391.1, execute a legal instrument restricting use of that property, which instrument shall be binding in perpetuity upon CalTrans or any future legatee of the property. Said instrument shall be a land use covenant, except as provided by (a), and shall be recorded with the county (or counties) wherein ADL-contaminated soil has been buried.
- (a) For any property for which the Department determines as set forth in California Code of Regulations, title 22, section 67391.1(f) a land use covenant is not feasible, then another institutional control mechanism may be used as approved by the Department.

This extension is granted without waiver of any rights that DTSC has to enforce any violations of the Variance that may have occurred prior to July 1, 2015.

If you have any questions regarding this extension of the Variance, please contact me at (916) 255-3582.

Sincerely,



Raymond Leclerc, P.E.
Division Chief

cc: See next page.

Ms. Katrina C. Pierce
June 30, 2015
Page 3

Mr. Scott McGowen, Chief
Division of Environmental Analysis
P.O. Box 942874, MS-27
Sacramento, California 94271-0001

Mr. Reed Sato
Chief Counsel
Office of Legal Affairs
Department of Toxic Substances Control
1001 I Street, 23rd Floor
Sacramento, California 95814



Department of Toxic Substances Control

Matthew Rodriguez
Secretary for
Environmental Protection

Barbara A. Lee, Director
1001 "I" Street
P.O. Box 806
Sacramento, California 95812-0806

Edmund G. Brown Jr.
Governor

December 16, 2014

Ms. Katrina C. Pierce, Chief
Division of Environmental Analysis
California Department of Transportation
P.O. Box 942873, MS-27
Sacramento, CA 94273-0001

**SUBJECT: SECOND EXTENSION OF STATEWIDE VARIANCE NO.
V09HQSCD006 FOR CALTRANS' HANDLING OF AERIALY
DEPOSITED LEAD SOIL**

Dear Ms. Pierce:

This letter is in response to the December 2, 2014, request from the California Department of Transportation (Caltrans), for an extension for Variance No. V09HQSCD006 (Variance).

The original Variance was issued on June 30, 2009, with an effective period of five years, such that it was set to expire on June 30, 2014. Caltrans requested an extension in May 2014 and received a six-month extension of the Variance to December 31, 2014. The Department of Toxic Substances Control (DTSC) will be unable to issue Caltrans a new five-year Variance before the current Variance extension expires on December 31, 2014. This letter hereby extends the effective date of Variance from December 31, 2014 to June 30, 2015. This extension enables Caltrans to proceed with already-scheduled highway improvement projects without interruption.

The Variance applies to Caltrans' management of soil contaminated by aerial deposition of lead from motor vehicle exhaust. Such soil, historically referred to as "aerially deposited lead (ADL) soil," occurs along many roadsides statewide, and must be appropriately handled by Caltrans in the course of highway improvement projects. For such soil that contains lead in concentrations exceeding state, but not federal, regulatory thresholds for hazardous waste, the

Ms. Katrina C. Pierce
December 16, 2014
Page two

Variance waives specific hazardous waste management standards. In lieu of the standards waived, the Variance imposes alternate management standards (conditions) on Caltrans' soil handling activities, to ensure that the handling and relocation of the soil is conducted in a manner protective of human health and safety and the environment. The Variance applies to Caltrans' highway improvement projects in all Caltrans Districts.

If you have further questions regarding this Variance extension, please contact Mr. Bob Gipson, DTSC Project Manager, at (916) 327-4061.

Sincerely,



Pauline Batarseh, Chief
Policy Implementation and Support Branch
Policy and Program Support Division
Hazardous Waste Management Program

Cc:
Shaila Chowdhury
Chief, Office of Hazardous Waste, Air, Noise and Paleontology
Division of Environmental Analysis
California Department of Transportation
Sacramento, CA 94273-0001

Richard Bailey
Senior Engineering Geologist
Division of Environmental Analysis
California Department of Transportation
Sacramento, CA 94273-0001

Kim Christmann
Senior Engineering Geologist
Division of Environmental Analysis
California Department of Transportation
Sacramento, CA 94273-0001

Ms. Katrina C. Pierce
December 16, 2014
Page three

Donn Diebert, P.E.
Chief, Policy Implementation Unit
Policy Implementation and Support Branch
Policy and Program Support Division
Hazardous Waste Management Program
Department of Toxic Substances Control
1001 I Street, Sacramento, CA 95812-0806

Bob Gipson
Environmental Scientist
Policy Implementation Unit
Policy Implementation and Support Branch
Policy and Program Support Division
Hazardous Waste Management Program
Department of Toxic Substances Control
1001 I Street, Sacramento, CA 95812-0806



Matthew Rodriguez
Secretary for
Environmental Protection



Department of Toxic Substances Control



Edmund G. Brown Jr.
Governor

Miriam Barcellona Ingenito
Acting Director
1001 "I" Street
P.O. Box 806
Sacramento, California 95812-0806

June 26, 2014

Ms. Katrina C. Pierce, Chief
Division of Environmental Analysis
California Department of Transportation
P.O. Box 942873, MS-27
Sacramento, California 94273-0001

EXTENSION OF STATEWIDE VARIANCE NO. V09HQSCD006 FOR CALTRANS' HANDLING OF AERIALY DEPOSITED LEAD

Dear Ms. Pierce:

The Department of Toxic Substances Control (DTSC) received a letter dated May 30, 2014, from the California Department of Transportation (Caltrans), regarding Variance No. V09HQSCD006 (Variance), issued June 30, 2009. Caltrans is requesting DTSC to grant a six-month extension on the Variance with the new expiration date of December 31, 2014, instead of June 30, 2014. The Variance waives specified hazardous waste management requirements for purposes of Caltrans' handling of roadside soil contaminated with aerially deposited lead, and applies to Caltrans' highway improvement projects in all Caltrans Districts statewide.

Based on recent discussions between Caltrans and DTSC both agreed a six-month extension is necessary to provide adequate time for DTSC to finalize the new (renewal) variance, and for Caltrans to review and provide comments on the renewal variance. Key next steps in DTSC's review process include finalizing the ecological and health risk assessments, working on the California Environmental Quality Act documents, drafting of the renewal variance, and allowing adequate time for a public notice period for the renewal variance.

This letter hereby extends the effective date of Variance No. V09HQSCD006 to December 31, 2014. If you have any questions regarding this extension, please contact Mr. Bob Gipson of my staff at (916) 327-4061 or via email at Bob.Gipson@dtsc.ca.gov.

Sincerely,

Pauline Batarseh, Chief
Policy Implementation and Support Branch
Policy and Program Support Division
Hazardous Waste Management Program

cc: See next page.



*California Environmental Protection Agency
Department of Toxic Substances Control*

VARIANCE

Applicant Names:

Variance No. V09HQSCD006

State of California
Department of Transportation
(Caltrans)
1120 N Street
Sacramento, California 95814

Effective Date: July 1, 2009

Expiration Date: July 1, 2014

Modification History:

Pursuant to California Health and Safety Code, Section 25143, the Department of Toxic Substances Control hereby issues the attached Variance consisting of 9 pages to the Department of Transportation.

A handwritten signature in cursive script that reads "Beverly Rikala".

Beverly Rikala
Team Leader, Operating Facilities Team
Department of Toxic Substances Control

Date: 6/30/09

VARIANCE

1. INTRODUCTION.

a) Pursuant to Health and Safety Code, section 25143, the California Department of Toxic Substances Control (DTSC) grants this variance to the applicant below for waste considered to be hazardous solely because of its lead concentrations and as further specified herein.

b) DTSC hereby grants this variance only from the requirements specified herein and only in accordance with all terms and conditions specified herein.

2. IDENTIFYING INFORMATION.

APPLICANT/OWNER/OPERATOR

State of California
Department of Transportation, (Caltrans)
All Districts

3. TYPE OF VARIANCE.

Generation, Manifest, Transportation, Storage and Disposal.

4. ISSUANCE AND EXPIRATION DATES.

DATE ISSUED: July 1, 2009 EXPIRATION DATE: July 1, 2014

5. APPLICABLE STATUTES AND REGULATIONS. The hazardous waste that is the subject of this variance is fully regulated under Health and Safety Code, section 25100, et seq. and California Code of Regulations, title 22, division 4.5 except as specifically identified in Section 8 of this variance.

6. DEFINITION. For purposes of this variance, "lead-contaminated soil(s)" shall mean soil that meets the criteria for hazardous waste but contains less than 3397 mg/kg total lead and is hazardous primarily because of aeriially-deposited lead contamination associated with exhaust emissions from the operation of motor vehicles.

7. FINDINGS/DETERMINATIONS. DTSC has determined that the variance applicant meets the requirements set forth in Health and Safety Code, section 25143 for a variance from specific regulatory requirements as outlined in Section 8 of this variance. The specific determinations and findings made by DTSC are as follows:

a) Caltrans intends to excavate, stockpile, transport, bury and cover large volumes of soil associated with highway construction projects. In the more urbanized highway corridors around the State this soil is contaminated with lead, primarily due to historic emissions from automobile exhausts. In situ sampling and laboratory testing has shown that some of the soil contains concentrations of lead in excess of State regulatory thresholds, and thus any generated waste from disturbance of the soil

would be regulated as hazardous waste. Such soil contains a Total Threshold Limit Concentration (TTL) of 1000 milligrams per kilogram (mg/kg) or more lead and/or it meets or exceeds the Soluble Threshold Limit Concentration (STLC) for lead of 5 milligrams per liter (mg/l). A Human Health Risk Assessment prepared for this variance concludes that soil contaminated with elevated concentrations of lead can be managed in a way that presents no significant risk to human health.

b) The lead-contaminated soil will be placed only in Caltrans' right-of-way. Depending on concentration levels, the wastes will be covered with a minimum thickness of one (1) foot of non-hazardous soil or asphalt/concrete cover and will always be at least five (5) feet above the highest groundwater elevation. Caltrans will assure that proper health and safety procedures will be followed for workers, including any persons engaged in maintenance work in areas where the waste has been buried and covered.

c) DTSC finds and requires that the lead-contaminated soil excavated, stockpiled, transported, buried and covered pursuant to this variance is a non-RCRA hazardous waste, and that the waste management activity is insignificant as a potential hazard to human health and safety and the environment, when managed in accordance with the conditions, limitations and other requirements specified in this variance.

8. PROVISIONS WAIVED.

Provided Caltrans meets the terms and conditions of this variance, DTSC waives the hazardous waste management requirements of Health and Safety Code, Chapter 6.5 and California Code of Regulations, title 22 for the lead-contaminated soil that Caltrans reuses in projects that would require Caltrans to obtain a permit for a disposal facility and any other generator requirements that concern the transportation, manifesting, storage and land disposal of hazardous waste.

9. SPECIFIC CONDITIONS, LIMITATIONS AND OTHER REQUIREMENTS.

In order for the provisions discussed in section 8 to be waived, lead-contaminated soil must not exceed the contaminant concentrations discussed below and Caltrans management practices must meet all the following conditions:

a) Caltrans implementation of this variance shall comply with all applicable state laws and regulations for water quality control, water quality control plans, waste discharge requirements (including storm water permits), and others issued by the State Water Resources Control Board (SWRCB) and/or a California Regional Water Quality Control Board (RWQCB). Caltrans shall provide written notification to the appropriate RWQCB at least 30 days prior to advertisement for bids of projects that involve invocation of this variance, or as otherwise negotiated with the SWRCB or appropriate RWQCB.

b) The waivers in this variance shall only be applied to lead-contaminated soil that is not a RCRA hazardous waste and is hazardous primarily because of aerially-

deposited lead contamination associated with exhaust emissions from the operation of motor vehicles. The variance is not applicable to any other hazardous waste.

c) Soil containing 1.5 mg/l extractable lead or less (based on a modified waste extraction test using deionized water as the extractant) and 1411 mg/kg or less total lead may be used as fill provided that the lead-contaminated soil is placed a minimum of five (5) feet above the maximum historic water table elevation and covered with at least one (1) foot of nonhazardous soil that will be maintained by Caltrans to prevent future erosion.

d) Soil containing 150 mg/L extractable lead or less (based on a modified waste extraction test using deionized water as the extractant) and 3397 mg/kg or less total lead may be used as fill provided that the lead-contaminated soils are placed a minimum of five (5) feet above the maximum historic water table elevation and protected from infiltration by a pavement structure which will be maintained by Caltrans.

e) Lead-contaminated soil with a pH less than 5.5 but greater than 5.0 shall only be used as fill material under the paved portion of the roadway. Lead-contaminated soil with a pH at or less than 5.0 shall be managed as a hazardous waste.

f) For each project that has the potential to generate waste by disturbing lead-contaminated soil (as defined in 6), Caltrans shall conduct sampling and analysis to adequately characterize the soils containing aerially deposited lead in the areas of planned excavation along the project route. Such sampling and analysis shall include the Toxicity Characteristic Leaching Procedure (TCLP) as prescribed by the United States Environmental Protection Agency to determine whether concentrations of contaminants in soil exceed federal criteria for classification as a hazardous waste.

g) Lead-contaminated soil managed pursuant to this variance shall not be moved outside the designated corridor boundaries (see paragraph t) below. All lead-contaminated soil not buried and covered within the same Caltrans corridor where it originated is not eligible for management under this variance and shall be managed as a hazardous waste.

h) Lead-contaminated soil managed pursuant to this variance shall not be placed in areas where it would become in contact with groundwater or surface water (such as streams and rivers).

i) Lead-contaminated soil managed pursuant to this variance shall be buried and covered only in locations that are protected from erosion that may result from storm water run-on and run-off.

j) The lead-contaminated soil shall be buried and covered in a manner that will prevent accidental or deliberate breach of the asphalt, concrete, and/or cover soil.

k) The presence of lead-contaminated soil shall be incorporated into the projects' as-built drawings. The as-built drawings shall be annotated with the location, representative analytical data, and volume of lead-contaminated soil. The as-built drawings shall also state the depth of the cover. These as-built drawings shall be retained by Caltrans.

l) Caltrans shall ensure that no other hazardous wastes, other than the lead-contaminated hazardous waste soil, are placed in the burial areas.

m) Lead-contaminated soil shall not be buried within ten (10) feet of culverts or locations subject to frequent worker exposure.

n) Excavated lead-contaminated soil not placed into the designated area (fill area, roadbed area) by the end of the working day shall be stockpiled and covered with sheets of polyethylene or at least one foot of non-hazardous soil. The lead-contaminated soil, while stockpiled or under transport, shall be protected from contacting surface water and from being dislodged or transported by wind or storm water. The stockpile covers shall be inspected at least once a week and within 24 hours after rainstorms. If the lead-contaminated soil is stockpiled for more than 4 days from the time of excavation, Caltrans shall restrict public access to the stockpile by using barriers that meet the safety requirements of the construction zone. The lead-contaminated soil shall be stockpiled for no more than 90 days from the time the soil is first excavated. If the contaminated soil is stockpiled beyond the 90 day limit Caltrans shall:

1. notify DTSC in writing of the 90 day exceedance and expected date of removal;
2. perform weekly inspections of the stockpiled material to ensure that there is adequate protection from run-on, runoff, public access, and wind dispersion; and
3. notify DTSC on weekly basis of the stockpile status until the stockpile is removed.

The lead-contaminated soil shall be stockpiled for no more than 180 days from the time the soil is first excavated.

o) Caltrans shall ensure that all stockpiling of lead-contaminated soil remains within the project area of the specified corridor. Stockpiling of lead-contaminated soil within the specified corridor, but outside the project area, is prohibited.

p) Caltrans shall conduct confirmatory sampling of any stockpile area in areas not known or expected to contain lead-contaminated soil after removal of the lead-contaminated soil to ensure that contamination has not been left behind or has not migrated from the stockpiled material to the surrounding soils.

q) Caltrans shall stockpile lead-contaminated soil only on high ground (i.e. no sump areas or low points) so that stockpiled soil will not come in contact with surface

water run-on or run-off.

r) Caltrans shall not stockpile lead-contaminated soil in environmentally and ecologically sensitive areas.

s) Caltrans shall ensure that storm/rain run-off that has come into contact with stockpiled lead-contaminated soil will not flow to storm drains, inlets, or waters of the State.

t) Caltrans may dispose of the lead-contaminated soil only within the operating right-of-way of an existing highway, as defined in Streets and Highways Code, section 23. Caltrans may move lead-contaminated soil from one Caltrans project to another Caltrans project only if the lead-contaminated soil remains within the same designated corridor.

Caltrans shall record any movement of lead-contaminated soil by using a bill of lading. The bill of lading must contain: 1) the US DOT description including shipping name, hazard class and ID number; 2) handling codes; 3) quantity of material; 4) volume of material; 5) date of shipment; 6) origin and destination of shipment; and 7) any specific handling instructions. The bill of lading shall be referenced in and kept on file with the project's as-built drawings. The lead-contaminated soil must be kept covered during transportation.

u) For each specific corridor where this variance is to be implemented, all of the following information shall be submitted in writing to DTSC at least five (5) days before construction of any project begins:

1. plan drawing designating the boundaries of the corridor where lead-contaminated soils will be excavated, stockpiled, buried and covered;
2. a list of the Caltrans projects that the corridor encompasses;
3. a list of Caltrans contractors that will be conducting any phase of work on any project affected by this variance;
4. duration of corridor construction;
5. location where sampling and analytical data used to make lead concentration level determinations are kept (e.g. a particular Caltrans project file);
6. name and phone number (including area code) of project resident engineer and project manager;
7. location where Caltrans and contractor health and safety plan and records are kept;

8. location of project special provisions (including page or section number) for soil excavation, transportation, stockpile, burial and placement of cover material;

9. location of project drawings (including drawing page number) for soil excavation, burial and placement of cover in plan and cross section (for example, "The project plans are located at the resident engineer's office located at 5th and Main Streets, City of Fresno, See pages xxxxx of contract xxx");

10. updated information if a Caltrans project within the corridor is added, changed or deleted; and

11. type of environmental document prepared for each project, date of adoption, document title, Clearing House number and where the document is available for review. A copy of the Caltrans Categorical Exemption, Categorical Exclusion Form, or if filed, the Notice of Exemption for any project shall be submitted to the DTSC Headquarters Project Manager.

v) Changes in location of lead-contaminated soil placement, quantities or protection measures (field changes) shall be noted in the resident engineer's project log within five (5) days of the field change.

w) Caltrans shall ensure that field changes are in compliance with the requirements of this variance.

x) Operational procedures described in the California Environmental Quality Act (CEQA) Special Initial Study shall be followed by Caltrans for activities conducted under this variance.

y) Caltrans shall implement appropriate health and safety procedures to protect its employees and the public, and to prevent or minimize exposure to potentially hazardous wastes. A project-specific health and safety plan must be prepared and implemented. The monitoring and exposure standards shall be based on construction standards for exposure to lead in California Code of Regulations, title 8, section 1532.1.

z) Caltrans shall provide a district Coordinator for this variance. This Coordinator will be the primary point of contact for information flowing to, or received from, DTSC regarding any matter or submission under this variance. Caltrans shall promptly notify DTSC of the name of Coordinator and any change in the Coordinator.

aa) Caltrans shall conduct regular inspections, consistent with Caltrans' Maintenance Division's current Pavement Inspection and Slope Inspection programs, of the locations where lead-contaminated soil has been buried and/or covered pursuant to this variance. If site inspection reveals deterioration of cover so that conditions in the variance are not met, Caltrans shall repair or replace the cover.

bb) Caltrans shall develop and implement a record keeping mechanisms to record and retain permanent records of all locations where lead-contaminated soil has been buried per this variance. The records shall be made available to DTSC.

cc) If areas subject to the terms of this variance are sold, relinquished or abandoned (including roadways), all future property owners shall be notified in writing in advance by Caltrans of the requirements of this variance, and Caltrans shall provide the owner with a copy of the variance. A copy of such a notice shall be sent to DTSC and contain the corridor location and project. Caltrans shall also disclose to DTSC and the new owner the location of areas where lead-contaminated soil has been buried. Future property owners shall be subject to the same requirements as Caltrans.

dd) For the purposes of informing the public about instances where the variance is implemented, Caltrans shall:

1. maintain current fact sheets at all Caltrans resident engineer offices and the Caltrans District office. Caltrans shall make the fact sheets available to anyone expressing an interest in variance-related work.
2. maintain a binder(s) containing copies of all reports submitted to DTSC at the District office. Caltrans shall ensure that the binders are readily accessible to the public.
3. carry out the following actions when it identifies additional projects:
 - (A) notify the public via a display advertisement in a newspaper of general circulation in that area.
 - (B) update and distribute the fact sheet to the mailing list and repository locations.

ee) Lead-contaminated soil may be buried only in areas where access is limited or where lead-contaminated soil is covered and contained by a pavement structure.

ff) Dust containing lead-contaminated soil must be controlled. Water or dust palliative may be applied to control dust. If visible dust migration occurs, all excavation, stockpiling and truck loading and burying must be stopped. The granting of this variance confers no relief on Caltrans from compliance with the laws, regulations and requirements enforced by any local air district or the California Air Resources Board.

gg) Sampling and analysis is required to show the lead-contaminated soil meets the variance criteria. All sampling and analysis must be conducted in accordance with the appropriate methods specified in U.S. EPA SW-846.

hh) DTSC retains the right to require Caltrans or any future owner to remove, and properly dispose of, lead-contaminated soil in the event DTSC determines it is necessary for protection of public health, safety or the environment.

ii) DTSC finds that some projects involving lead-contaminated soil are joint projects between Caltrans and other government entities. In these joint projects, Caltrans may not be the lead agency implementing the project although Caltrans is still involved if the project occurs on its right-of-way.

Caltrans may invoke this variance for joint projects where Caltrans and local government entity are involved provided that 1) the project is within the Caltrans Right-of-Way; 2) Caltrans reviews/ oversees all phases of the project including design, contracting, environmental assessment, construction, operation, and maintenance; and 3) Caltrans oversees the project to verify all variance conditions are complied with. Caltrans will be fully responsible for the variance notification and implementation in these joint projects.

jj) All correspondence shall be directed to the following office:

Hazardous Waste Permitting
Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, CA 95826

Attn: Caltrans Lead Variance Notification Unit

10. DISCLAIMER.

a) The issuance of this variance does not relieve Caltrans of the responsibility for compliance with Health and Safety Code, chapter 6.5, or the regulations adopted thereunder, and any other laws and regulations other than those specifically identified in Section 8 of this variance. Caltrans is subject to all terms and conditions herein. The granting of this variance confers no relief from compliance with any federal, State or local requirements other than those specifically provided herein.

b) The issuance of this variance does not release Caltrans from any liability associated with the handling of hazardous waste, except as specifically provided herein and subject to all terms and conditions of this variance.

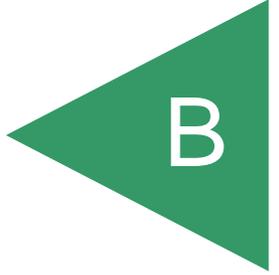
11. VARIANCE MODIFICATION OR REVOCATION. This variance is subject to review at the discretion of DTSC and may be modified or revoked by DTSC upon change of ownership and at any other time pursuant to Health and Safety Code, section 25143.
12. CEQA DETERMINATION. DTSC adopted a Negative Declaration on June 30, 2009.

Approved:

6/30/09
Date

Beverly Rikala
Beverly Rikala
Operating Facilities Team
Department of Toxic Substances Control

APPENDIX





August 05, 2015

Mike Conkle
Geocon West, Inc.
3303 N. San Fernando Blvd., Suite 100
Burbank, CA 91504
Tel: (818) 841-8388
Fax:(818) 841-1704

ELAP No.: 1838
CSDLAC No.: 10196
ORELAP No.: CA300003
TCEQ No. : T104704502

Re: ATL Work Order Number : 1502441
Client Reference : State Route 405 ADL, S9890-06-10

Enclosed are the results for sample(s) received on July 14, 2015 by Advanced Technology Laboratories. The sample(s) are tested for the parameters as indicated on the enclosed chain of custody in accordance with applicable laboratory certifications. The laboratory results contained in this report specifically pertains to the sample(s) submitted.

Thank you for the opportunity to serve the needs of your company. If you have any questions, please feel free to contact me or your Project Manager.

Sincerely,

A handwritten signature in black ink, appearing to read 'E. Rodriguez', with a small 'Er' monogram below it.

Eddie Rodriguez
Laboratory Director

The cover letter and the case narrative are an integral part of this analytical report and its absence renders the report invalid. Test results contained within this data package meet the requirements of applicable state-specific certification programs. The report cannot be reproduced without written permission from the client and Advanced Technology Laboratories.



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/05/2015

SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B-1-0.0	1502441-01	Soil	7/14/15 10:22	7/14/15 16:00
B-1-1.0	1502441-02	Soil	7/14/15 10:27	7/14/15 16:00
B-2-0.0	1502441-03	Soil	7/14/15 10:39	7/14/15 16:00
B-2-1.0	1502441-04	Soil	7/14/15 10:41	7/14/15 16:00
B-3-0.0	1502441-05	Soil	7/14/15 10:46	7/14/15 16:00
B-3-1.0	1502441-06	Soil	7/14/15 10:48	7/14/15 16:00
B-3-2.5	1502441-07	Soil	7/14/15 10:50	7/14/15 16:00
B-3-3.5	1502441-08	Soil	7/14/15 10:53	7/14/15 16:00
B-4-0.0	1502441-09	Soil	7/14/15 10:59	7/14/15 16:00
B-4-1.0	1502441-10	Soil	7/14/15 11:01	7/14/15 16:00
B-4-2.5	1502441-11	Soil	7/14/15 11:03	7/14/15 16:00
B-4-3.5	1502441-12	Soil	7/14/15 11:06	7/14/15 16:00
B-5-0.0	1502441-13	Soil	7/14/15 11:15	7/14/15 16:00
B-5-1.0	1502441-14	Soil	7/14/15 11:17	7/14/15 16:00
B-5-2.5	1502441-15	Soil	7/14/15 11:21	7/14/15 16:00
B-5-3.5	1502441-16	Soil	7/14/15 11:23	7/14/15 16:00
B-6-0.0	1502441-17	Soil	7/14/15 11:27	7/14/15 16:00
B-6-1.0	1502441-18	Soil	7/14/15 11:35	7/14/15 16:00
B-6-2.5	1502441-19	Soil	7/14/15 11:37	7/14/15 16:00
B-6-3.5	1502441-20	Soil	7/14/15 11:39	7/14/15 16:00
B-8-0.0	1502441-21	Soil	7/14/15 11:49	7/14/15 16:00
B-8-1.0	1502441-22	Soil	7/14/15 11:53	7/14/15 16:00
B-8-2.5	1502441-23	Soil	7/14/15 12:00	7/14/15 16:00
B-8-3.5	1502441-24	Soil	7/14/15 12:02	7/14/15 16:00
B-9-0.0	1502441-25	Soil	7/14/15 12:11	7/14/15 16:00
B-9-1.0	1502441-26	Soil	7/14/15 12:13	7/14/15 16:00
B-9-2.5	1502441-27	Soil	7/14/15 12:15	7/14/15 16:00
B-9-3.5	1502441-28	Soil	7/14/15 12:17	7/14/15 16:00
B-10-0.0	1502441-29	Soil	7/14/15 12:23	7/14/15 16:00
B-10-1.0	1502441-30	Soil	7/14/15 12:25	7/14/15 16:00
B-10-2.5	1502441-31	Soil	7/14/15 12:28	7/14/15 16:00
B-10-3.5	1502441-32	Soil	7/14/15 12:30	7/14/15 16:00
B-11-0.0	1502441-33	Soil	7/14/15 12:36	7/14/15 16:00
B-11-1.0	1502441-34	Soil	7/14/15 12:39	7/14/15 16:00



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank , CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/05/2015

B-11-2.5	1502441-35	Soil	7/14/15 12:41	7/14/15 16:00
B-11-3.5	1502441-36	Soil	7/14/15 12:44	7/14/15 16:00
B-12-0.0	1502441-37	Soil	7/14/15 12:55	7/14/15 16:00
B-12-1.0	1502441-38	Soil	7/14/15 12:57	7/14/15 16:00
B-12-2.5	1502441-39	Soil	7/14/15 13:00	7/14/15 16:00
B-12-3.5	1502441-40	Soil	7/14/15 13:02	7/14/15 16:00
B-13-0.0	1502441-41	Soil	7/14/15 13:11	7/14/15 16:00
B-13-1.0	1502441-42	Soil	7/14/15 13:14	7/14/15 16:00

CASE NARRATIVE

Results were J-flagged. "J" is used to flag those results that are between the PQL (Practical Quantitation Limit) and the calculated MDL (Method Detection Limit). Results that are "J" flagged are estimated values since it becomes difficult to accurately quantitate the analyte near the MDL.



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/05/2015

Lead by ICP-AES EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1502441-01	B-1-0.0	76	mg/kg	1.0	0.16	1	B5G0334	07/17/2015	07/20/15	11:02	
1502441-02	B-1-1.0	18	mg/kg	1.0	0.16	1	B5G0334	07/17/2015	07/20/15	11:02	
1502441-03	B-2-0.0	22	mg/kg	1.0	0.16	1	B5G0334	07/17/2015	07/20/15	11:03	
1502441-04	B-2-1.0	6.9	mg/kg	1.0	0.16	1	B5G0334	07/17/2015	07/20/15	11:04	
1502441-05	B-3-0.0	28	mg/kg	1.0	0.16	1	B5G0334	07/17/2015	07/20/15	11:05	
1502441-06	B-3-1.0	20	mg/kg	1.0	0.16	1	B5G0334	07/17/2015	07/20/15	11:05	
1502441-07	B-3-2.5	4.7	mg/kg	1.0	0.16	1	B5G0334	07/17/2015	07/20/15	11:07	
1502441-08	B-3-3.5	3.5	mg/kg	1.0	0.16	1	B5G0334	07/17/2015	07/20/15	11:11	
1502441-09	B-4-0.0	27	mg/kg	1.0	0.16	1	B5G0334	07/17/2015	07/20/15	11:11	
1502441-10	B-4-1.0	45	mg/kg	1.0	0.16	1	B5G0334	07/17/2015	07/20/15	11:12	
1502441-11	B-4-2.5	3.0	mg/kg	1.0	0.16	1	B5G0334	07/17/2015	07/20/15	11:15	
1502441-12	B-4-3.5	2.4	mg/kg	1.0	0.16	1	B5G0334	07/17/2015	07/20/15	11:16	
1502441-13	B-5-0.0	43	mg/kg	1.0	0.16	1	B5G0334	07/17/2015	07/20/15	11:17	
1502441-14	B-5-1.0	6.4	mg/kg	1.0	0.16	1	B5G0334	07/17/2015	07/20/15	11:18	
1502441-15	B-5-2.5	2.4	mg/kg	1.0	0.16	1	B5G0334	07/17/2015	07/20/15	11:19	
1502441-16	B-5-3.5	2.5	mg/kg	1.0	0.16	1	B5G0334	07/17/2015	07/20/15	11:23	
1502441-17	B-6-0.0	31	mg/kg	1.0	0.16	1	B5G0334	07/17/2015	07/20/15	11:23	
1502441-18	B-6-1.0	9.6	mg/kg	1.0	0.16	1	B5G0334	07/17/2015	07/20/15	11:25	
1502441-19	B-6-2.5	2.5	mg/kg	1.0	0.16	1	B5G0334	07/17/2015	07/20/15	11:26	
1502441-20	B-6-3.5	3.2	mg/kg	1.0	0.16	1	B5G0334	07/17/2015	07/20/15	11:27	
1502441-21	B-8-0.0	32	mg/kg	1.0	0.16	1	B5G0335	07/17/2015	07/20/15	11:36	
1502441-22	B-8-1.0	20	mg/kg	1.0	0.16	1	B5G0335	07/17/2015	07/20/15	11:38	
1502441-23	B-8-2.5	2.6	mg/kg	1.0	0.16	1	B5G0335	07/17/2015	07/20/15	11:39	
1502441-24	B-8-3.5	2.5	mg/kg	1.0	0.16	1	B5G0335	07/17/2015	07/20/15	11:40	
1502441-25	B-9-0.0	44	mg/kg	1.0	0.16	1	B5G0335	07/17/2015	07/20/15	11:41	
1502441-26	B-9-1.0	3.6	mg/kg	1.0	0.16	1	B5G0335	07/17/2015	07/20/15	11:42	
1502441-27	B-9-2.5	2.8	mg/kg	0.99	0.16	1	B5G0335	07/17/2015	07/20/15	11:43	
1502441-28	B-9-3.5	3.3	mg/kg	1.0	0.16	1	B5G0335	07/17/2015	07/20/15	11:45	
1502441-29	B-10-0.0	28	mg/kg	1.0	0.16	1	B5G0335	07/17/2015	07/20/15	11:45	
1502441-30	B-10-1.0	4.9	mg/kg	1.0	0.16	1	B5G0335	07/17/2015	07/20/15	11:49	



Certificate of Analysis

Geocon West, Inc.
3303 N. San Fernando Blvd., Suite 100
Burbank , CA 91504

Project Number : State Route 405 ADL, S9890-06-10
Report To : Mike Conkle
Reported : 08/05/2015

Lead by ICP-AES EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1502441-31	B-10-2.5	3.9	mg/kg	1.0	0.16	1	B5G0335	07/17/2015	07/20/15	11:52	
1502441-32	B-10-3.5	3.2	mg/kg	1.0	0.16	1	B5G0335	07/17/2015	07/20/15	11:53	
1502441-33	B-11-0.0	22	mg/kg	1.0	0.16	1	B5G0335	07/17/2015	07/20/15	11:54	
1502441-34	B-11-1.0	37	mg/kg	1.0	0.16	1	B5G0335	07/17/2015	07/20/15	11:55	
1502441-35	B-11-2.5	6.9	mg/kg	1.0	0.16	1	B5G0335	07/17/2015	07/20/15	11:56	
1502441-36	B-11-3.5	7.6	mg/kg	1.0	0.16	1	B5G0335	07/17/2015	07/20/15	11:57	
1502441-37	B-12-0.0	13	mg/kg	1.0	0.16	1	B5G0335	07/17/2015	07/20/15	11:58	
1502441-38	B-12-1.0	190	mg/kg	1.0	0.16	1	B5G0335	07/17/2015	07/20/15	12:01	
1502441-39	B-12-2.5	3.6	mg/kg	1.0	0.16	1	B5G0335	07/17/2015	07/20/15	12:03	
1502441-40	B-12-3.5	2.7	mg/kg	1.0	0.16	1	B5G0335	07/17/2015	07/20/15	12:04	
1502441-41	B-13-0.0	25	mg/kg	1.0	0.16	1	B5G0336	07/17/2015	07/20/15	12:11	
1502441-42	B-13-1.0	14	mg/kg	1.0	0.16	1	B5G0336	07/17/2015	07/20/15	12:14	

TCLP Metals by ICP-AES EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1502441-38	B-12-1.0	0.0083	mg/L	0.050	0.0019	1	B5H0053	08/04/2015	08/04/15	13:14	J

STLC Metals by ICP-AES by EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1502441-01	B-1-0.0	1.2	mg/L	1.0	0.038	20	B5G0528	07/27/2015	07/27/15	10:23	
1502441-38	B-12-1.0	6.2	mg/L	1.0	0.038	20	B5G0528	07/27/2015	07/27/15	10:33	



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/05/2015

STLC DI Metals by ICP-AES by EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
1502441-38	B-12-1.0	0.14	mg/L	1.0	0.038	20	B5H0031	08/03/2015	08/03/15 15:07	J

pH by EPA 9045C

Analyte: pH

Analyst: LA

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
1502441-38	B-12-1.0	8.2	pH Units	0.10	0.10	1	B5H0068	08/04/2015	08/04/15 13:57	



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/05/2015

QUALITY CONTROL SECTION

Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5G0334 - EPA 3050 Modified_S									
Blank (B5G0334-BLK1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	ND	1.0							
Blank (B5G0334-BLK2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	0.216318	1.0							J
LCS (B5G0334-BS1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	49.1599	1.0	50.0000		98.3	80 - 120			
Duplicate (B5G0334-DUP1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	2.57803	1.0		3.15266	NR		20.1	20	R
Duplicate (B5G0334-DUP2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	39.5844	1.0		44.8876	NR		12.6	20	
Matrix Spike (B5G0334-MS1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	217.875	1.0	250.000	3.15266	85.9	35 - 129			
Matrix Spike (B5G0334-MS2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	278.969	1.0	250.000	44.8876	93.6	35 - 129			
Matrix Spike Dup (B5G0334-MSD1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	218.256	1.0	250.000	3.15266	86.0	35 - 129	0.175	20	



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/05/2015

Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5G0335 - EPA 3050 Modified_S									
Blank (B5G0335-BLK1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	ND	1.0			NR				
Blank (B5G0335-BLK2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	ND	1.0			NR				
LCS (B5G0335-BS1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	48.2065	1.0	50.0000		96.4	80 - 120			
Duplicate (B5G0335-DUP1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	2.82264	1.0		2.72367	NR		3.57	20	
Duplicate (B5G0335-DUP2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	3.85682	1.0		4.85553	NR		22.9	20	R
Matrix Spike (B5G0335-MS1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	217.118	1.0	250.000	2.72367	85.8	35 - 129			
Matrix Spike (B5G0335-MS2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	213.787	1.0	250.000	4.85553	83.6	35 - 129			
Matrix Spike Dup (B5G0335-MSD1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	219.368	1.0	250.000	2.72367	86.7	35 - 129	1.03	20	



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/05/2015

Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5G0336 - EPA 3050 Modified_S									
Blank (B5G0336-BLK1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	ND	1.0							NR
Blank (B5G0336-BLK2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	ND	1.0							NR
LCS (B5G0336-BS1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	48.7571	1.0	50.0000		97.5	80 - 120			
Duplicate (B5G0336-DUP1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	2.33645	1.0		1.82244			24.7	20	R
Duplicate (B5G0336-DUP2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	1.48335	1.0		1.54860			4.30	20	
Matrix Spike (B5G0336-MS1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	224.132	1.0	250.000	1.82244	88.9	35 - 129			
Matrix Spike (B5G0336-MS2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	229.359	1.0	252.525	1.54860	90.2	35 - 129			
Matrix Spike Dup (B5G0336-MSD1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	216.504	1.0	250.000	1.82244	85.9	35 - 129	3.46	20	



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/05/2015

TCLP Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
Batch B5H0053 - EPA 3010A_S								
Blank (B5H0053-BLK1)				Prepared: 8/4/2015 Analyzed: 8/4/2015				
Lead	ND	0.050			NR			
LCS (B5H0053-BS1)				Prepared: 8/4/2015 Analyzed: 8/4/2015				
Lead	0.972297	0.050	1.00000		97.2	80 - 120		
Duplicate (B5H0053-DUP1)				Prepared: 8/4/2015 Analyzed: 8/4/2015				
Lead	0.002573	0.050		0.008279	NR		105	20 R, J
Matrix Spike (B5H0053-MS1)				Prepared: 8/4/2015 Analyzed: 8/4/2015				
Lead	2.22988	0.050	2.50000	0.008279	88.9	77 - 121		
Matrix Spike Dup (B5H0053-MSD1)				Prepared: 8/4/2015 Analyzed: 8/4/2015				
Lead	2.22420	0.050	2.50000	0.008279	88.6	77 - 121	0.255	20



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/05/2015

STLC Metals by ICP-AES by EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
Batch B5G0528 - STLC_S Extraction								
Blank (B5G0528-BLK1)				Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	ND	1.0			NR			
Blank (B5G0528-BLK2)				Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	ND	1.0			NR			
LCS (B5G0528-BS1)				Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	1.91248		2.00000		95.6 80 - 120			
Duplicate (B5G0528-DUP1)				Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	1.59406		Source: 1502441-01 1.0	1.22026	NR	26.6	20	R
Duplicate (B5G0528-DUP2)				Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	43.8853		Source: 1502505-04 1.0	66.5185	NR	41.0	20	R
Matrix Spike (B5G0528-MS1)				Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	3.35665		Source: 1502441-01 2.50000	1.22026	85.5	44 - 130		
Matrix Spike (B5G0528-MS2)				Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	66.2859		Source: 1502505-04 2.50000	66.5185	-9.31	44 - 130		M1
Matrix Spike Dup (B5G0528-MSD1)				Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	3.45017		Source: 1502441-01 2.50000	1.22026	89.2	44 - 130	2.75	20



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/05/2015

STLC DI Metals by ICP-AES by EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5H0031 - STLC DI_S Extraction									
Blank (B5H0031-BLK1)				Prepared: 8/3/2015 Analyzed: 8/3/2015					
Lead	ND	1.0							NR
LCS (B5H0031-BS1)				Prepared: 8/3/2015 Analyzed: 8/3/2015					
Lead	2.06763		2.00000		103	80 - 120			
Duplicate (B5H0031-DUP1)				Source: 1502394-61 Prepared: 8/3/2015 Analyzed: 8/3/2015					
Lead	0.656493	1.0		0.408880	NR		46.5	20	R, J
Matrix Spike (B5H0031-MS1)				Source: 1502394-61 Prepared: 8/3/2015 Analyzed: 8/3/2015					
Lead	2.94387		2.50000	0.408880	101	70 - 130			
Matrix Spike Dup (B5H0031-MSD1)				Source: 1502394-61 Prepared: 8/3/2015 Analyzed: 8/3/2015					
Lead	2.92933		2.50000	0.408880	101	70 - 130	0.495	20	



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/05/2015

pH by EPA 9045C - Quality Control

Analyte	Result (pH Units)	PQL (pH Units)	Spike Level	Source Result	% Rec % Rec	% Rec Limits	RPD	RPD Limit	Notes
---------	----------------------	-------------------	----------------	------------------	----------------	-----------------	-----	--------------	-------

Batch B5H0068 - Prep_WC1_S

Duplicate (B5H0068-DUP1)

Source: 1502480-15

Prepared: 8/4/2015 Analyzed: 8/4/2015

pH	10.0100	0.10		9.33000	NR		7.03	20	
----	---------	------	--	---------	----	--	------	----	--



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/05/2015

Notes and Definitions

R	RPD value outside acceptance criteria. Calculation is based on raw values.
M1	Matrix spike recovery outside of acceptance limit. The analytical batch was validated by the laboratory control sample.
J	Analyte detected below the Practical Quantitation Limit but above or equal to the Method Detection Limit. Result is an estimated concentration.
ND	Analyte is not detected at or above the Practical Quantitation Limit (PQL). When client requests quantitation against MDL, analyte is not detected at or above the Method Detection Limit (MDL)
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
NR	Not Reported
RPD	Relative Percent Difference
CA2	CA-ELAP (CDPH)
OR1	OR-NELAP (OSPHL)
TX1	TX-NELAP (TCEQ)

Notes:

- (1) The reported MDL and PQL are based on prep ratio variation and analytical dilution.
- (2) The suffix [2C] of specific analytes signifies that the reported result is taken from the instrument's second column.
- (3) Results are wet unless otherwise specified.

CHAIN OF CUSTODY RECORD

 <p>Advanced Technology Laboratories 3275 Walnut Avenue Signal Hill, CA 90755 Tel: (562) 989-4045 • Fax: (562) 989-4040</p>		FOR LABORATORY USE ONLY										
		P.O. #: _____ Logged By: _____ Date: _____		Method of Transport Client <input type="checkbox"/> ATL <input checked="" type="checkbox"/> CA OverN <input type="checkbox"/> FedEx <input type="checkbox"/> Other: _____		Sample Condition Upon Receipt 1. CHILLED <input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> 4. SEALED <input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> 2. HEADSPACE (VOA) <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> 5. # OF SPLS MATCH COC <input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> 3. CONTAINER INTACT <input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> 6. PRESERVED <input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/>						
Client: Geocon Attention: Mike Conkle		Address: 3303 North San Fernando Blvd Suite 100 City: Burbank State: CA Zip Code: 91504		Tel: 818-841-8388 Fax: 818-841-1704								
Project Name: State Route 405 ADP Relinquished by: (Signature and Printed Name) <i>Mike Alcala</i> Date: 7/14/15 Time: 1600 Relinquished by: (Signature and Printed Name) <i>Edward Rodriguez</i> Date: 7-14-15 Time: 1715 Relinquished by: (Signature and Printed Name) _____ Date: _____ Time: _____		Project #: S9890-06-10 Sampler: <i>Mike Alcala</i> (Signature) _____ Received by: (Signature and Printed Name) <i>Edward Rodriguez</i> Date: 7-14-15 Time: 1600 Received by: (Signature and Printed Name) <i>Edward Rodriguez</i> Date: 7/14/15 Time: 1715		Special Instructions/Comments: CT Contract 12A1535 Run samples with total lead greater than or equal to 50 mg/kg by WET. Run samples with WET results greater than or equal to 5.0 mg/l by DI-WET. Run samples with total lead greater than or equal to 1,000 mg/kg for TCLP only								
I hereby authorize ATL to perform the work indicated below: Project Mgr /Submitter: <i>Mike Conkle</i> Date: 7/14/15 Print Name: <i>Mike Alcala</i> Signature: _____		Send Report To: Attn: Mike Conkle Co: Geocon Consultants Inc. Addr: 3303 North San Fernando Blvd Suite 100 City: Burbank State: CA Zip: 91504		Bill To: Attn: Mike Conkle Co: Geocon Consultants Inc. Addr: 3303 North San Fernando Blvd Suite 100 City: Burbank State: CA Zip: 91504								
Sample/Records - Archival & Disposal Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report. Storage Fees (applies when storage is requested): ■ Sample :\$2.00 / sample /mo (after 45 days) ■ Records: \$1 /ATL workorder /mo (after 1 year)		Circle or Add Analysis(es) Requested		SPECIFY APPROPRIATE MATRIX								
				Soil	Water	Ground Water	Wastewater	TAT	#	Type	Container(s)	REMARKS
I T E M	LAB USE ONLY: Lab No.	Sample Description Sample ID / Location	Date	Time	Lead							
	1502441 - 01	B-1-0.0	7/14/15	1022	x				E	1	G J	
	- 2	B-1-1.0		1027	x				E	1	G J	
	- 3	B-2-0.0		1039	x				E	1	G J	
	- 4	B-2-1.0		1041	x				E	1	G J	
	- 5	B-3-0.0		1046	x				E	1	G J	
	- 6	B-3-1.0		1048	x				E	1	G J	
	- 7	B-3-2.5		1050	x				E	1	G J	
	- 8	B-3-3.5		1053	x				E	1	G J	
	- 9	B-4-0.0		1059	x				E	1	G J	
	- 10	B-4-1.0		1101	x				E	1	G J	
	- 11	B-4-2.5		1103	x				E	1	G J	
	- 12	B-4-3.5		1106	x				E	1	G J	
	- 13	B-5-0.0		1115	x				E	1	G J	
	- 14	B-5-1.0		1117	x				E	1	G J	
	- 15	B-5-2.5		1121	x				E	1	G J	
	- 16	B-5-3.5		1123	x				E	1	G J	
	- 17	B-6-0.0		1127	x				E	1	G J	
	- 18	B-6-1.0		1135	x				E	1	G J	
	- 19	B-6-2.5		1137	x				E	1	G J	
	- 20	B-6-3.5		1139	x				E	1	G J	
■ TAT starts 8AM the following day if samples received after 3 PM		TAT: <input type="checkbox"/> A = Overnight ≤ 24 hrs <input type="checkbox"/> B = Emergency Next Workday <input type="checkbox"/> C = Critical 2 Workdays <input type="checkbox"/> D = Urgent 3 Workdays <input checked="" type="checkbox"/> E = Routine 7 Workdays		Preservatives: H=HCl N=HNO ₃ S=H ₂ SO ₄ C=4°C Z=Zn(AC) ₂ O=NaOH T=Na ₂ S ₂ O ₃								
		Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal										

CHAIN OF CUSTODY RECORD

 <p>Advanced Technology Laboratories 3275 Walnut Avenue Signal Hill, CA 90755 Tel: (562) 989-4045 • Fax: (562) 989-4040</p>		FOR LABORATORY USE ONLY																																																																																																																																																																																																																																																																																		
		Method of Transport Client <input type="checkbox"/> ATL <input checked="" type="checkbox"/> CA OverN <input type="checkbox"/> FedEx <input type="checkbox"/> Other: _____ P.O. #: _____ Logged By: _____ Date: _____																																																																																																																																																																																																																																																																																		
Client: Geocon Attention: Mike Conkle		Address: 3303 North San Fernando Blvd Suite 100 City: Burbank State: CA Zip Code: 91504 Tel: 818-841-8388 Fax: 818-841-1704																																																																																																																																																																																																																																																																																		
Project Name: State Route 405 A Relinquished by: (Signature and Printed Name) <u>Mike Alcala</u> Date: <u>7/14/15</u> Time: <u>1600</u>		Project #: S9890-06-10 Sampler: <u>Mike Alcala</u> (Signature) Received by: (Signature and Printed Name) <u>Edmund Rodriguez</u> Date: <u>7-14-15</u> Time: <u>1600</u>																																																																																																																																																																																																																																																																																		
Relinquished by: (Signature and Printed Name) <u>Edmund Rodriguez</u> Date: <u>7-14-15</u> Time: <u>1715</u>		Received by: (Signature and Printed Name) <u>Edmund Rodriguez</u> Date: <u>7/14/15</u> Time: <u>1715</u>																																																																																																																																																																																																																																																																																		
I hereby authorize ATL to perform the work indicated below: Project Mgr /Submitter: <u>Mike Conkle</u> Date: <u>7/14/15</u> Print Name: <u>Mike Alcala</u> Signature: _____		Send Report To: Attn: <u>Mike Conkle</u> Co: <u>Geocon Consultants Inc.</u> Addr: 3303 North San Fernando Blvd Suite 100 City: Burbank State: CA Zip: 91504																																																																																																																																																																																																																																																																																		
Special Instructions/Comments: CT Contract 12A1535 Run samples with total lead greater than or equal to 50 mg/kg by WET. Run samples with WET results greater than or equal to 5.0 mg/l by DI-WET. Run samples with total lead greater than or equal to 1,000 mg/kg for TCLP only		Bill To: Attn: <u>Mike Conkle</u> Co: <u>Geocon Consultants Inc.</u> Addr: 3303 North San Fernando Blvd Suite 100 City: Burbank State: CA Zip: 91504																																																																																																																																																																																																																																																																																		
Sample/Records - Archival & Disposal Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report. Storage Fees (applies when storage is requested): ■ Sample :\$2.00 / sample /mo (after 45 days) ■ Records: \$1 /ATL workorder /mo (after 1 year)		Circle or Add Analysis(es) Requested SPECIFY APPROPRIATE MATRIX SOIL WATER GROUND WATER WASTEWATER TAT # Type Container(s)																																																																																																																																																																																																																																																																																		
LAB USE ONLY: Lab No. Sample ID / Location Date Time		Circle or Add Analysis(es) Requested SPECIFY APPROPRIATE MATRIX SOIL WATER GROUND WATER WASTEWATER TAT # Type Container(s)																																																																																																																																																																																																																																																																																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>LAB USE ONLY:</th> <th>Sample Description</th> <th>Date</th> <th>Time</th> <th>Lead</th> <th>SOIL</th> <th>WATER</th> <th>GROUND WATER</th> <th>WASTEWATER</th> <th>TAT</th> <th>#</th> <th>Type</th> <th>REMARKS</th> </tr> </thead> <tbody> <tr><td>1502441-21</td><td>B-8-0.0</td><td>7/14/15</td><td>1149</td><td>x</td><td></td><td>x</td><td></td><td></td><td>E</td><td>1</td><td>G J</td><td></td></tr> <tr><td>-22</td><td>B-8-1.0</td><td></td><td>1153</td><td>x</td><td>x</td><td></td><td></td><td></td><td>E</td><td>1</td><td>G J</td><td></td></tr> <tr><td>-23</td><td>B-8-2.5</td><td></td><td>1200</td><td>x</td><td>x</td><td></td><td></td><td></td><td>E</td><td>1</td><td>G J</td><td></td></tr> <tr><td>-24</td><td>B-8-3.5</td><td></td><td>1202</td><td>x</td><td>x</td><td></td><td></td><td></td><td>E</td><td>1</td><td>G J</td><td></td></tr> <tr><td>-25</td><td>B-9-0.0</td><td></td><td>1211</td><td>x</td><td>x</td><td></td><td></td><td></td><td>E</td><td>1</td><td>G J</td><td></td></tr> <tr><td>-26</td><td>B-9-1.0</td><td></td><td>1213</td><td>x</td><td>x</td><td></td><td></td><td></td><td>E</td><td>1</td><td>G J</td><td></td></tr> <tr><td>-27</td><td>B-9-2.5</td><td></td><td>1215</td><td>x</td><td>x</td><td></td><td></td><td></td><td>E</td><td>1</td><td>G J</td><td></td></tr> <tr><td>-28</td><td>B-9-3.5</td><td></td><td>1217</td><td>x</td><td>x</td><td></td><td></td><td></td><td>E</td><td>1</td><td>G J</td><td></td></tr> <tr><td>-29</td><td>B-10-0.0</td><td></td><td>1223</td><td>x</td><td>x</td><td></td><td></td><td></td><td>E</td><td>1</td><td>G J</td><td></td></tr> <tr><td>-30</td><td>B-10-1.0</td><td></td><td>1225</td><td>x</td><td>x</td><td></td><td></td><td></td><td>E</td><td>1</td><td>G J</td><td></td></tr> <tr><td>-31</td><td>B-10-2.5</td><td></td><td>1228</td><td>x</td><td>x</td><td></td><td></td><td></td><td>E</td><td>1</td><td>G J</td><td></td></tr> <tr><td>-32</td><td>B-10-3.5</td><td></td><td>1230</td><td>x</td><td>x</td><td></td><td></td><td></td><td>E</td><td>1</td><td>G J</td><td></td></tr> <tr><td>-33</td><td>B-11-0.0</td><td></td><td>1236</td><td>x</td><td>x</td><td></td><td></td><td></td><td>E</td><td>1</td><td>G J</td><td></td></tr> <tr><td>-34</td><td>B-11-1.0</td><td></td><td>1239</td><td>x</td><td>x</td><td></td><td></td><td></td><td>E</td><td>1</td><td>G J</td><td></td></tr> <tr><td>-35</td><td>B-11-2.5</td><td></td><td>1241</td><td>x</td><td>x</td><td></td><td></td><td></td><td>E</td><td>1</td><td>G J</td><td></td></tr> <tr><td>-36</td><td>B-11-3.5</td><td></td><td>1244</td><td>x</td><td>x</td><td></td><td></td><td></td><td>E</td><td>1</td><td>G J</td><td></td></tr> <tr><td>-37</td><td>B-12-0.0</td><td></td><td>1255</td><td>x</td><td>x</td><td></td><td></td><td></td><td>E</td><td>1</td><td>G J</td><td></td></tr> <tr><td>-38</td><td>B-12-1.0</td><td></td><td>1257</td><td>x</td><td>x</td><td></td><td></td><td></td><td>E</td><td>1</td><td>G J</td><td></td></tr> <tr><td>-39</td><td>B-12-2.5</td><td></td><td>1300</td><td>x</td><td>x</td><td></td><td></td><td></td><td>E</td><td>1</td><td>G J</td><td></td></tr> <tr><td>-40</td><td>B-12-3.5</td><td></td><td>1302</td><td>x</td><td>x</td><td></td><td></td><td></td><td>E</td><td>1</td><td>G J</td><td></td></tr> </tbody> </table>		LAB USE ONLY:	Sample Description	Date	Time	Lead	SOIL	WATER	GROUND WATER	WASTEWATER	TAT	#	Type	REMARKS	1502441-21	B-8-0.0	7/14/15	1149	x		x			E	1	G J		-22	B-8-1.0		1153	x	x				E	1	G J		-23	B-8-2.5		1200	x	x				E	1	G J		-24	B-8-3.5		1202	x	x				E	1	G J		-25	B-9-0.0		1211	x	x				E	1	G J		-26	B-9-1.0		1213	x	x				E	1	G J		-27	B-9-2.5		1215	x	x				E	1	G J		-28	B-9-3.5		1217	x	x				E	1	G J		-29	B-10-0.0		1223	x	x				E	1	G J		-30	B-10-1.0		1225	x	x				E	1	G J		-31	B-10-2.5		1228	x	x				E	1	G J		-32	B-10-3.5		1230	x	x				E	1	G J		-33	B-11-0.0		1236	x	x				E	1	G J		-34	B-11-1.0		1239	x	x				E	1	G J		-35	B-11-2.5		1241	x	x				E	1	G J		-36	B-11-3.5		1244	x	x				E	1	G J		-37	B-12-0.0		1255	x	x				E	1	G J		-38	B-12-1.0		1257	x	x				E	1	G J		-39	B-12-2.5		1300	x	x				E	1	G J		-40	B-12-3.5		1302	x	x				E	1	G J		TAT: <input type="checkbox"/> A = Overnight ≤ 24 hrs <input type="checkbox"/> B = Emergency Next Workday <input type="checkbox"/> C = Critical 2 Workdays <input type="checkbox"/> D = Urgent 3 Workdays <input checked="" type="checkbox"/> E = Routine 7 Workdays Preservatives: H=HCl N=HNO ₃ S=H ₂ SO ₄ C=4°C Z=Zn(Ac) ₂ O=NaOH T=Na ₂ S ₂ O ₃ Container Types: T=Tube V=VOA L=Liter P=Pinnt J=Jar B=Tedlar G=Glass P=Plastic M=Metal	
LAB USE ONLY:	Sample Description	Date	Time	Lead	SOIL	WATER	GROUND WATER	WASTEWATER	TAT	#	Type	REMARKS																																																																																																																																																																																																																																																																								
1502441-21	B-8-0.0	7/14/15	1149	x		x			E	1	G J																																																																																																																																																																																																																																																																									
-22	B-8-1.0		1153	x	x				E	1	G J																																																																																																																																																																																																																																																																									
-23	B-8-2.5		1200	x	x				E	1	G J																																																																																																																																																																																																																																																																									
-24	B-8-3.5		1202	x	x				E	1	G J																																																																																																																																																																																																																																																																									
-25	B-9-0.0		1211	x	x				E	1	G J																																																																																																																																																																																																																																																																									
-26	B-9-1.0		1213	x	x				E	1	G J																																																																																																																																																																																																																																																																									
-27	B-9-2.5		1215	x	x				E	1	G J																																																																																																																																																																																																																																																																									
-28	B-9-3.5		1217	x	x				E	1	G J																																																																																																																																																																																																																																																																									
-29	B-10-0.0		1223	x	x				E	1	G J																																																																																																																																																																																																																																																																									
-30	B-10-1.0		1225	x	x				E	1	G J																																																																																																																																																																																																																																																																									
-31	B-10-2.5		1228	x	x				E	1	G J																																																																																																																																																																																																																																																																									
-32	B-10-3.5		1230	x	x				E	1	G J																																																																																																																																																																																																																																																																									
-33	B-11-0.0		1236	x	x				E	1	G J																																																																																																																																																																																																																																																																									
-34	B-11-1.0		1239	x	x				E	1	G J																																																																																																																																																																																																																																																																									
-35	B-11-2.5		1241	x	x				E	1	G J																																																																																																																																																																																																																																																																									
-36	B-11-3.5		1244	x	x				E	1	G J																																																																																																																																																																																																																																																																									
-37	B-12-0.0		1255	x	x				E	1	G J																																																																																																																																																																																																																																																																									
-38	B-12-1.0		1257	x	x				E	1	G J																																																																																																																																																																																																																																																																									
-39	B-12-2.5		1300	x	x				E	1	G J																																																																																																																																																																																																																																																																									
-40	B-12-3.5		1302	x	x				E	1	G J																																																																																																																																																																																																																																																																									

Diane Galvan

From: Mike Conkle [conkle@geoconinc.com]
Sent: Wednesday, July 29, 2015 2:31 PM
To: Diane Galvan
Subject: State Route 405 ADL

Diane,

For this project please also run TCLP soluble lead and pH on all results with WET soluble lead concentrations greater than or equal to 5.0 mg/l.



Michael P. Conkle, PG | *Senior Geologist*
Geocon

3303 N. San Fernando Blvd. Suite 100, Burbank, CA 91504

Tel 818.841.8388 Fax 818.841.1704 Cell 213.503.7841

Visit our NEW website at www.geoconinc.com

San Diego / Los Angeles / Irvine / Murrieta / Palm Desert / Sacramento / Livermore / Bakersfield



July 30, 2015

Mike Conkle
Geocon West, Inc.
3303 N. San Fernando Blvd., Suite 100
Burbank, CA 91504
Tel: (818) 841-8388
Fax:(818) 841-1704

ELAP No.: 1838
CSDLAC No.: 10196
ORELAP No.: CA300003
TCEQ No. : T104704502

Re: ATL Work Order Number : 1502453
Client Reference : State Route 405 ADL, S9890-06-10

Enclosed are the results for sample(s) received on July 15, 2015 by Advanced Technology Laboratories. The sample(s) are tested for the parameters as indicated on the enclosed chain of custody in accordance with applicable laboratory certifications. The laboratory results contained in this report specifically pertains to the sample(s) submitted.

Thank you for the opportunity to serve the needs of your company. If you have any questions, please feel free to contact me or your Project Manager.

Sincerely,

A handwritten signature in black ink, appearing to read 'E. Rodriguez', is written over a light gray rectangular background.

Eddie Rodriguez
Laboratory Director

The cover letter and the case narrative are an integral part of this analytical report and its absence renders the report invalid. Test results contained within this data package meet the requirements of applicable state-specific certification programs. The report cannot be reproduced without written permission from the client and Advanced Technology Laboratories.

3275 Walnut Avenue, Signal Hill, CA 90755 • Tel: 562-989-4045 • Fax: 562-989-4040
www.atlglobal.com



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 07/30/2015

SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B-14-0.0	1502453-01	Soil	7/15/15 7:55	7/15/15 16:00
B-14-1.0	1502453-02	Soil	7/15/15 7:58	7/15/15 16:00
B-15-0.0	1502453-03	Soil	7/15/15 8:12	7/15/15 16:00
B-15-1.0	1502453-04	Soil	7/15/15 8:17	7/15/15 16:00
B-16-0.0	1502453-05	Soil	7/15/15 8:34	7/15/15 16:00
B-16-1.0	1502453-06	Soil	7/15/15 8:42	7/15/15 16:00
B-17-0.0	1502453-07	Soil	7/15/15 9:18	7/15/15 16:00
B-17-1.0	1502453-08	Soil	7/15/15 9:20	7/15/15 16:00
B-18-0.0	1502453-09	Soil	7/15/15 9:40	7/15/15 16:00
B-18-1.0	1502453-10	Soil	7/15/15 9:46	7/15/15 16:00
B-18-2.5	1502453-11	Soil	7/15/15 9:49	7/15/15 16:00
B-18-3.5	1502453-12	Soil	7/15/15 9:52	7/15/15 16:00
B-19-0.0	1502453-13	Soil	7/15/15 9:54	7/15/15 16:00
B-19-1.0	1502453-14	Soil	7/15/15 9:57	7/15/15 16:00
B-20-0.0	1502453-15	Soil	7/15/15 10:14	7/15/15 16:00
B-20-1.0	1502453-16	Soil	7/15/15 10:18	7/15/15 16:00
B-21-0.0	1502453-17	Soil	7/15/15 10:31	7/15/15 16:00
B-21-1.0	1502453-18	Soil	7/15/15 10:34	7/15/15 16:00
B-22-0.0	1502453-19	Soil	7/15/15 10:49	7/15/15 16:00
B-22-1.0	1502453-20	Soil	7/15/15 10:52	7/15/15 16:00
B-22-2.5	1502453-21	Soil	7/15/15 10:57	7/15/15 16:00
B-22-3.5	1502453-22	Soil	7/15/15 11:00	7/15/15 16:00
B-23-0.0	1502453-23	Soil	7/15/15 12:02	7/15/15 16:00
B-23-1.0	1502453-24	Soil	7/15/15 12:08	7/15/15 16:00
B-23-2.5	1502453-25	Soil	7/15/15 12:12	7/15/15 16:00
B-23-3.5	1502453-26	Soil	7/15/15 12:15	7/15/15 16:00
B-24-0.0	1502453-27	Soil	7/15/15 12:19	7/15/15 16:00
B-24-1.0	1502453-28	Soil	7/15/15 12:22	7/15/15 16:00
B-24-2.5	1502453-29	Soil	7/15/15 12:27	7/15/15 16:00
B-24-3.5	1502453-30	Soil	7/15/15 12:31	7/15/15 16:00
B-25-0.0	1502453-31	Soil	7/15/15 12:42	7/15/15 16:00
B-25-1.0	1502453-32	Soil	7/15/15 12:45	7/15/15 16:00
B-25-2.5	1502453-33	Soil	7/15/15 12:49	7/15/15 16:00
B-26-0.0	1502453-34	Soil	7/15/15 13:10	7/15/15 16:00



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 07/30/2015

B-26-1.0	1502453-35	Soil	7/15/15 13:18	7/15/15 16:00
B-26-2.5	1502453-36	Soil	7/15/15 13:23	7/15/15 16:00
B-26-3.5	1502453-37	Soil	7/15/15 13:31	7/15/15 16:00
B-27-0.0	1502453-38	Soil	7/15/15 13:34	7/15/15 16:00
B-27-1.0	1502453-39	Soil	7/15/15 13:38	7/15/15 16:00
B-27-2.5	1502453-40	Soil	7/15/15 13:41	7/15/15 16:00
B-27-3.5	1502453-41	Soil	7/15/15 13:46	7/15/15 16:00

CASE NARRATIVE

Results were J-flagged. "J" is used to flag those results that are between the PQL (Practical Quantitation Limit) and the calculated MDL (Method Detection Limit). Results that are "J" flagged are estimated values since it becomes difficult to accurately quantitate the analyte near the MDL.



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 07/30/2015

Lead by ICP-AES EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1502453-01	B-14-0.0	49	mg/kg	1.0	0.16	1	B5G0338	07/17/2015	07/20/15	13:29	
1502453-02	B-14-1.0	18	mg/kg	1.0	0.16	1	B5G0338	07/17/2015	07/20/15	13:30	
1502453-03	B-15-0.0	150	mg/kg	1.0	0.16	1	B5G0338	07/17/2015	07/20/15	13:31	
1502453-04	B-15-1.0	29	mg/kg	1.0	0.16	1	B5G0338	07/17/2015	07/20/15	13:31	
1502453-05	B-16-0.0	18	mg/kg	1.0	0.16	1	B5G0338	07/17/2015	07/20/15	13:35	
1502453-06	B-16-1.0	38	mg/kg	1.0	0.16	1	B5G0338	07/17/2015	07/20/15	13:36	
1502453-07	B-17-0.0	27	mg/kg	1.0	0.16	1	B5G0338	07/17/2015	07/20/15	13:37	
1502453-08	B-17-1.0	49	mg/kg	1.0	0.16	1	B5G0338	07/17/2015	07/20/15	13:38	
1502453-09	B-18-0.0	36	mg/kg	1.0	0.16	1	B5G0338	07/17/2015	07/20/15	13:38	
1502453-10	B-18-1.0	24	mg/kg	1.0	0.16	1	B5G0338	07/17/2015	07/20/15	13:40	
1502453-11	B-18-2.5	3.0	mg/kg	1.0	0.16	1	B5G0338	07/17/2015	07/20/15	13:43	
1502453-12	B-18-3.5	2.8	mg/kg	1.0	0.16	1	B5G0338	07/17/2015	07/20/15	13:44	
1502453-13	B-19-0.0	44	mg/kg	1.0	0.16	1	B5G0338	07/17/2015	07/20/15	13:47	
1502453-14	B-19-1.0	17	mg/kg	1.0	0.16	1	B5G0338	07/17/2015	07/20/15	13:48	
1502453-15	B-20-0.0	19	mg/kg	1.0	0.16	1	B5G0338	07/17/2015	07/20/15	13:49	
1502453-16	B-20-1.0	54	mg/kg	1.0	0.16	1	B5G0338	07/17/2015	07/20/15	13:50	
1502453-17	B-21-0.0	20	mg/kg	1.0	0.16	1	B5G0338	07/17/2015	07/20/15	13:51	
1502453-18	B-21-1.0	42	mg/kg	1.0	0.16	1	B5G0338	07/17/2015	07/20/15	13:52	
1502453-19	B-22-0.0	11	mg/kg	1.0	0.16	1	B5G0338	07/17/2015	07/20/15	13:53	
1502453-20	B-22-1.0	19	mg/kg	1.0	0.16	1	B5G0338	07/17/2015	07/20/15	13:54	
1502453-21	B-22-2.5	32	mg/kg	1.0	0.16	1	B5G0339	07/17/2015	07/20/15	14:03	
1502453-22	B-22-3.5	22	mg/kg	1.0	0.16	1	B5G0339	07/17/2015	07/20/15	14:04	
1502453-23	B-23-0.0	20	mg/kg	1.0	0.16	1	B5G0339	07/17/2015	07/20/15	14:05	
1502453-24	B-23-1.0	10	mg/kg	1.0	0.16	1	B5G0339	07/17/2015	07/20/15	14:07	
1502453-25	B-23-2.5	7.6	mg/kg	1.0	0.16	1	B5G0339	07/17/2015	07/20/15	14:08	
1502453-26	B-23-3.5	2.8	mg/kg	1.0	0.16	1	B5G0339	07/17/2015	07/20/15	14:09	
1502453-27	B-24-0.0	16	mg/kg	1.0	0.16	1	B5G0339	07/17/2015	07/20/15	14:13	
1502453-28	B-24-1.0	13	mg/kg	1.0	0.16	1	B5G0339	07/17/2015	07/20/15	14:14	
1502453-29	B-24-2.5	11	mg/kg	1.0	0.16	1	B5G0339	07/17/2015	07/20/15	14:15	
1502453-30	B-24-3.5	10	mg/kg	1.0	0.16	1	B5G0339	07/17/2015	07/20/15	14:15	



Certificate of Analysis

Geocon West, Inc.
3303 N. San Fernando Blvd., Suite 100
Burbank , CA 91504

Project Number : State Route 405 ADL, S9890-06-10
Report To : Mike Conkle
Reported : 07/30/2015

Lead by ICP-AES EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analalyzed		
1502453-31	B-25-0.0	15	mg/kg	1.0	0.16	1	B5G0339	07/17/2015	07/20/15 14:18		
1502453-32	B-25-1.0	12	mg/kg	1.0	0.16	1	B5G0339	07/17/2015	07/20/15 14:19		
1502453-33	B-25-2.5	12	mg/kg	1.0	0.16	1	B5G0339	07/17/2015	07/20/15 14:20		
1502453-34	B-26-0.0	20	mg/kg	1.0	0.16	1	B5G0339	07/17/2015	07/20/15 14:21		
1502453-35	B-26-1.0	9.7	mg/kg	1.0	0.16	1	B5G0339	07/17/2015	07/20/15 14:25		
1502453-36	B-26-2.5	8.7	mg/kg	1.0	0.16	1	B5G0339	07/17/2015	07/20/15 14:26		
1502453-37	B-26-3.5	9.1	mg/kg	1.0	0.16	1	B5G0339	07/17/2015	07/20/15 14:27		
1502453-38	B-27-0.0	11	mg/kg	1.0	0.16	1	B5G0339	07/17/2015	07/20/15 14:28		
1502453-39	B-27-1.0	13	mg/kg	1.0	0.16	1	B5G0339	07/17/2015	07/20/15 14:29		
1502453-40	B-27-2.5	19	mg/kg	1.0	0.16	1	B5G0339	07/17/2015	07/20/15 14:30		
1502453-41	B-27-3.5	16	mg/kg	0.99	0.16	1	B5G0340	07/17/2015	07/20/15 14:38		

STLC Metals by ICP-AES by EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analalyzed		
1502453-03	B-15-0.0	1.7	mg/L	1.0	0.038	20	B5G0528	07/27/2015	07/27/15 10:35		
1502453-16	B-20-1.0	1.6	mg/L	1.0	0.038	20	B5G0528	07/27/2015	07/27/15 10:37		



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 07/30/2015

QUALITY CONTROL SECTION

Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5G0338 - EPA 3050 Modified_S									
Blank (B5G0338-BLK1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	ND	1.0							NR
Blank (B5G0338-BLK2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	ND	1.0							NR
LCS (B5G0338-BS1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	48.8090	1.0	50.0000		97.6	80 - 120			
Duplicate (B5G0338-DUP1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	17.7275	1.0		18.6862	NR		5.27	20	
Duplicate (B5G0338-DUP2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	19.7624	1.0		24.4087	NR		21.0	20	R
Matrix Spike (B5G0338-MS1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	237.055	1.0	250.000	18.6862	87.3	35 - 129			
Matrix Spike (B5G0338-MS2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	240.530	1.0	250.000	24.4087	86.4	35 - 129			
Matrix Spike Dup (B5G0338-MSD1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	234.667	1.0	250.000	18.6862	86.4	35 - 129	1.01	20	



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 07/30/2015

Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5G0339 - EPA 3050 Modified_S									
Blank (B5G0339-BLK1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	ND	1.0					NR		
Blank (B5G0339-BLK2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	ND	1.0					NR		
LCS (B5G0339-BS1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	49.2443	1.0	50.0000		98.5	80 - 120			
Duplicate (B5G0339-DUP1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	26.8126	1.0		19.3874	NR		32.1	20	R
Duplicate (B5G0339-DUP2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	10.6165	1.0		10.3119	NR		2.91	20	
Matrix Spike (B5G0339-MS1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	243.014	1.0	250.000	19.3874	89.5	35 - 129			
Matrix Spike (B5G0339-MS2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	208.936	1.0	250.000	10.3119	79.4	35 - 129			
Matrix Spike Dup (B5G0339-MSD1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	250.210	1.0	250.000	19.3874	92.3	35 - 129	2.92	20	



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 07/30/2015

Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
Batch B5G0340 - EPA 3050 Modified_S								
Blank (B5G0340-BLK1)								
Lead	ND	1.0						Prepared: 7/17/2015 Analyzed: 7/20/2015 NR
LCS (B5G0340-BS1)								
Lead	48.8750	1.0	50.0000		97.8	80 - 120		Prepared: 7/17/2015 Analyzed: 7/20/2015
Duplicate (B5G0340-DUP1)								
Lead	20.0812	1.0		16.2635	NR		21.0	20
Matrix Spike (B5G0340-MS1)								
Lead	210.138	1.0	250.000	16.2635	77.5	35 - 129		Prepared: 7/17/2015 Analyzed: 7/20/2015
Matrix Spike Dup (B5G0340-MSD1)								
Lead	220.163	1.0	250.000	16.2635	81.6	35 - 129	4.66	20



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 07/30/2015

STLC Metals by ICP-AES by EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5G0528 - STLC_S Extraction									
Blank (B5G0528-BLK1)					Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	ND	1.0			NR				
Blank (B5G0528-BLK2)					Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	ND	1.0			NR				
LCS (B5G0528-BS1)					Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	1.91248		2.00000		95.6	80 - 120			
Duplicate (B5G0528-DUP1)					Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	1.59406		1.0	1.22026	NR		26.6	20	R
Duplicate (B5G0528-DUP2)					Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	43.8853		1.0	66.5185	NR		41.0	20	R
Matrix Spike (B5G0528-MS1)					Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	3.35665		2.50000	1.22026	85.5	44 - 130			
Matrix Spike (B5G0528-MS2)					Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	66.2859		2.50000	66.5185	-9.31	44 - 130			M1
Matrix Spike Dup (B5G0528-MSD1)					Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	3.45017		2.50000	1.22026	89.2	44 - 130	2.75	20	



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 07/30/2015

Notes and Definitions

R	RPD value outside acceptance criteria. Calculation is based on raw values.
M1	Matrix spike recovery outside of acceptance limit. The analytical batch was validated by the laboratory control sample.
ND	Analyte is not detected at or above the Practical Quantitation Limit (PQL). When client requests quantitation against MDL, analyte is not detected at or above the Method Detection Limit (MDL)
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
NR	Not Reported
RPD	Relative Percent Difference
CA2	CA-ELAP (CDPH)
OR1	OR-NELAP (OSPHL)
TX1	TX-NELAP (TCEQ)

Notes:

- (1) The reported MDL and PQL are based on prep ratio variation and analytical dilution.
- (2) The suffix [2C] of specific analytes signifies that the reported result is taken from the instrument's second column.
- (3) Results are wet unless otherwise specified.

CHAIN OF CUSTODY RECORD



**Advanced Technology
Laboratories**

3275 Walnut Avenue
Signal Hill, CA 90755
Tel: (562) 989-4045 • Fax: (562) 989-4040

FOR LABORATORY USE ONLY

P.O. #: _____
Logged By: _____ Date: _____

Method of Transport
Client
ATL
CA OverN
FedEx
Other: _____

Sample Condition Upon Receipt
1. CHILLED Y N 4. SEALED Y N
2. HEADSPACE (VOA) Y N 5. # OF SPLS MATCH COC Y N
3. CONTAINER INTACT Y N 6. PRESERVED Y N

Client: Geocon Address: 3303 North San Fernando Blvd Suite 100 Tel: 818-841-8388
Attention: Mike Conkle City: Burbank State: CA Zip Code: 91504 Fax: 818-841-1704

Project Name: State Route 405 ADI Project #: S9890-06-10 Sampler: *Mike Jacobs* (Signature)

Relinquished by: (Signature and Printed Name) *Mike Jacobs* Date: 7/15/15 Time: 1600 Received by: (Signature and Printed Name) *Janice Frown* Date: 7/15/15 Time: 1600

Relinquished by: (Signature and Printed Name) *Janice Frown* Date: 7/15/15 Time: 1726 Received by: (Signature and Printed Name) *Janice Frown* Date: 7/15/15 Time: 1726

Relinquished by: (Signature and Printed Name) _____ Date: _____ Time: _____ Received by: (Signature and Printed Name) _____ Date: _____ Time: _____

I hereby authorize ATL to perform the work indicated below:
Project Mgr /Submitter: Mike Conkle
Print Name: *Mike Conkle* Date: 7/15/15
Signature: *Mike Conkle*

Send Report To:
Attn: Mike Conkle
Co: Geocon Consultants Inc.
Addr: 3303 North San Fernando Blvd Suite 100
City: Burbank State: CA Zip: 91504

Bill To:
Attn: Mike Conkle
Co: Geocon Consultants Inc.
Addr: 3303 North San Fernando Blvd Suite 100
City: Burbank State: CA Zip: 91504

Special Instructions/Comments:
CT Contract 12A1535 Run samples with total lead greater than or equal to 50 mg/kg by WET. Run samples with WET results greater than or equal to 5.0 mg/l by DI-WET. Run samples with total lead greater than or equal to 1,000 mg/kg for TCLP only

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.
Storage Fees (applies when storage is requested):
■ Sample :\$2.00 / sample /mo (after 45 days)
■ Records: \$1 /ATL workorder /mo (after 1 year)

Circle or Add Analysis(es) Requested
SPECIFY APPROPRIATE MATRIX
SOIL WATER GROUND WATER WASTEWATER
TAT # Type
PRESERVATION
QA/QC
RTNE
CT
SWRCB Logcode
OTHER _____
REMARKS

ITEM	LAB USE ONLY:		Sample Description				Lead	SPECIFY APPROPRIATE MATRIX				TAT	Container(s)		PRESERVATION	REMARKS
	Lab No.	Sample ID / Location	Date	Time	SOIL	WATER		GROUND WATER	WASTEWATER	#	Type					
-1	1502453	B-14-0.0	7/15/15	0755	x						E	1	G J			
-2		B-14-1.0		0758	x						E	1	G J			
-3		B-15-0.0		0812	x						E	1	G J			
-4		B-15-1.0		0817	x						E	1	G J			
-5		B-16-0.0		0834	x						E	1	G J			
-6		B-16-1.0		0842	x						E	1	G J			
-7		B-17-0.0		0918	x						E	1	G J			
-8		B-17-1.0		0920	x						E	1	G J			
-9		B-18-0.0		0940	x						E	1	G J			
-10		B-18-1.0		0946	x						E	1	G J			
-11		B-18-2.5		0949	x						E	1	G J			
-12		B-18-3.5		0952	x						E	1	G J			
-13		B-19-0.0		0954	x						E	1	G J			
-14		B-19-1.0		0957	x						E	1	G J			
-15		B-20-0.0		1014	x						E	1	G J			
-16		B-20-1.0		1018	x						E	1	G J			
-17		B-21-0.0		1031	x						E	1	G J			
-18		B-21-1.0		1034	x						E	1	G J			
-19		B-22-0.0		1049	x						E	1	G J			
-20		B-22-1.0		1052	x						E	1	G J			

■ TAT starts 8AM the following day if samples received after 3 PM
TAT: A = Overnight ≤ 24 hrs B = Emergency Next Workday C = Critical 2 Workdays D = Urgent 3 Workdays E = Routine 7 Workdays
Preservatives: H=HCl N=HNO₃ S=H₂SO₄ C=4°C
Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal
Z=Zn(AC)₂ O=NaOH T=Na₂S₂O₃

CHAIN OF CUSTODY RECORD



**Advanced Technology
Laboratories**

3275 Walnut Avenue
Signal Hill, CA 90755
Tel: (562) 989-4045 • Fax: (562) 989-4040

FOR LABORATORY USE ONLY

P.O. #: _____
Logged By: _____ Date: _____

Method of Transport
Client
ATL
CA OverN
FedEx
Other: _____

Sample Condition Upon Receipt
1. CHILLED Y N 4. SEALED Y N
2. HEADSPACE (VOA) Y N 5. # OF SPLS MATCH COC Y N
3. CONTAINER INTACT Y N 6. PRESERVED Y N

Client: Geocon Address: 3303 North San Fernando Blvd Suite 100 Tel: 818-841-8388
Attention: Mike Conkle City: Burbank State: CA Zip Code: 91504 Fax: 818-841-1704

Project Name: State Route 405 AD Project #: S9890-06-10 Sampler: Mike Conkle (Signature)
Relinquished by: (Signature and Printed Name) Date: 7/15/15 Time: 1600 Received by: (Signature and Printed Name) Date: 7/15/15 Time: 1600
Relinquished by: (Signature and Printed Name) Date: 7/15/15 Time: 1726 Received by: (Signature and Printed Name) Date: 7/15/15 Time: 1726

I hereby authorize ATL to perform the work indicated below:
Project Mgr /Submitter: Mike Conkle Date: 7/15/15
Print Name: Mike Conkle Signature: *Mike Conkle*
Attn: Mike Conkle Co: Geocon Consultants Inc.
Addr: 3303 North San Fernando Blvd Suite 100 City: Burbank State: CA Zip: 91504

Bill To: Attn: Mike Conkle Co: Geocon Consultants Inc.
Addr: 3303 North San Fernando Blvd Suite 100 City: Burbank State: CA Zip: 91504

Special Instructions/Comments:
CT Contract 12A1535 Run samples with total lead greater than or equal to 50 mg/kg by WET. Run samples with WET results greater than or equal to 5.0 mg/l by DI-WET. Run samples with total lead greater than or equal to 1,000 mg/kg for TCLP only

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.
Storage Fees (applies when storage is requested):
■ Sample: \$2.00 / sample /mo (after 45 days)
■ Records: \$1 /ATL workorder /mo (after 1 year)

Circle or Add Analysis(es) Requested	SPECIFY APPROPRIATE MATRIX				TAT #	Type	CONTAINER PRESERVATION
	SOIL	WATER	GROUND WATER	WASTEWATER			
Lead					E 1	G J	QA/QC RTNE <input type="checkbox"/> CT <input type="checkbox"/> SWRCB <input type="checkbox"/> Logcode _____ OTHER _____ REMARKS _____

ITEM	LAB USE ONLY:		Sample Description	
	Lab No.	Sample ID / Location	Date	Time
	1502453-21	B-22-2-5	7/15/15	1705
	-22	B-22-3-5		1100
	-23	B-23-0-0		1202
	-24	B-23-1-0		1208
	-25	B-23-2-5		1212
	-26	B-23-3-5		1215
	-27	B-24-0-0		1219
	-28	B-24-1-0		1222
	-29	B-24-2-5		1227
	-30	B-24-3-5		1231
	-31	B-25-0-0		1242
	-32	B-25-1-0		1245
	-33	B-25-2-5		1249
	-34	B-26-0-0		1310
	-35	B-26-1-0		1318
	-36	B-26-2-5		1323
	-37	B-26-3-5		1331
	-38	B-27-0-0		1334
	-39	B-27-1-0		1338
	-40	B-27-2-5		1341

■ TAT starts 8AM the following day if samples received after 3 PM
 TAT: A = Overnight ≤ 24 hrs B = Emergency Next Workday C = Critical 2 Workdays D = Urgent 3 Workdays E = Routine 7 Workdays
 Preservatives: H=HCl N=HNO₃ S=H₂SO₄ C=4°C
 Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal
 Z=Zn(AC)₂ O=NaOH T=Na₂S₂O₃

CHAIN OF CUSTODY RECORD

 <p>Advanced Technology Laboratories</p> <p>3275 Walnut Avenue Signal Hill, CA 90755 Tel: (562) 989-4045 • Fax: (562) 989-4040</p>		FOR LABORATORY USE ONLY													
		P.O. #: _____ Logged By: _____ Date: _____		Method of Transport: Client <input checked="" type="checkbox"/> ATL <input type="checkbox"/> CA OverN <input type="checkbox"/> FedEx <input type="checkbox"/> Other: _____		Sample Condition Upon Receipt 1. CHILLED Y <input checked="" type="checkbox"/> N <input type="checkbox"/> 4. SEALED Y <input type="checkbox"/> N <input checked="" type="checkbox"/> 2. HEADSPACE (VOA) Y <input type="checkbox"/> N <input type="checkbox"/> 5. # OF SPLS MATCH COC Y <input type="checkbox"/> N <input type="checkbox"/> 3. CONTAINER INTACT Y <input checked="" type="checkbox"/> N <input type="checkbox"/> 6. PRESERVED Y <input type="checkbox"/> N <input checked="" type="checkbox"/>									
Client: Geocon Attention: Mike Conkle			Address: 3303 North San Fernando Blvd Suite 100 City: Burbank State: CA Zip Code: 91504			Tel: 818-841-8388 Fax: 818-841-1704									
Project Name: State Route 405 AD		Project #: S9890-06-10		Sampler: <i>Mike Heals</i>		Date: <i>7/15/15</i> Time: <i>1600</i>									
Relinquished by: <i>Mike Heals</i>		Date: <i>7/15/15</i> Time: <i>1600</i>		Received by: <i>Mike Heals</i>		Date: <i>7/15/15</i> Time: <i>1600</i>									
Relinquished by: <i>[Signature]</i>		Date: <i>7/15/15</i> Time: <i>1700</i>		Received by: <i>[Signature]</i>		Date: <i>7/15/15</i> Time: <i>1700</i>									
I hereby authorize ATL to perform the work indicated below: Project Mgr /Submitter: <i>Mike Conkle</i> Date: <i>7/15/15</i> Signature: <i>Mike Conkle</i>		Send Report To: Attn: Mike Conkle Co: Geocon Consultants Inc. Addr: 3303 North San Fernando Blvd Suite 100 City: Burbank State: CA Zip: 91504		Bill To: Attn: Mike Conkle Co: Geocon Consultants Inc. Addr: 3303 North San Fernando Blvd Suite 100 City: Burbank State: CA Zip: 91504		Special Instructions/Comments: CT Contract 12A1535 Run samples with total lead greater than or equal to 50 mg/kg by WET. Run samples with WET results greater than or equal to 5.0 mg/l by DI-WET. Run samples with total lead greater than or equal to 1,000 mg/kg for TCLP only									
Sample/Records - Archival & Disposal Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report. Storage Fees (applies when storage is requested): ■ Sample :\$2.00 / sample /mo (after 45 days) ■ Records: \$1 /ATL workorder /mo (after 1 year)		Circle or Add Analysis(es) Requested		SPECIFY APPROPRIATE MATRIX SOIL WATER GROUND WATER WASTEWATER		QA/QC RTNE <input type="checkbox"/> CT <input type="checkbox"/> SWRCB Logcode <input type="checkbox"/> OTHER _____ PRESERVATION REMARKS									
ITEM	LAB USE ONLY:	Sample Description													
	Lab No.	Sample ID / Location	Date	Time	Lead					TAT	#	Type			
	15-2457-41	B-27-23.5	7/15/15	1346	x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		
					x					E	1	G	J		



August 05, 2015

Mike Conkle
Geocon West, Inc.
3303 N. San Fernando Blvd., Suite 100
Burbank, CA 91504
Tel: (818) 841-8388
Fax:(818) 841-1704

ELAP No.: 1838
CSDLAC No.: 10196
ORELAP No.: CA300003
TCEQ No. : T104704502

Re: ATL Work Order Number : 1502480
Client Reference : State Route 405 ADL, S9890-06-10

Enclosed are the results for sample(s) received on July 16, 2015 by Advanced Technology Laboratories. The sample(s) are tested for the parameters as indicated on the enclosed chain of custody in accordance with applicable laboratory certifications. The laboratory results contained in this report specifically pertains to the sample(s) submitted.

Thank you for the opportunity to serve the needs of your company. If you have any questions, please feel free to contact me or your Project Manager.

Sincerely,

A handwritten signature in black ink, appearing to read 'E. Rodriguez', with a small 'E' and 'R' initial below the main signature.

Eddie Rodriguez
Laboratory Director

The cover letter and the case narrative are an integral part of this analytical report and its absence renders the report invalid. Test results contained within this data package meet the requirements of applicable state-specific certification programs. The report cannot be reproduced without written permission from the client and Advanced Technology Laboratories.



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/05/2015

SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B-29-0.0	1502480-01	Soil	7/16/15 7:38	7/16/15 16:13
B-29-1.0	1502480-02	Soil	7/16/15 7:44	7/16/15 16:13
B-30-0.0	1502480-03	Soil	7/16/15 8:02	7/16/15 16:13
B-30-1.0	1502480-04	Soil	7/16/15 8:05	7/16/15 16:13
B-30-2.5	1502480-05	Soil	7/16/15 8:08	7/16/15 16:13
B-30-3.5	1502480-06	Soil	7/16/15 8:10	7/16/15 16:13
B-31-0.0	1502480-07	Soil	7/16/15 8:14	7/16/15 16:13
B-31-1.0	1502480-08	Soil	7/16/15 8:20	7/16/15 16:13
B-31-2.5	1502480-09	Soil	7/16/15 8:22	7/16/15 16:13
B-31-3.5	1502480-10	Soil	7/16/15 8:24	7/16/15 16:13
B-32-0.0	1502480-11	Soil	7/16/15 8:32	7/16/15 16:13
B-32-1.0	1502480-12	Soil	7/16/15 8:38	7/16/15 16:13
B-32-2.5	1502480-13	Soil	7/16/15 8:47	7/16/15 16:13
B-32-3.5	1502480-14	Soil	7/16/15 8:53	7/16/15 16:13
B-33-0.0	1502480-15	Soil	7/16/15 9:01	7/16/15 16:13
B-33-1.0	1502480-16	Soil	7/16/15 9:11	7/16/15 16:13
B-33-2.5	1502480-17	Soil	7/16/15 9:16	7/16/15 16:13
B-33-3.5	1502480-18	Soil	7/16/15 9:19	7/16/15 16:13
B-35-0.0	1502480-19	Soil	7/16/15 9:32	7/16/15 16:13
B-35-1.0	1502480-20	Soil	7/16/15 9:40	7/16/15 16:13
B-35-2.5	1502480-21	Soil	7/16/15 9:44	7/16/15 16:13
B-35-3.5	1502480-22	Soil	7/16/15 9:46	7/16/15 16:13
B-36-0.0	1502480-23	Soil	7/16/15 10:02	7/16/15 16:13
B-36-1.0	1502480-24	Soil	7/16/15 10:06	7/16/15 16:13
B-36-2.5	1502480-25	Soil	7/16/15 10:09	7/16/15 16:13
B-36-3.5	1502480-26	Soil	7/16/15 10:13	7/16/15 16:13
B-37-0.0	1502480-27	Soil	7/16/15 10:33	7/16/15 16:13
B-37-1.0	1502480-28	Soil	7/16/15 10:36	7/16/15 16:13
B-37-2.5	1502480-29	Soil	7/16/15 10:39	7/16/15 16:13
B-37-3.5	1502480-30	Soil	7/16/15 10:44	7/16/15 16:13
B-38-0.0	1502480-31	Soil	7/16/15 10:50	7/16/15 16:13
B-38-1.0	1502480-32	Soil	7/16/15 10:54	7/16/15 16:13
B-38-2.5	1502480-33	Soil	7/16/15 10:57	7/16/15 16:13
B-38-3.5	1502480-34	Soil	7/16/15 11:02	7/16/15 16:13



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/05/2015

B-42-0.0	1502480-35	Soil	7/16/15 11:06	7/16/15 16:13
B-42-1.0	1502480-36	Soil	7/16/15 11:09	7/16/15 16:13
B-42-2.5	1502480-37	Soil	7/16/15 11:13	7/16/15 16:13
B-42-3.5	1502480-38	Soil	7/16/15 11:16	7/16/15 16:13

CASE NARRATIVE

Results were J-flagged. "J" is used to flag those results that are between the PQL (Practical Quantitation Limit) and the calculated MDL (Method Detection Limit). Results that are "J" flagged are estimated values since it becomes difficult to accurately quantitate the analyte near the MDL.



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/05/2015

Lead by ICP-AES EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time	
									Analized	Notes
1502480-01	B-29-0.0	41	mg/kg	1.0	0.16	1	B5G0336	07/17/2015	07/20/15 12:15	
1502480-02	B-29-1.0	20	mg/kg	1.0	0.16	1	B5G0336	07/17/2015	07/20/15 12:16	
1502480-03	B-30-0.0	9.4	mg/kg	1.0	0.16	1	B5G0336	07/17/2015	07/20/15 12:17	
1502480-04	B-30-1.0	4.5	mg/kg	1.0	0.16	1	B5G0336	07/17/2015	07/20/15 12:18	
1502480-05	B-30-2.5	2.0	mg/kg	1.0	0.16	1	B5G0336	07/17/2015	07/20/15 12:20	
1502480-06	B-30-3.5	2.9	mg/kg	1.0	0.16	1	B5G0336	07/17/2015	07/20/15 12:21	
1502480-07	B-31-0.0	18	mg/kg	1.0	0.16	1	B5G0336	07/17/2015	07/20/15 12:22	
1502480-08	B-31-1.0	1.5	mg/kg	1.0	0.16	1	B5G0336	07/17/2015	07/20/15 12:23	
1502480-09	B-31-2.5	1.4	mg/kg	1.0	0.16	1	B5G0336	07/17/2015	07/20/15 12:29	
1502480-10	B-31-3.5	1.4	mg/kg	1.0	0.16	1	B5G0336	07/17/2015	07/20/15 12:30	
1502480-11	B-32-0.0	3.2	mg/kg	1.0	0.16	1	B5G0336	07/17/2015	07/20/15 12:32	
1502480-12	B-32-1.0	3.2	mg/kg	1.0	0.16	1	B5G0336	07/17/2015	07/20/15 12:33	
1502480-13	B-32-2.5	3.0	mg/kg	1.0	0.16	1	B5G0336	07/17/2015	07/20/15 12:34	
1502480-14	B-32-3.5	2.2	mg/kg	1.0	0.16	1	B5G0336	07/17/2015	07/20/15 12:35	
1502480-15	B-33-0.0	60	mg/kg	1.0	0.16	1	B5G0336	07/17/2015	07/20/15 12:36	
1502480-16	B-33-1.0	4.1	mg/kg	1.0	0.16	1	B5G0336	07/17/2015	07/20/15 12:37	
1502480-17	B-33-2.5	3.3	mg/kg	1.0	0.16	1	B5G0336	07/17/2015	07/20/15 12:39	
1502480-18	B-33-3.5	1.8	mg/kg	1.0	0.16	1	B5G0336	07/17/2015	07/20/15 12:42	
1502480-19	B-35-0.0	23	mg/kg	0.99	0.16	1	B5G0337	07/17/2015	07/20/15 12:50	
1502480-20	B-35-1.0	5.4	mg/kg	1.0	0.16	1	B5G0337	07/17/2015	07/20/15 12:50	
1502480-21	B-35-2.5	3.6	mg/kg	1.0	0.16	1	B5G0337	07/17/2015	07/20/15 12:52	
1502480-22	B-35-3.5	2.5	mg/kg	1.0	0.16	1	B5G0337	07/17/2015	07/20/15 12:56	
1502480-23	B-36-0.0	8.8	mg/kg	1.0	0.16	1	B5G0337	07/17/2015	07/20/15 12:57	
1502480-24	B-36-1.0	4.7	mg/kg	1.0	0.16	1	B5G0337	07/17/2015	07/20/15 12:58	
1502480-25	B-36-2.5	6.4	mg/kg	1.0	0.16	1	B5G0337	07/17/2015	07/20/15 12:59	
1502480-26	B-36-3.5	6.0	mg/kg	0.99	0.16	1	B5G0337	07/17/2015	07/20/15 13:01	
1502480-27	B-37-0.0	31	mg/kg	1.0	0.16	1	B5G0337	07/17/2015	07/20/15 13:01	
1502480-28	B-37-1.0	4.9	mg/kg	1.0	0.16	1	B5G0337	07/17/2015	07/20/15 13:03	
1502480-29	B-37-2.5	3.0	mg/kg	1.0	0.16	1	B5G0337	07/17/2015	07/20/15 13:06	
1502480-30	B-37-3.5	1.6	mg/kg	1.0	0.16	1	B5G0337	07/17/2015	07/20/15 13:10	



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/05/2015

Lead by ICP-AES EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1502480-31	B-38-0.0	24	mg/kg	1.0	0.16	1	B5G0337	07/17/2015	07/20/15	13:10	
1502480-32	B-38-1.0	11	mg/kg	1.0	0.16	1	B5G0337	07/17/2015	07/20/15	13:12	
1502480-33	B-38-2.5	1.3	mg/kg	1.0	0.16	1	B5G0337	07/17/2015	07/20/15	13:13	
1502480-34	B-38-3.5	1.4	mg/kg	1.0	0.16	1	B5G0337	07/17/2015	07/20/15	13:25	
1502480-35	B-42-0.0	33	mg/kg	1.0	0.16	1	B5G0337	07/17/2015	07/20/15	13:15	
1502480-36	B-42-1.0	12	mg/kg	1.0	0.16	1	B5G0337	07/17/2015	07/20/15	13:16	
1502480-37	B-42-2.5	2.6	mg/kg	1.0	0.16	1	B5G0337	07/17/2015	07/20/15	13:17	
1502480-38	B-42-3.5	2.1	mg/kg	1.0	0.16	1	B5G0337	07/17/2015	07/20/15	13:19	

TCLP Metals by ICP-AES EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1502480-15	B-33-0.0	0.013	mg/L	0.050	0.0019	1	B5H0053	08/04/2015	08/04/15	13:24	J

STLC Metals by ICP-AES by EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1502480-15	B-33-0.0	7.9	mg/L	1.0	0.038	20	B5G0528	07/27/2015	07/27/15	10:44	

STLC DI Metals by ICP-AES by EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1502480-15	B-33-0.0	ND	mg/L	1.0	0.038	20	B5H0031	08/03/2015	08/03/15	15:09	



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/05/2015

pH by EPA 9045C

Analyte: pH

Analyst: LA

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
1502480-15	B-33-0.0	9.3	pH Units	0.10	0.10	1	B5H0068	08/04/2015	08/04/15 13:57	



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/05/2015

QUALITY CONTROL SECTION

Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5G0336 - EPA 3050 Modified_S									
Blank (B5G0336-BLK1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	ND	1.0					NR		
Blank (B5G0336-BLK2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	ND	1.0					NR		
LCS (B5G0336-BS1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	48.7571	1.0	50.0000		97.5	80 - 120			
Duplicate (B5G0336-DUP1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	2.33645	1.0		1.82244	NR		24.7	20	R
Duplicate (B5G0336-DUP2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	1.48335	1.0		1.54860	NR		4.30	20	
Matrix Spike (B5G0336-MS1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	224.132	1.0	250.000	1.82244	88.9	35 - 129			
Matrix Spike (B5G0336-MS2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	229.359	1.0	252.525	1.54860	90.2	35 - 129			
Matrix Spike Dup (B5G0336-MSD1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	216.504	1.0	250.000	1.82244	85.9	35 - 129	3.46	20	



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/05/2015

Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5G0337 - EPA 3050 Modified_S									
Blank (B5G0337-BLK1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	ND	1.0							NR
Blank (B5G0337-BLK2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	ND	1.0							NR
LCS (B5G0337-BS1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	48.3578	1.0	50.0000		96.7	80 - 120			
Duplicate (B5G0337-DUP1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	2.54327	1.0		2.13917			17.3	20	
Duplicate (B5G0337-DUP2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	4.72983	1.0		4.87492			3.02	20	
Matrix Spike (B5G0337-MS1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	230.534	1.0	250.000	2.13917	91.4	35 - 129			
Matrix Spike (B5G0337-MS2)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	213.038	1.0	250.000	4.87492	83.3	35 - 129			
Matrix Spike Dup (B5G0337-MSD1)					Prepared: 7/17/2015 Analyzed: 7/20/2015				
Lead	233.798	1.0	250.000	2.13917	92.7	35 - 129	1.41	20	



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/05/2015

TCLP Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
Batch B5H0053 - EPA 3010A_S								
Blank (B5H0053-BLK1)				Prepared: 8/4/2015 Analyzed: 8/4/2015				
Lead	ND	0.050			NR			
LCS (B5H0053-BS1)				Prepared: 8/4/2015 Analyzed: 8/4/2015				
Lead	0.972297	0.050	1.00000		97.2 80 - 120			
Duplicate (B5H0053-DUP1)				Prepared: 8/4/2015 Analyzed: 8/4/2015				
Lead	0.002573	0.050		0.008279	NR	105	20	R, J
Matrix Spike (B5H0053-MS1)				Prepared: 8/4/2015 Analyzed: 8/4/2015				
Lead	2.22988	0.050	2.50000	0.008279	88.9	77 - 121		
Matrix Spike Dup (B5H0053-MSD1)				Prepared: 8/4/2015 Analyzed: 8/4/2015				
Lead	2.22420	0.050	2.50000	0.008279	88.6	77 - 121	0.255	20



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/05/2015

STLC Metals by ICP-AES by EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5G0528 - STLC_S Extraction									
Blank (B5G0528-BLK1)					Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	ND	1.0			NR				
Blank (B5G0528-BLK2)					Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	ND	1.0			NR				
LCS (B5G0528-BS1)					Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	1.91248		2.00000		95.6	80 - 120			
Duplicate (B5G0528-DUP1)					Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	1.59406		1.0	1.22026	NR		26.6	20	R
Duplicate (B5G0528-DUP2)					Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	43.8853		1.0	66.5185	NR		41.0	20	R
Matrix Spike (B5G0528-MS1)					Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	3.35665		2.50000	1.22026	85.5	44 - 130			
Matrix Spike (B5G0528-MS2)					Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	66.2859		2.50000	66.5185	-9.31	44 - 130			M1
Matrix Spike Dup (B5G0528-MSD1)					Prepared: 7/27/2015 Analyzed: 7/27/2015				
Lead	3.45017		2.50000	1.22026	89.2	44 - 130	2.75	20	



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/05/2015

STLC DI Metals by ICP-AES by EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5H0031 - STLC DI_S Extraction									
Blank (B5H0031-BLK1)									
Lead	ND	1.0							
					Prepared: 8/3/2015 Analyzed: 8/3/2015				
LCS (B5H0031-BS1)									
Lead	2.06763		2.00000		103	80 - 120			
					Prepared: 8/3/2015 Analyzed: 8/3/2015				
Duplicate (B5H0031-DUP1)									
Lead	0.656493	1.0		0.408880	NR		46.5	20	R, J
					Prepared: 8/3/2015 Analyzed: 8/3/2015				
Matrix Spike (B5H0031-MS1)									
Lead	2.94387		2.50000	0.408880	101	70 - 130			
					Prepared: 8/3/2015 Analyzed: 8/3/2015				
Matrix Spike Dup (B5H0031-MSD1)									
Lead	2.92933		2.50000	0.408880	101	70 - 130	0.495	20	



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/05/2015

pH by EPA 9045C - Quality Control

Analyte	Result (pH Units)	PQL (pH Units)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
---------	----------------------	-------------------	----------------	------------------	-------	-----------------	-----	--------------	-------

Batch B5H0068 - Prep_WC1_S

Duplicate (B5H0068-DUP1)

Source: 1502480-15

Prepared: 8/4/2015 Analyzed: 8/4/2015

pH	10.0100	0.10		9.33000	NR		7.03	20	
----	---------	------	--	---------	----	--	------	----	--



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/05/2015

Notes and Definitions

R	RPD value outside acceptance criteria. Calculation is based on raw values.
M1	Matrix spike recovery outside of acceptance limit. The analytical batch was validated by the laboratory control sample.
J	Analyte detected below the Practical Quantitation Limit but above or equal to the Method Detection Limit. Result is an estimated concentration.
ND	Analyte is not detected at or above the Practical Quantitation Limit (PQL). When client requests quantitation against MDL, analyte is not detected at or above the Method Detection Limit (MDL)
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
NR	Not Reported
RPD	Relative Percent Difference
CA2	CA-ELAP (CDPH)
OR1	OR-NELAP (OSPHL)
TX1	TX-NELAP (TCEQ)

Notes:

- (1) The reported MDL and PQL are based on prep ratio variation and analytical dilution.
- (2) The suffix [2C] of specific analytes signifies that the reported result is taken from the instrument's second column.
- (3) Results are wet unless otherwise specified.

CHAIN OF CUSTODY RECORD

 <p>Advanced Technology Laboratories 3275 Walnut Avenue Signal Hill, CA 90755 Tel: (562) 989-4045 • Fax: (562) 989-4040</p>		FOR LABORATORY USE ONLY					
		P.O. #: _____ Logged By: _____ Date: _____		Method of Transport Client <input type="checkbox"/> ATL <input checked="" type="checkbox"/> CA OverN <input type="checkbox"/> FedEx <input type="checkbox"/> Other: _____		Sample Condition Upon Receipt 1. CHILLED Y <input checked="" type="checkbox"/> N <input type="checkbox"/> 4. SEALED Y <input type="checkbox"/> N <input checked="" type="checkbox"/> 2. HEADSPACE (VOA) Y <input type="checkbox"/> N <input type="checkbox"/> 5. # OF SPLS MATCH COC Y <input checked="" type="checkbox"/> N <input type="checkbox"/> 3. CONTAINER INTACT Y <input checked="" type="checkbox"/> N <input type="checkbox"/> 6. PRESERVED Y <input type="checkbox"/> N <input checked="" type="checkbox"/>	
Client: Geocon Attention: Mike Conkle			Address: 3303 North San Fernando Blvd Suite 100 City: Burbank State: CA Zip Code: 91504			Tel: 818-841-8388 Fax: 818-841-1704	
Project Name: State Route 405 AD Relinquished by: (Signature and Printed Name) <i>Mike Alcaro</i> Date: 7/16/15 Time: 1603 Relinquished by: (Signature and Printed Name) <i>MAP</i> Date: 7/16/15 Time: 1815 Relinquished by: (Signature and Printed Name) _____ Date: _____ Time: _____		Project #: S9890-06-10 Sampler: <i>Mike Alcaro</i> (Signature) Received by: (Signature and Printed Name) _____ Date: 7/16/15 Time: 1613 Received by: (Signature and Printed Name) _____ Date: 7/16/15 Time: 1815					
I hereby authorize ATL to perform the work indicated below: Project Mgr /Submitter: <i>Mike Conkle</i> Date: 7/16/15 Print Name: <i>Mike Conkle</i> Signature: _____		Send Report To: Attn: Mike Conkle Co: Geocon Consultants Inc. Addr: 3303 North San Fernando Blvd Suite 100 City: Burbank State: CA Zip: 91504		Bill To: Attn: Mike Conkle Co: Geocon Consultants Inc. Addr: 3303 North San Fernando Blvd Suite 100 City: Burbank State: CA Zip: 91504		Special Instructions/Comments: CT Contract 12A1535 Run samples with total lead greater than or equal to 50 mg/kg by WET. Run samples with WET results greater than or equal to 5.0 mg/l by DI-WET. Run samples with total lead greater than or equal to 1,000 mg/kg for TCLP only	
Sample/Records - Archival & Disposal Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report. Storage Fees (applies when storage is requested): ■ Sample :\$2.00 / sample /mo (after 45 days) ■ Records: \$1 /ATL workorder /mo (after 1 year)		Circle or Add Analysis(es) Requested		SPECIFY APPROPRIATE MATRIX		QA/QC RTNE <input type="checkbox"/> CT <input type="checkbox"/> SWRCB Logcode <input type="checkbox"/> OTHER _____	
LAB USE ONLY:		Sample Description		Container(s)		PRESERVATION	
ITEM	Lab No.	Sample ID / Location	Date	Time	TAT #	Type	REMARKS
	1502480 - 1	B - 29 - 0 - 0	7/16/15	0838	E 1	G J	
	- 2	B - 29 - 1 - 0		0744	E 1	G J	
	- 3	B - 30 - 0 - 0		0802	E 1	G J	
	- 4	B - 30 - 1 - 0		0808	E 1	G J	
	- 5	B - 30 - 2 - 5		0808	E 1	G J	
	- 6	B - 30 - 3 - 5		0810	E 1	G J	
	- 7	B - 31 - 0 - 0		0814	E 1	G J	
	- 8	B - 31 - 1 - 0		0820	E 1	G J	
	- 9	B - 31 - 2 - 5		0822	E 1	G J	
	- 10	B - 31 - 3 - 5		0824	E 1	G J	
	- 11	B - 32 - 0 - 0		0832	E 1	G J	
	- 12	B - 32 - 1 - 0		0838	E 1	G J	
	- 13	B - 32 - 2 - 5		0847	E 1	G J	
	- 14	B - 32 - 3 - 5		0853	E 1	G J	
	- 15	B - 33 - 0 - 0		0901	E 1	G J	
	- 16	B - 33 - 1 - 0		0901	E 1	G J	
	- 17	B - 33 - 2 - 5		0916	E 1	G J	
	- 18	B - 33 - 3 - 5		0919	E 1	G J	
	- 19	B - 35 - 0 - 0		0932	E 1	G J	
	- 20	B - 35 - 1 - 0		0940	E 1	G J	

Page 14 of 16

A = Overnight ≤ 24 hrs
 B = Emergency Next Workday
 C = Critical 2 Workdays
 D = Urgent 3 Workdays
 E = Routine 7 Workdays

Preservatives: H=HCl N=HNO₃ S=H₂SO₄ C=4°C
 Z=Zn(AC)₂ O=NaOH T=Na₂S₂O₃

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

CHAIN OF CUSTODY RECORD



**Advanced Technology
Laboratories**

3275 Walnut Avenue
Signal Hill, CA 90755
Tel: (562) 989-4045 • Fax: (562) 989-4040

FOR LABORATORY USE ONLY

P.O. #: _____

Logged By: _____ Date: _____

Method of Transport

Client

ATL

CA OverN

FedEx

Other: _____

Sample Condition Upon Receipt

1. CHILLED Y N 4. SEALED Y N

2. HEADSPACE (VOA) Y N 5. # OF SPLS MATCH COC Y N

3. CONTAINER INTACT Y N 6. PRESERVED Y N

Client: Geocon

Attention: Mike Conkle

Address: 3303 North San Fernando Blvd Suite 100

City: Burbank State: CA Zip Code: 91504

Project Name: State Route 405 AD

Relinquished by: (Signature and Printed Name) Mike Alcott Date: 7/16/15 Time: 1600

Relinquished by: (Signature and Printed Name) MAK Date: 7/16/15 Time: 1815

Relinquished by: (Signature and Printed Name) _____ Date: _____ Time: _____

Project #: S9890-06-10

Sampler: Mike Alcott

Received by: (Signature and Printed Name) MAK Date: 7/16/15 Time: 1703

Received by: (Signature and Printed Name) Proven Date: 7/16/15 Time: 1815

Received by: (Signature and Printed Name) _____ Date: _____ Time: _____

I hereby authorize ATL to perform the work indicated below:

Project Mgr /Submitter: Mike Conkle Date: 7/16/15

Print Name: Mike Conkle Signature: Mike Conkle

Send Report To:

Attn: Mike Conkle

Co: Geocon Consultants Inc.

Addr: 3303 North San Fernando Blvd Suite 100

City: Burbank State: CA Zip: 91504

Bill To:

Attn: Mike Conkle

Co: Geocon Consultants Inc.

Addr: 3303 North San Fernando Blvd Suite 100

City: Burbank State: CA Zip: 91504

Special Instructions/Comments:

CT Contract 12A1535 Run samples with total lead greater than or equal to 50 mg/kg by WET. Run samples with WET results greater than or equal to 5.0 mg/l by DI-WET. Run samples with total lead greater than or equal to 1,000 mg/kg for TCLP only

Sample/Records - Archival & Disposal

Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):

- Sample :\$2.00 / sample /mo (after 45 days)
- Records: \$1 /ATL workorder /mo (after 1 year)

Circle or Add Analysis(es) Requested

SPECIFY APPROPRIATE MATRIX	
SOIL	WATER
GROUND WATER	WASTEWATER

LAB USE ONLY:

ITEM	Sample Description			
	Lab No.	Sample ID / Location	Date	Time
	1502480-21	B-35-2-5	7/16/15	0944
	-22	B-35-3-5		0946
	-23	B-36-0-0		1002
	-24	B-36-1-0		1008
	-25	B-36-2-5		1009
	-26	B-36-3-5		1015
	-27	B-37-0-0		1033
	-28	B-37-1-0		1036
	-29	B-37-2-5		1039
	-30	B-37-3-5		1044
	-31	B-38-0-0		1050
	-32	B-38-1-0		1054
	-33	B-38-2-5		1057
	-34	B-38-3-5		1102
	-35	B-42-0-0		1106
	-36	B-42-1-0		1109
	-37	B-42-2-5		1113
	-38	B-42-3-5		1116

Container(s)

TAT	#	Type	REMARKS
E	1	G J	
E	1	G J	
E	1	G J	
E	1	G J	
E	1	G J	
E	1	G J	
E	1	G J	
E	1	G J	
E	1	G J	
E	1	G J	
E	1	G J	
E	1	G J	
E	1	G J	
E	1	G J	
E	1	G J	
E	1	G J	
E	1	G J	
E	1	G J	
E	1	G J	
E	1	G J	
E	1	G J	

Preservatives: H=HCl N=HNO₃ S=H₂SO₄ C=4°C
Z=Zn(AC)₂ O=NaOH T=Na₂S₂O₃

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Page 15 of 16

Diane Galvan

From: Mike Conkle [conkle@geoconinc.com]
Sent: Wednesday, July 29, 2015 2:31 PM
To: Diane Galvan
Subject: State Route 405 ADL

Diane,

For this project please also run TCLP soluble lead and pH on all results with WET soluble lead concentrations greater than or equal to 5.0 mg/l.



Michael P. Conkle, PG | *Senior Geologist*
Geocon

3303 N. San Fernando Blvd. Suite 100, Burbank, CA 91504

Tel 818.841.8388 Fax 818.841.1704 Cell 213.503.7841

Visit our NEW website at www.geoconinc.com

San Diego / Los Angeles / Irvine / Murrieta / Palm Desert / Sacramento / Livermore / Bakersfield



August 10, 2015

Mike Conkle
Geocon West, Inc.
3303 N. San Fernando Blvd., Suite 100
Burbank, CA 91504
Tel: (818) 841-8388
Fax:(818) 841-1704

ELAP No.: 1838
CSDLAC No.: 10196
ORELAP No.: CA300003
TCEQ No. : T104704502

Re: ATL Work Order Number : 1502493
Client Reference : State Route 405 ADL, S9890-06-10

Enclosed are the results for sample(s) received on July 17, 2015 by Advanced Technology Laboratories. The sample(s) are tested for the parameters as indicated on the enclosed chain of custody in accordance with applicable laboratory certifications. The laboratory results contained in this report specifically pertains to the sample(s) submitted.

Thank you for the opportunity to serve the needs of your company. If you have any questions, please feel free to contact me or your Project Manager.

Sincerely,

A handwritten signature in black ink, appearing to read 'Eddie Rodriguez', with a small 'Er' monogram below it.

Eddie Rodriguez
Laboratory Director

The cover letter and the case narrative are an integral part of this analytical report and its absence renders the report invalid. Test results contained within this data package meet the requirements of applicable state-specific certification programs. The report cannot be reproduced without written permission from the client and Advanced Technology Laboratories.



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/10/2015

SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B-51-0.0	1502493-01	Soil	7/17/15 14:08	7/17/15 16:10
B-51-1.0	1502493-02	Soil	7/17/15 14:11	7/17/15 16:10
B-51-2.5	1502493-03	Soil	7/17/15 14:14	7/17/15 16:10
B-51-3.5	1502493-04	Soil	7/17/15 14:15	7/17/15 16:10
B-52-0.0	1502493-05	Soil	7/17/15 13:52	7/17/15 16:10
B-52-1.0	1502493-06	Soil	7/17/15 13:55	7/17/15 16:10
B-52-2.5	1502493-07	Soil	7/17/15 14:01	7/17/15 16:10
B-52-3.5	1502493-08	Soil	7/17/15 14:05	7/17/15 16:10
B-53-0.0	1502493-09	Soil	7/17/15 13:33	7/17/15 16:10
B-53-1.0	1502493-10	Soil	7/17/15 13:37	7/17/15 16:10
B-53-2.5	1502493-11	Soil	7/17/15 13:41	7/17/15 16:10
B-53-3.5	1502493-12	Soil	7/17/15 13:47	7/17/15 16:10
B-56-0.0	1502493-13	Soil	7/17/15 13:11	7/17/15 16:10
B-56-1.0	1502493-14	Soil	7/17/15 13:16	7/17/15 16:10
B-56-2.5	1502493-15	Soil	7/17/15 13:19	7/17/15 16:10
B-56-3.5	1502493-16	Soil	7/17/15 13:21	7/17/15 16:10
B-57-0.0	1502493-17	Soil	7/17/15 12:50	7/17/15 16:10
B-57-1.0	1502493-18	Soil	7/17/15 12:54	7/17/15 16:10
B-57-2.5	1502493-19	Soil	7/17/15 12:57	7/17/15 16:10
B-57-3.5	1502493-20	Soil	7/17/15 13:01	7/17/15 16:10
B-59-0.0	1502493-21	Soil	7/17/15 12:32	7/17/15 16:10
B-59-1.0	1502493-22	Soil	7/17/15 12:35	7/17/15 16:10
B-59-2.5	1502493-23	Soil	7/17/15 12:38	7/17/15 16:10
B-59-3.5	1502493-24	Soil	7/17/15 12:41	7/17/15 16:10
B-60-0.0	1502493-25	Soil	7/17/15 12:16	7/17/15 16:10
B-60-1.0	1502493-26	Soil	7/17/15 12:20	7/17/15 16:10
B-60-2.5	1502493-27	Soil	7/17/15 12:24	7/17/15 16:10
B-60-3.5	1502493-28	Soil	7/17/15 12:28	7/17/15 16:10



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank , CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/10/2015

CASE NARRATIVE

Results were J-flagged. "J" is used to flag those results that are between the PQL (Practical Quantitation Limit) and the calculated MDL (Method Detection Limit). Results that are "J" flagged are estimated values since it becomes difficult to accurately quantitate the analyte near the MDL.



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank , CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/10/2015

Lead by ICP-AES EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1502493-01	B-51-0.0	97	mg/kg	1.0	0.16	1	B5G0476	07/24/2015	07/24/15 14:00		
1502493-02	B-51-1.0	4.0	mg/kg	1.0	0.16	1	B5G0476	07/24/2015	07/24/15 14:00		
1502493-03	B-51-2.5	3.1	mg/kg	1.0	0.16	1	B5G0476	07/24/2015	07/24/15 14:02		
1502493-04	B-51-3.5	4.5	mg/kg	1.0	0.16	1	B5G0476	07/24/2015	07/24/15 15:07		
1502493-05	B-52-0.0	61	mg/kg	1.0	0.16	1	B5G0476	07/24/2015	07/24/15 14:03		
1502493-06	B-52-1.0	4.9	mg/kg	1.0	0.16	1	B5G0476	07/24/2015	07/24/15 14:05		
1502493-07	B-52-2.5	2.4	mg/kg	1.0	0.16	1	B5G0476	07/24/2015	07/24/15 14:06		
1502493-08	B-52-3.5	3.0	mg/kg	0.99	0.16	1	B5G0476	07/24/2015	07/24/15 14:10		
1502493-09	B-53-0.0	130	mg/kg	1.0	0.16	1	B5G0476	07/24/2015	07/24/15 14:11		
1502493-10	B-53-1.0	2.8	mg/kg	1.0	0.16	1	B5G0476	07/24/2015	07/24/15 14:12		
1502493-11	B-53-2.5	4.6	mg/kg	1.0	0.16	1	B5G0476	07/24/2015	07/24/15 14:15		
1502493-12	B-53-3.5	3.8	mg/kg	1.0	0.16	1	B5G0476	07/24/2015	07/24/15 14:17		
1502493-13	B-56-0.0	210	mg/kg	1.0	0.16	1	B5G0476	07/24/2015	07/24/15 14:17		
1502493-14	B-56-1.0	4.4	mg/kg	1.0	0.16	1	B5G0476	07/24/2015	07/24/15 14:19		
1502493-15	B-56-2.5	2.0	mg/kg	1.0	0.16	1	B5G0476	07/24/2015	07/24/15 14:19		
1502493-16	B-56-3.5	2.3	mg/kg	1.0	0.16	1	B5G0476	07/24/2015	07/24/15 14:23		
1502493-17	B-57-0.0	310	mg/kg	1.0	0.16	1	B5G0476	07/24/2015	07/24/15 14:23		
1502493-18	B-57-1.0	3.2	mg/kg	1.0	0.16	1	B5G0476	07/24/2015	07/24/15 14:25		
1502493-19	B-57-2.5	3.6	mg/kg	1.0	0.16	1	B5G0476	07/24/2015	07/24/15 14:26		
1502493-20	B-57-3.5	3.9	mg/kg	1.0	0.16	1	B5G0476	07/24/2015	07/24/15 14:27		
1502493-21	B-59-0.0	200	mg/kg	1.0	0.16	1	B5G0477	07/24/2015	07/24/15 14:37		
1502493-22	B-59-1.0	24	mg/kg	1.0	0.16	1	B5G0477	07/24/2015	07/24/15 14:37		
1502493-23	B-59-2.5	2.6	mg/kg	1.0	0.16	1	B5G0477	07/24/2015	07/24/15 14:38		
1502493-24	B-59-3.5	0.66	mg/kg	1.0	0.16	1	B5G0477	07/24/2015	07/24/15 14:39		J
1502493-25	B-60-0.0	24	mg/kg	1.0	0.16	1	B5G0477	07/24/2015	07/24/15 14:40		
1502493-26	B-60-1.0	14	mg/kg	1.0	0.16	1	B5G0477	07/24/2015	07/24/15 14:41		
1502493-27	B-60-2.5	8.5	mg/kg	1.0	0.16	1	B5G0477	07/24/2015	07/24/15 14:42		
1502493-28	B-60-3.5	12	mg/kg	1.0	0.16	1	B5G0477	07/24/2015	07/24/15 14:43		



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank , CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/10/2015

TCLP Metals by ICP-AES EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									AnalYZed		
1502493-01	B-51-0.0	0.034	mg/L	0.050	0.0019	1	B5H0130	08/06/2015	08/06/15 15:27		J
1502493-13	B-56-0.0	0.088	mg/L	0.050	0.0019	1	B5H0130	08/06/2015	08/06/15 15:29		
1502493-17	B-57-0.0	0.19	mg/L	0.050	0.0019	1	B5H0130	08/06/2015	08/06/15 15:32		
1502493-21	B-59-0.0	0.087	mg/L	0.050	0.0019	1	B5H0130	08/06/2015	08/06/15 15:35		

STLC Metals by ICP-AES by EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									AnalYZed		
1502493-01	B-51-0.0	6.2	mg/L	1.0	0.038	20	B5G0671	07/31/2015	07/31/15 11:02		
1502493-05	B-52-0.0	2.3	mg/L	1.0	0.038	20	B5G0671	07/31/2015	07/31/15 11:04		
1502493-09	B-53-0.0	4.0	mg/L	1.0	0.038	20	B5G0671	07/31/2015	07/31/15 11:06		
1502493-13	B-56-0.0	9.2	mg/L	1.0	0.038	20	B5G0671	07/31/2015	07/31/15 11:09		
1502493-17	B-57-0.0	16	mg/L	1.0	0.038	20	B5G0671	07/31/2015	07/31/15 11:15		
1502493-21	B-59-0.0	8.6	mg/L	1.0	0.038	20	B5G0671	07/31/2015	07/31/15 11:17		

STLC DI Metals by ICP-AES by EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									AnalYZed		
1502493-01	B-51-0.0	ND	mg/L	1.0	0.038	20	B5H0103	08/05/2015	08/05/15 12:20		
1502493-13	B-56-0.0	ND	mg/L	1.0	0.038	20	B5H0103	08/05/2015	08/05/15 12:36		
1502493-17	B-57-0.0	ND	mg/L	1.0	0.038	20	B5H0103	08/05/2015	08/05/15 12:39		
1502493-21	B-59-0.0	ND	mg/L	1.0	0.038	20	B5H0103	08/05/2015	08/05/15 12:43		



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/10/2015

pH by EPA 9045C

Analyte: pH

Analyst: LA

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time	
									Analyzed	Notes
1502493-01	B-51-0.0	7.9	pH Units	0.10	0.10	1	B5H0017	07/31/2015	07/31/15 15:08	
1502493-13	B-56-0.0	7.8	pH Units	0.10	0.10	1	B5H0017	07/31/2015	07/31/15 15:08	
1502493-17	B-57-0.0	8.0	pH Units	0.10	0.10	1	B5H0017	07/31/2015	07/31/15 15:08	
1502493-21	B-59-0.0	8.1	pH Units	0.10	0.10	1	B5H0017	07/31/2015	07/31/15 15:08	



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/10/2015

QUALITY CONTROL SECTION

Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5G0476 - EPA 3050 Modified_S									
Blank (B5G0476-BLK1)									
Lead	0.731088	1.0							J
Blank (B5G0476-BLK2)									
Lead	0.182489	1.0							J
LCS (B5G0476-BS1)									
Lead	51.9750	1.0	50.0000		104	80 - 120			
Duplicate (B5G0476-DUP1)									
				Source: 1502493-20					
Lead	4.64135	1.0		3.91486	NR		17.0	20	
Duplicate (B5G0476-DUP2)									
				Source: 1502493-10					
Lead	4.79138	1.0		2.84001	NR		51.1	20	R
Matrix Spike (B5G0476-MS1)									
				Source: 1502493-20					
Lead	212.910	1.0	250.000	3.91486	83.6	35 - 129			
Matrix Spike (B5G0476-MS2)									
				Source: 1502493-10					
Lead	222.975	1.0	250.000	2.84001	88.1	35 - 129			
Matrix Spike Dup (B5G0476-MSD1)									
				Source: 1502493-20					
Lead	214.738	1.0	250.000	3.91486	84.3	35 - 129	0.855	20	



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/10/2015

Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5G0477 - EPA 3050 Modified_S									
Blank (B5G0477-BLK1)									
Lead	ND	1.0							Prepared: 7/24/2015 Analyzed: 7/24/2015 NR
Blank (B5G0477-BLK2)									
Lead	ND	1.0							Prepared: 7/24/2015 Analyzed: 7/24/2015 NR
LCS (B5G0477-BS1)									
Lead	48.7611	1.0	50.0000		97.5	80 - 120			Prepared: 7/24/2015 Analyzed: 7/24/2015
Duplicate (B5G0477-DUP1)									
Lead	1.94926	1.0		2.22526			13.2	20	Source: 1502507-12 Prepared: 7/24/2015 Analyzed: 7/24/2015 NR
Duplicate (B5G0477-DUP2)									
Lead	4.87970	1.0		4.17505			15.6	20	Source: 1502507-02 Prepared: 7/24/2015 Analyzed: 7/24/2015 NR
Matrix Spike (B5G0477-MS1)									
Lead	236.297	1.0	250.000	2.22526	93.6	35 - 129			Source: 1502507-12 Prepared: 7/24/2015 Analyzed: 7/24/2015
Matrix Spike (B5G0477-MS2)									
Lead	226.230	1.0	250.000	4.17505	88.8	35 - 129			Source: 1502507-02 Prepared: 7/24/2015 Analyzed: 7/24/2015
Matrix Spike Dup (B5G0477-MSD1)									
Lead	228.095	0.99	247.525	2.22526	91.3	35 - 129	3.53	20	Source: 1502507-12 Prepared: 7/24/2015 Analyzed: 7/24/2015



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/10/2015

TCLP Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
Batch B5H0130 - EPA 3010A_S								
Blank (B5H0130-BLK1)								
						Prepared: 8/6/2015 Analyzed: 8/6/2015		
Lead	0.002248	0.050			NR			J
Blank (B5H0130-BLK2)								
						Prepared: 8/6/2015 Analyzed: 8/6/2015		
Lead	ND	0.050			NR			
LCS (B5H0130-BS1)								
						Prepared: 8/6/2015 Analyzed: 8/6/2015		
Lead	0.889221	0.050	1.00000		88.9 80 - 120			
Duplicate (B5H0130-DUP1)								
						Prepared: 8/6/2015 Analyzed: 8/6/2015		
Lead	2.30505	0.050		2.26813	NR		1.61	20
Duplicate (B5H0130-DUP2)								
						Prepared: 8/6/2015 Analyzed: 8/6/2015		
Lead	0.082803	0.050		0.086509	NR		4.38	20
Matrix Spike (B5H0130-MS1)								
						Prepared: 8/6/2015 Analyzed: 8/6/2015		
Lead	4.62746	0.050	2.50000	2.26813	94.4 77 - 121			
Matrix Spike Dup (B5H0130-MSD1)								
						Prepared: 8/6/2015 Analyzed: 8/6/2015		
Lead	4.46367	0.050	2.50000	2.26813	87.8 77 - 121	3.60	20	



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/10/2015

STLC Metals by ICP-AES by EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
Batch B5G0671 - STLC_S Extraction								
Blank (B5G0671-BLK1)				Prepared: 7/31/2015 Analyzed: 7/31/2015				
Lead	ND	1.0			NR			
LCS (B5G0671-BS1)				Prepared: 7/31/2015 Analyzed: 7/31/2015				
Lead	1.92727		2.00000		96.4 80 - 120			
Duplicate (B5G0671-DUP1)				Source: 1501839-05 Prepared: 7/31/2015 Analyzed: 7/31/2015				
Lead	150.135	1.0		88.7321	NR	51.4	20	R
Matrix Spike (B5G0671-MS1)				Source: 1501839-05 Prepared: 7/31/2015 Analyzed: 7/31/2015				
Lead	86.4226		2.50000	88.7321	-92.4 44 - 130			M1
Matrix Spike Dup (B5G0671-MSD1)				Source: 1501839-05 Prepared: 7/31/2015 Analyzed: 7/31/2015				
Lead	86.4157		2.50000	88.7321	-92.7 44 - 130	0.00794	20	M1



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/10/2015

STLC DI Metals by ICP-AES by EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
Batch B5H0103 - STLC DI_S Extraction								
Blank (B5H0103-BLK1)				Prepared: 8/5/2015 Analyzed: 8/5/2015				
Lead	ND	1.0			NR			
LCS (B5H0103-BS1)				Prepared: 8/5/2015 Analyzed: 8/5/2015				
Lead	2.14071		2.00000		107 80 - 120			
Duplicate (B5H0103-DUP1)				Source: 1502493-01 Prepared: 8/5/2015 Analyzed: 8/5/2015				
Lead	ND	1.0		ND	NR		20	
Matrix Spike (B5H0103-MS1)				Source: 1502493-01 Prepared: 8/5/2015 Analyzed: 8/5/2015				
Lead	2.51421		2.50000	-0.025198	101 70 - 130			
Matrix Spike Dup (B5H0103-MSD1)				Source: 1502493-01 Prepared: 8/5/2015 Analyzed: 8/5/2015				
Lead	2.52959		2.50000	-0.025198	101 70 - 130	0.610	20	



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/10/2015

pH by EPA 9045C - Quality Control

Analyte	Result (pH Units)	PQL (pH Units)	Spike Level	Source Result	% Rec % Rec	% Rec Limits	RPD	RPD Limit	Notes
---------	----------------------	-------------------	----------------	------------------	----------------	-----------------	-----	--------------	-------

Batch B5H0017 - Prep_WC1_S

Duplicate (B5H0017-DUP1)

Source: 1502493-01

Prepared: 7/31/2015 Analyzed: 7/31/2015

pH	8.03000	0.10		7.92000	NR		1.38	20	
----	---------	------	--	---------	----	--	------	----	--



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/10/2015

Notes and Definitions

R	RPD value outside acceptance criteria. Calculation is based on raw values.
M1	Matrix spike recovery outside of acceptance limit. The analytical batch was validated by the laboratory control sample.
J	Analyte detected below the Practical Quantitation Limit but above or equal to the Method Detection Limit. Result is an estimated concentration.
ND	Analyte is not detected at or above the Practical Quantitation Limit (PQL). When client requests quantitation against MDL, analyte is not detected at or above the Method Detection Limit (MDL)
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
NR	Not Reported
RPD	Relative Percent Difference
CA2	CA-ELAP (CDPH)
OR1	OR-NELAP (OSPHL)
TX1	TX-NELAP (TCEQ)

- Notes:
- (1) The reported MDL and PQL are based on prep ratio variation and analytical dilution.
 - (2) The suffix [2C] of specific analytes signifies that the reported result is taken from the instrument's second column.
 - (3) Results are wet unless otherwise specified.

Diane Galvan

From: Mike Conkle [conkle@geoconinc.com]
Sent: Wednesday, July 29, 2015 2:31 PM
To: Diane Galvan
Subject: State Route 405 ADL

Diane,

For this project please also run TCLP soluble lead and pH on all results with WET soluble lead concentrations greater than or equal to 5.0 mg/l.



Michael P. Conkle, PG | *Senior Geologist*
Geocon

3303 N. San Fernando Blvd. Suite 100, Burbank, CA 91504

Tel 818.841.8388 Fax 818.841.1704 Cell 213.503.7841

Visit our NEW website at www.geoconinc.com

San Diego / Los Angeles / Irvine / Murrieta / Palm Desert / Sacramento / Livermore / Bakersfield



August 11, 2015

Mike Conkle
Geocon West, Inc.
3303 N. San Fernando Blvd., Suite 100
Burbank, CA 91504
Tel: (818) 841-8388
Fax:(818) 841-1704

ELAP No.: 1838
CSDLAC No.: 10196
ORELAP No.: CA300003
TCEQ No. : T104704502

Re: ATL Work Order Number : 1502507
Client Reference : State Route 405 ADL, S9890-06-10

Enclosed are the results for sample(s) received on July 20, 2015 by Advanced Technology Laboratories. The sample(s) are tested for the parameters as indicated on the enclosed chain of custody in accordance with applicable laboratory certifications. The laboratory results contained in this report specifically pertains to the sample(s) submitted.

Thank you for the opportunity to serve the needs of your company. If you have any questions, please feel free to contact me or your Project Manager.

Sincerely,

A handwritten signature in black ink, appearing to read 'E. Rodriguez', written in a cursive style.

Eddie Rodriguez
Laboratory Director

The cover letter and the case narrative are an integral part of this analytical report and its absence renders the report invalid. Test results contained within this data package meet the requirements of applicable state-specific certification programs. The report cannot be reproduced without written permission from the client and Advanced Technology Laboratories.



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/11/2015

SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B-39-0.0	1502507-01	Soil	7/20/15 12:08	7/20/15 16:12
B-39-1.0	1502507-02	Soil	7/20/15 12:11	7/20/15 16:12
B-39-2.5	1502507-03	Soil	7/20/15 12:14	7/20/15 16:12
B-39-3.5	1502507-04	Soil	7/20/15 12:16	7/20/15 16:12
B-40-0.0	1502507-05	Soil	7/20/15 11:53	7/20/15 16:12
B-40-1.0	1502507-06	Soil	7/20/15 11:55	7/20/15 16:12
B-40-2.5	1502507-07	Soil	7/20/15 12:01	7/20/15 16:12
B-40-3.5	1502507-08	Soil	7/20/15 12:03	7/20/15 16:12
B-41-0.0	1502507-09	Soil	7/20/15 11:33	7/20/15 16:12
B-41-1.0	1502507-10	Soil	7/20/15 11:35	7/20/15 16:12
B-41-2.5	1502507-11	Soil	7/20/15 11:47	7/20/15 16:12
B-41-3.5	1502507-12	Soil	7/20/15 11:49	7/20/15 16:12
B-43-0.0	1502507-13	Soil	7/20/15 11:06	7/20/15 16:12
B-43-1.0	1502507-14	Soil	7/20/15 11:12	7/20/15 16:12
B-43-2.5	1502507-15	Soil	7/20/15 11:14	7/20/15 16:12
B-43-3.5	1502507-16	Soil	7/20/15 11:16	7/20/15 16:12
B-44-0.0	1502507-17	Soil	7/20/15 10:44	7/20/15 16:12
B-44-1.0	1502507-18	Soil	7/20/15 10:47	7/20/15 16:12
B-44-2.5	1502507-19	Soil	7/20/15 10:50	7/20/15 16:12
B-44-3.5	1502507-20	Soil	7/20/15 10:53	7/20/15 16:12
B-45-0.0	1502507-21	Soil	7/20/15 10:24	7/20/15 16:12
B-45-1.0	1502507-22	Soil	7/20/15 10:29	7/20/15 16:12
B-45-2.5	1502507-23	Soil	7/20/15 10:36	7/20/15 16:12
B-45-3.5	1502507-24	Soil	7/20/15 10:39	7/20/15 16:12
B-46-0.0	1502507-25	Soil	7/20/15 10:14	7/20/15 16:12
B-46-1.0	1502507-26	Soil	7/20/15 10:17	7/20/15 16:12
B-46-2.5	1502507-27	Soil	7/20/15 10:18	7/20/15 16:12
B-46-3.5	1502507-28	Soil	7/20/15 10:19	7/20/15 16:12
B-47-0.0	1502507-29	Soil	7/20/15 10:01	7/20/15 16:12
B-47-1.0	1502507-30	Soil	7/20/15 10:05	7/20/15 16:12
B-47-2.5	1502507-31	Soil	7/20/15 10:09	7/20/15 16:12
B-47-3.5	1502507-32	Soil	7/20/15 10:10	7/20/15 16:12
B-48-0.0	1502507-33	Soil	7/20/15 9:43	7/20/15 16:12
B-48-1.0	1502507-34	Soil	7/20/15 9:47	7/20/15 16:12



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/11/2015

B-48-2.5	1502507-35	Soil	7/20/15 9:49	7/20/15 16:12
B-48-3.5	1502507-36	Soil	7/20/15 9:51	7/20/15 16:12
B-49-0.0	1502507-37	Soil	7/20/15 8:45	7/20/15 16:12
B-49-1.0	1502507-38	Soil	7/20/15 8:46	7/20/15 16:12
B-49-2.5	1502507-39	Soil	7/20/15 8:51	7/20/15 16:12
B-49-3.5	1502507-40	Soil	7/20/15 8:52	7/20/15 16:12
B-50-0.0	1502507-41	Soil	7/20/15 8:26	7/20/15 16:12
B-50-1.0	1502507-42	Soil	7/20/15 8:28	7/20/15 16:12
B-50-2.5	1502507-43	Soil	7/20/15 8:32	7/20/15 16:12
B-50-3.5	1502507-44	Soil	7/20/15 8:34	7/20/15 16:12
B-54-0.0	1502507-45	Soil	7/20/15 9:21	7/20/15 16:12
B-54-1.0	1502507-46	Soil	7/20/15 9:25	7/20/15 16:12
B-54-2.5	1502507-47	Soil	7/20/15 9:27	7/20/15 16:12
B-54-3.5	1502507-48	Soil	7/20/15 9:29	7/20/15 16:12
B-55-0.0	1502507-49	Soil	7/20/15 9:03	7/20/15 16:12
B-55-1.0	1502507-50	Soil	7/20/15 9:05	7/20/15 16:12
B-55-2.5	1502507-51	Soil	7/20/15 9:07	7/20/15 16:12
B-55-3.5	1502507-52	Soil	7/20/15 9:10	7/20/15 16:12

CASE NARRATIVE

Results were J-flagged. "J" is used to flag those results that are between the PQL (Practical Quantitation Limit) and the calculated MDL (Method Detection Limit). Results that are "J" flagged are estimated values since it becomes difficult to accurately quantitate the analyte near the MDL.



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/11/2015

Lead by ICP-AES EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1502507-01	B-39-0.0	84	mg/kg	1.0	0.16	1	B5G0477	07/24/2015	07/24/15 14:44		
1502507-02	B-39-1.0	4.2	mg/kg	1.0	0.16	1	B5G0477	07/24/2015	07/24/15 14:47		
1502507-03	B-39-2.5	4.9	mg/kg	1.0	0.16	1	B5G0477	07/24/2015	07/24/15 14:51		
1502507-04	B-39-3.5	4.4	mg/kg	1.0	0.16	1	B5G0477	07/24/2015	07/24/15 14:52		
1502507-05	B-40-0.0	100	mg/kg	1.0	0.16	1	B5G0477	07/24/2015	07/24/15 14:53		
1502507-06	B-40-1.0	3.8	mg/kg	0.99	0.16	1	B5G0477	07/24/2015	07/24/15 14:54		
1502507-07	B-40-2.5	3.1	mg/kg	1.0	0.16	1	B5G0477	07/24/2015	07/24/15 14:55		
1502507-08	B-40-3.5	2.7	mg/kg	1.0	0.16	1	B5G0477	07/24/2015	07/24/15 14:56		
1502507-09	B-41-0.0	83	mg/kg	1.0	0.16	1	B5G0477	07/24/2015	07/24/15 14:57		
1502507-10	B-41-1.0	7.1	mg/kg	1.0	0.16	1	B5G0477	07/24/2015	07/24/15 15:01		
1502507-11	B-41-2.5	2.5	mg/kg	1.0	0.16	1	B5G0477	07/24/2015	07/24/15 15:02		
1502507-12	B-41-3.5	2.2	mg/kg	1.0	0.16	1	B5G0477	07/24/2015	07/24/15 15:03		
1502507-13	B-43-0.0	210	mg/kg	0.99	0.16	1	B5G0478	07/24/2015	07/24/15 15:13		
1502507-14	B-43-1.0	4.5	mg/kg	1.0	0.16	1	B5G0478	07/24/2015	07/24/15 15:15		
1502507-15	B-43-2.5	2.1	mg/kg	1.0	0.16	1	B5G0478	07/24/2015	07/24/15 15:16		
1502507-16	B-43-3.5	5.3	mg/kg	1.0	0.16	1	B5G0478	07/24/2015	07/24/15 15:17		
1502507-17	B-44-0.0	29	mg/kg	1.0	0.16	1	B5G0478	07/24/2015	07/24/15 15:18		
1502507-18	B-44-1.0	3.7	mg/kg	1.0	0.16	1	B5G0478	07/24/2015	07/24/15 15:19		
1502507-19	B-44-2.5	4.1	mg/kg	1.0	0.16	1	B5G0478	07/24/2015	07/24/15 15:20		
1502507-20	B-44-3.5	3.2	mg/kg	1.0	0.16	1	B5G0478	07/24/2015	07/24/15 15:22		
1502507-21	B-45-0.0	82	mg/kg	1.0	0.16	1	B5G0478	07/24/2015	07/24/15 15:22		
1502507-22	B-45-1.0	4.8	mg/kg	1.0	0.16	1	B5G0478	07/24/2015	07/24/15 15:24		
1502507-23	B-45-2.5	2.5	mg/kg	1.0	0.16	1	B5G0478	07/24/2015	07/24/15 15:30		
1502507-24	B-45-3.5	2.0	mg/kg	1.0	0.16	1	B5G0478	07/24/2015	07/24/15 15:30		
1502507-25	B-46-0.0	8.8	mg/kg	1.0	0.16	1	B5G0478	07/24/2015	07/24/15 15:32		
1502507-26	B-46-1.0	1.5	mg/kg	1.0	0.16	1	B5G0478	07/24/2015	07/24/15 15:33		
1502507-27	B-46-2.5	0.86	mg/kg	1.0	0.16	1	B5G0478	07/24/2015	07/24/15 15:34		J
1502507-28	B-46-3.5	1.8	mg/kg	1.0	0.16	1	B5G0478	07/24/2015	07/24/15 15:47		
1502507-29	B-47-0.0	16	mg/kg	1.0	0.16	1	B5G0478	07/24/2015	07/24/15 15:37		
1502507-30	B-47-1.0	1.3	mg/kg	1.0	0.16	1	B5G0478	07/24/2015	07/24/15 15:38		



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/11/2015

Lead by ICP-AES EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1502507-31	B-47-2.5	2.5	mg/kg	1.0	0.16	1	B5G0478	07/24/2015	07/24/15 15:42		
1502507-32	B-47-3.5	2.0	mg/kg	1.0	0.16	1	B5G0478	07/24/2015	07/24/15 15:43		
1502507-33	B-48-0.0	5.6	mg/kg	1.0	0.16	1	B5G0479	07/24/2015	07/27/15 08:24		
1502507-34	B-48-1.0	0.72	mg/kg	1.0	0.16	1	B5G0479	07/24/2015	07/27/15 08:25		J
1502507-35	B-48-2.5	4.0	mg/kg	1.0	0.16	1	B5G0479	07/24/2015	07/27/15 08:26		
1502507-36	B-48-3.5	3.4	mg/kg	1.0	0.16	1	B5G0479	07/24/2015	07/27/15 08:28		
1502507-37	B-49-0.0	190	mg/kg	1.0	0.16	1	B5G0479	07/24/2015	07/27/15 08:28		
1502507-38	B-49-1.0	1.4	mg/kg	1.0	0.16	1	B5G0479	07/24/2015	07/27/15 08:30		
1502507-39	B-49-2.5	0.90	mg/kg	1.0	0.16	1	B5G0479	07/24/2015	07/27/15 08:31		J
1502507-40	B-49-3.5	0.27	mg/kg	1.0	0.16	1	B5G0479	07/24/2015	07/27/15 08:35		J
1502507-41	B-50-0.0	48	mg/kg	1.0	0.16	1	B5G0479	07/24/2015	07/27/15 08:35		
1502507-42	B-50-1.0	3.6	mg/kg	1.0	0.16	1	B5G0479	07/24/2015	07/27/15 08:37		
1502507-43	B-50-2.5	3.0	mg/kg	0.99	0.16	1	B5G0479	07/24/2015	07/27/15 08:40		
1502507-44	B-50-3.5	5.7	mg/kg	1.0	0.16	1	B5G0479	07/24/2015	07/27/15 08:41		
1502507-45	B-54-0.0	80	mg/kg	1.0	0.16	1	B5G0479	07/24/2015	07/27/15 08:42		
1502507-46	B-54-1.0	8.2	mg/kg	1.0	0.16	1	B5G0479	07/24/2015	07/27/15 08:43		
1502507-47	B-54-2.5	1.6	mg/kg	1.0	0.16	1	B5G0479	07/24/2015	07/27/15 08:44		
1502507-48	B-54-3.5	4.2	mg/kg	1.0	0.16	1	B5G0479	07/24/2015	07/27/15 08:48		
1502507-49	B-55-0.0	23	mg/kg	1.0	0.16	1	B5G0479	07/24/2015	07/27/15 08:50		
1502507-50	B-55-1.0	3.3	mg/kg	1.0	0.16	1	B5G0479	07/24/2015	07/27/15 08:51		
1502507-51	B-55-2.5	4.1	mg/kg	1.0	0.16	1	B5G0479	07/24/2015	07/27/15 08:52		
1502507-52	B-55-3.5	2.9	mg/kg	1.0	0.16	1	B5G0479	07/24/2015	07/27/15 08:53		



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/11/2015

TCLP Metals by ICP-AES EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1502507-05	B-40-0.0	0.066	mg/L	0.050	0.0019	1	B5H0215	08/10/2015	08/10/15	12:46	
1502507-13	B-43-0.0	0.30	mg/L	0.050	0.0019	1	B5H0215	08/10/2015	08/10/15	12:56	
1502507-21	B-45-0.0	0.067	mg/L	0.050	0.0019	1	B5H0215	08/10/2015	08/10/15	12:59	
1502507-37	B-49-0.0	0.68	mg/L	0.050	0.0019	1	B5H0215	08/10/2015	08/10/15	13:01	
1502507-45	B-54-0.0	0.23	mg/L	0.050	0.0019	1	B5H0215	08/10/2015	08/10/15	13:04	

STLC Metals by ICP-AES by EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1502507-01	B-39-0.0	4.7	mg/L	1.0	0.038	20	B5H0030	08/03/2015	08/03/15	13:58	
1502507-05	B-40-0.0	12	mg/L	1.0	0.038	20	B5H0030	08/03/2015	08/03/15	14:00	
1502507-09	B-41-0.0	4.5	mg/L	1.0	0.038	20	B5H0030	08/03/2015	08/03/15	14:02	
1502507-13	B-43-0.0	13	mg/L	1.0	0.038	20	B5H0030	08/03/2015	08/03/15	14:05	
1502507-21	B-45-0.0	6.4	mg/L	1.0	0.038	20	B5H0030	08/03/2015	08/03/15	14:07	
1502507-37	B-49-0.0	8.1	mg/L	1.0	0.038	20	B5H0030	08/03/2015	08/03/15	14:13	
1502507-45	B-54-0.0	5.0	mg/L	1.0	0.038	20	B5H0030	08/03/2015	08/03/15	14:16	

STLC DI Metals by ICP-AES by EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1502507-05	B-40-0.0	ND	mg/L	1.0	0.038	20	B5H0221	08/10/2015	08/10/15	14:44	
1502507-13	B-43-0.0	0.53	mg/L	1.0	0.038	20	B5H0221	08/10/2015	08/10/15	14:53	J
1502507-21	B-45-0.0	ND	mg/L	1.0	0.038	20	B5H0221	08/10/2015	08/10/15	14:55	
1502507-37	B-49-0.0	1.7	mg/L	1.0	0.038	20	B5H0221	08/10/2015	08/10/15	14:58	
1502507-45	B-54-0.0	0.11	mg/L	1.0	0.038	20	B5H0221	08/10/2015	08/10/15	15:00	J



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/11/2015

pH by EPA 9045C

Analyte: pH

Analyst: LA

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
1502507-05	B-40-0.0	6.6	pH Units	0.10	0.10	1	B5H0106	08/05/2015	08/05/15 10:27	H1
1502507-13	B-43-0.0	7.5	pH Units	0.10	0.10	1	B5H0106	08/05/2015	08/05/15 10:27	H1
1502507-21	B-45-0.0	7.6	pH Units	0.10	0.10	1	B5H0106	08/05/2015	08/05/15 10:27	H1
1502507-37	B-49-0.0	7.8	pH Units	0.10	0.10	1	B5H0106	08/05/2015	08/05/15 10:27	H1
1502507-45	B-54-0.0	8.3	pH Units	0.10	0.10	1	B5H0106	08/05/2015	08/05/15 10:27	H1



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/11/2015

QUALITY CONTROL SECTION

Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5G0477 - EPA 3050 Modified_S									
Blank (B5G0477-BLK1)					Prepared: 7/24/2015 Analyzed: 7/24/2015				
Lead	ND	1.0					NR		
Blank (B5G0477-BLK2)					Prepared: 7/24/2015 Analyzed: 7/24/2015				
Lead	ND	1.0					NR		
LCS (B5G0477-BS1)					Prepared: 7/24/2015 Analyzed: 7/24/2015				
Lead	48.7611	1.0	50.0000		97.5	80 - 120			
Duplicate (B5G0477-DUP1)					Prepared: 7/24/2015 Analyzed: 7/24/2015				
Lead	1.94926	1.0		2.22526	NR		13.2	20	
Duplicate (B5G0477-DUP2)					Prepared: 7/24/2015 Analyzed: 7/24/2015				
Lead	4.87970	1.0		4.17505	NR		15.6	20	
Matrix Spike (B5G0477-MS1)					Prepared: 7/24/2015 Analyzed: 7/24/2015				
Lead	236.297	1.0	250.000	2.22526	93.6	35 - 129			
Matrix Spike (B5G0477-MS2)					Prepared: 7/24/2015 Analyzed: 7/24/2015				
Lead	226.230	1.0	250.000	4.17505	88.8	35 - 129			
Matrix Spike Dup (B5G0477-MSD1)					Prepared: 7/24/2015 Analyzed: 7/24/2015				
Lead	228.095	0.99	247.525	2.22526	91.3	35 - 129	3.53	20	



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/11/2015

Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
Batch B5G0478 - EPA 3050 Modified_S								
Blank (B5G0478-BLK1)								
Lead	ND	1.0						Prepared: 7/24/2015 Analyzed: 7/24/2015 NR
Blank (B5G0478-BLK2)								
Lead	ND	1.0						Prepared: 7/24/2015 Analyzed: 7/24/2015 NR
LCS (B5G0478-BS1)								
Lead	48.8307	1.0	50.0000		97.7 80 - 120			Prepared: 7/24/2015 Analyzed: 7/24/2015
Duplicate (B5G0478-DUP1)								
Lead	2.35323	1.0		1.97330			17.6 20	Source: 1502507-32 Prepared: 7/24/2015 Analyzed: 7/24/2015
Duplicate (B5G0478-DUP2)								
Lead	4.12330	1.0		4.81617			15.5 20	Source: 1502507-22 Prepared: 7/24/2015 Analyzed: 7/24/2015
Matrix Spike (B5G0478-MS1)								
Lead	228.469	1.0	250.000	1.97330	90.6 35 - 129			Source: 1502507-32 Prepared: 7/24/2015 Analyzed: 7/24/2015
Matrix Spike (B5G0478-MS2)								
Lead	222.272	1.0	250.000	4.81617	87.0 35 - 129			Source: 1502507-22 Prepared: 7/24/2015 Analyzed: 7/24/2015
Matrix Spike Dup (B5G0478-MSD1)								
Lead	227.694	1.0	250.000	1.97330	90.3 35 - 129	0.340	20	Source: 1502507-32 Prepared: 7/24/2015 Analyzed: 7/24/2015



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/11/2015

Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
Batch B5G0479 - EPA 3050 Modified_S								
Blank (B5G0479-BLK1)								
						Prepared: 7/24/2015 Analyzed: 7/27/2015		
Lead	0.588409	1.0			NR			J
Blank (B5G0479-BLK2)								
						Prepared: 7/24/2015 Analyzed: 7/27/2015		
Lead	0.382304	1.0			NR			J
LCS (B5G0479-BS1)								
						Prepared: 7/24/2015 Analyzed: 7/27/2015		
Lead	49.0614	1.0	50.0000		98.1	80 - 120		
Duplicate (B5G0479-DUP1)								
						Prepared: 7/24/2015 Analyzed: 7/27/2015		
Lead	2.81316	1.0		2.91393	NR	3.52	20	
Duplicate (B5G0479-DUP2)								
						Prepared: 7/24/2015 Analyzed: 7/27/2015		
Lead	2.51838	1.0		3.55877	NR	34.2	20	R
Matrix Spike (B5G0479-MS1)								
						Prepared: 7/24/2015 Analyzed: 7/27/2015		
Lead	227.897	1.0	250.000	2.91393	90.0	35 - 129		
Matrix Spike (B5G0479-MS2)								
						Prepared: 7/24/2015 Analyzed: 7/27/2015		
Lead	225.949	1.0	250.000	3.55877	89.0	35 - 129		
Matrix Spike Dup (B5G0479-MSD1)								
						Prepared: 7/24/2015 Analyzed: 7/27/2015		
Lead	222.918	1.0	250.000	2.91393	88.0	35 - 129	2.21	20



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/11/2015

TCLP Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
Batch B5H0215 - EPA 3010A_S								
Blank (B5H0215-BLK1)				Prepared: 8/10/2015 Analyzed: 8/10/2015				
Lead	ND	0.050			NR			
LCS (B5H0215-BS1)				Prepared: 8/10/2015 Analyzed: 8/10/2015				
Lead	0.975965	0.050	1.00000		97.6	80 - 120		
Duplicate (B5H0215-DUP1)				Source: 1502507-05 Prepared: 8/10/2015 Analyzed: 8/10/2015				
Lead	0.061057	0.050		0.066006	NR		7.79	20
Matrix Spike (B5H0215-MS1)				Source: 1502507-05 Prepared: 8/10/2015 Analyzed: 8/10/2015				
Lead	2.31271	0.050	2.50000	0.066006	89.9	77 - 121		
Matrix Spike Dup (B5H0215-MSD1)				Source: 1502507-05 Prepared: 8/10/2015 Analyzed: 8/10/2015				
Lead	2.29115	0.050	2.50000	0.066006	89.0	77 - 121	0.937	20



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/11/2015

STLC Metals by ICP-AES by EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
Batch B5H0030 - STLC_S Extraction								
Blank (B5H0030-BLK1)				Prepared: 8/3/2015 Analyzed: 8/3/2015				
Lead	ND	1.0			NR			
Blank (B5H0030-BLK2)				Prepared: 8/3/2015 Analyzed: 8/3/2015				
Lead	ND	1.0			NR			
LCS (B5H0030-BS1)				Prepared: 8/3/2015 Analyzed: 8/3/2015				
Lead	1.93744		2.00000		96.9 80 - 120			
Duplicate (B5H0030-DUP1)				Source: 1502519-01 Prepared: 8/3/2015 Analyzed: 8/3/2015				
Lead	6.21358	1.0		7.89888	NR	23.9	20	R
Duplicate (B5H0030-DUP2)				Source: 1502532-03 Prepared: 8/3/2015 Analyzed: 8/3/2015				
Lead	5.04561	1.0		5.44551	NR	7.62	20	
Matrix Spike (B5H0030-MS1)				Source: 1502519-01 Prepared: 8/3/2015 Analyzed: 8/3/2015				
Lead	10.0719		2.50000	7.89888	86.9	44 - 130		
Matrix Spike (B5H0030-MS2)				Source: 1502532-03 Prepared: 8/3/2015 Analyzed: 8/3/2015				
Lead	7.52195		2.50000	5.44551	83.1	44 - 130		
Matrix Spike Dup (B5H0030-MSD1)				Source: 1502519-01 Prepared: 8/3/2015 Analyzed: 8/3/2015				
Lead	10.1086		2.50000	7.89888	88.4	44 - 130	0.364	20



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/11/2015

STLC DI Metals by ICP-AES by EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
Batch B5H0221 - STLC DI_S Extraction								
Blank (B5H0221-BLK1)				Prepared: 8/10/2015 Analyzed: 8/10/2015				
Lead	ND	1.0			NR			
LCS (B5H0221-BS1)				Prepared: 8/10/2015 Analyzed: 8/10/2015				
Lead	2.05268		2.00000		103 80 - 120			
Duplicate (B5H0221-DUP1)				Source: 1502507-05 Prepared: 8/10/2015 Analyzed: 8/10/2015				
Lead	ND	1.0		ND	NR		20	
Matrix Spike (B5H0221-MS1)				Source: 1502507-05 Prepared: 8/10/2015 Analyzed: 8/10/2015				
Lead	2.56417		2.50000	0.025044	102 70 - 130			
Matrix Spike Dup (B5H0221-MSD1)				Source: 1502507-05 Prepared: 8/10/2015 Analyzed: 8/10/2015				
Lead	2.60978		2.50000	0.025044	103 70 - 130	1.76	20	



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/11/2015

pH by EPA 9045C - Quality Control

Analyte	Result (pH Units)	PQL (pH Units)	Spike Level	Source Result	% Rec % Rec	% Rec Limits	RPD	RPD Limit	Notes
---------	----------------------	-------------------	----------------	------------------	----------------	-----------------	-----	--------------	-------

Batch B5H0106 - Prep_WC1_S

Duplicate (B5H0106-DUP1)

Source: 1502507-05

Prepared: 8/5/2015 Analyzed: 8/5/2015

pH	6.50000	0.10		6.64000	NR		2.13	20	
----	---------	------	--	---------	----	--	------	----	--



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/11/2015

Notes and Definitions

R	RPD value outside acceptance criteria. Calculation is based on raw values.
J	Analyte detected below the Practical Quantitation Limit but above or equal to the Method Detection Limit. Result is an estimated concentration.
H1	Sample was received past holding time.
ND	Analyte is not detected at or above the Practical Quantitation Limit (PQL). When client requests quantitation against MDL, analyte is not detected at or above the Method Detection Limit (MDL)
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
NR	Not Reported
RPD	Relative Percent Difference
CA2	CA-ELAP (CDPH)
OR1	OR-NELAP (OSPHL)
TX1	TX-NELAP (TCEQ)

Notes:

- (1) The reported MDL and PQL are based on prep ratio variation and analytical dilution.
- (2) The suffix [2C] of specific analytes signifies that the reported result is taken from the instrument's second column.
- (3) Results are wet unless otherwise specified.

CHAIN OF CUSTODY RECORD



**Advanced Technology
Laboratories**

3275 Walnut Avenue
Signal Hill, CA 90755
Tel: (562) 989-4045 • Fax: (562) 989-4040

FOR LABORATORY USE ONLY

P.O. #: _____	Method of Transport Client <input type="checkbox"/> ATL <input checked="" type="checkbox"/> CA OverN <input type="checkbox"/> FedEx <input type="checkbox"/> Other: _____	Sample Condition Upon Receipt 1. CHILLED Y <input type="checkbox"/> N <input type="checkbox"/> 4. SEALED Y <input type="checkbox"/> N <input type="checkbox"/> 2. HEADSPACE (VOA) Y <input type="checkbox"/> N <input type="checkbox"/> 5. # OF SPLS MATCH COC Y <input type="checkbox"/> N <input type="checkbox"/> 3. CONTAINER INTACT Y <input type="checkbox"/> N <input type="checkbox"/> 6. PRESERVED Y <input type="checkbox"/> N <input type="checkbox"/>
---------------	--	--

Client: Geocon Attention: Mike Conkle	Address: 3303 North San Fernando Blvd Suite 100 City: Burbank State: CA Zip Code: 91504	Tel: 818-841-8388 Fax: 818-841-1704
--	--	--

Project Name: State Route 405 ADL	Project #: S9890-06-10	Sampler: <i>Mike Hoots</i>	Received by: <i>Edward Rodriguez</i>
Relinquished by: <i>Mike Hoots</i> Date: <i>7/20/15</i> Time: <i>1612</i>	Relinquished by: <i>Edward Rodriguez</i> Date: <i>7-20-15</i> Time: <i>1745</i>	Relinquished by: _____ Date: _____ Time: _____	Relinquished by: _____ Date: _____ Time: _____

I hereby authorize ATL to perform the work indicated below: Project Mgr /Submitter: Mike Conkle <i>Mike Conkle</i> Signature Date	Send Report To: Attn: Mike Conkle Co: Geocon Consultants Inc. Addr: 3303 North San Fernando Blvd Suite 100 City: Burbank State: CA Zip: 91504	Bill To: Attn: Mike Conkle Co: Geocon Consultants Inc. Addr: 3303 North San Fernando Blvd Suite 100 City: Burbank State: CA Zip: 91504	Special Instructions/Comments: CT Contract 12A1535 Run samples with total lead greater than or equal to 50 mg/kg by WET. Run samples with WET results greater than or equal to 5.0 mg/l by DI-WET. Run samples with total lead greater than or equal to 1,000 mg/kg for TCLP only
---	---	--	--

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):
 ■ Sample :\$2.00 / sample /mo (after 45 days)
 ■ Records: \$1 /ATL workorder /mo (after 1 year)

ITEM	LAB USE ONLY:				Date	Time	Lead	SPECIFY APPROPRIATE MATRIX				TAT	Container(s)		PRESERVATION	REMARKS		
	Lab No.	Sample ID / Location	Date	Time				SOIL	WATER	GROUND WATER	WASTEWATER		#	Type			QA/QC	
																	RTNE <input type="checkbox"/>	CT <input type="checkbox"/>
1	15-39-0.0	7/20/15	1208	x							E	1	G	J				
2	15-39-1.0		1211	x							E	1	G	J				
3	15-39-2.5		1214	x							E	1	G	J				
4	15-39-3.5		1216	x							E	1	G	J				
5	15-40-0.0		1153	x							E	1	G	J				
6	15-40-1.0		1155	x							E	1	G	J				
7	15-40-2.5		1201	x							E	1	G	J				
8	15-40-3.5		1203	x							E	1	G	J				
9	15-41-0.0		1133	x							E	1	G	J				
10	15-41-1.0		1135	x							E	1	G	J				
11	15-41-2.5		1147	x							E	1	G	J				
12	15-41-3.5		1149	x							E	1	G	J				
13	15-43-0.0		1100	x							E	1	G	J				
14	15-43-1.0		1112	x							E	1	G	J				
15	15-43-2.5		1114	x							E	1	G	J				
16	15-43-3.5		1116	x							E	1	G	J				
17	15-44-0.0		1044	x							E	1	G	J				
18	15-44-1.0		1047	x							E	1	G	J				
19	15-44-2.5		1050	x							E	1	G	J				
20	15-44-3.5		1053	x							E	1	G	J				

■ TAT starts 8AM the following day if samples received after 3 PM TAT: <input type="checkbox"/> A = Overnight ≤ 24 hrs <input type="checkbox"/> B = Emergency Next Workday <input type="checkbox"/> C = Critical 2 Workdays <input type="checkbox"/> D = Urgent 3 Workdays <input checked="" type="checkbox"/> E = Routine 7 Workdays	Preservatives: H=HCl N=HNO ₃ S=H ₂ SO ₄ C=4°C Z=Zn(AC) ₂ O=NaOH T=Na ₂ S ₂ O ₃
Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal	

CHAIN OF CUSTODY RECORD



**Advanced Technology
Laboratories**

3275 Walnut Avenue
Signal Hill, CA 90755
Tel: (562) 989-4045 • Fax: (562) 989-4040

FOR LABORATORY USE ONLY

Method of Transport

- Client
- ATL
- CA OverN
- FedEx
- Other:

Sample Condition Upon Receipt

- 1. CHILLED Y N 4. SEALED Y N
- 2. HEADSPACE (VOA) Y N 5. # OF SPLS MATCH COC Y N
- 3. CONTAINER INTACT Y N 6. PRESERVED Y N

P.O. #: _____

Logged By: _____ Date: _____

Client: Geocon

Address: 3303 North San Fernando Blvd Suite 100

Tel: 818-841-8388

Attention: Mike Conkle

City: Burbank

State: CA

Zip Code: 91504

Fax: 818-841-1704

Project Name: State Route 405 ADP

Project#: S9890-06-10

Sampler: _____

(Signature)

Relinquished by: (Signature and Printed Name) Mike Conkle Date: 7/20/15 Time: 1612 Received by: (Signature and Printed Name) Edward Rodriguez Date: 7-20-15 Time: 1612

Relinquished by: (Signature and Printed Name) Edward Rodriguez Date: 7-20-15 Time: 1745 Received by: (Signature and Printed Name) C. Frank Date: 7/20/15 Time: 1745

Relinquished by: (Signature and Printed Name) _____ Date: _____ Time: _____ Received by: (Signature and Printed Name) _____ Date: _____ Time: _____

I hereby authorize ATL to perform the work indicated below:

Send Report To:

Bill To:

Special Instructions/Comments:

Project Mgr /Submitter: Mike Conkle 7/20/15

Attn: Mike Conkle

Attn: Mike Conkle

CT Contract 12A1535 Run samples with total lead greater than or equal to 50 mg/kg by WET. Run samples with WET results greater than or equal to 5.0 mg/l by DI-WET. Run samples with total lead greater than or equal to 1,000 mg/kg for TCLP only

Co: Geocon Consultants Inc.

Co: Geocon Consultants Inc.

Co: Geocon Consultants Inc.

Print Name: Mike Conkle Date: _____

Addr: 3303 North San Fernando Blvd Suite 100

Addr: 3303 North San Fernando Blvd Suite 100

Signature: Mike Conkle

City: Burbank State: CA Zip: 91504

City: Burbank State: CA Zip: 91504

Sample/Records - Archival & Disposal

Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):

- Sample: \$2.00 / sample /mo (after 45 days)
- Records: \$1 /ATL workorder /mo (after 1 year)

Circle or Add Analysis(es) Requested	SPECIFY APPROPRIATE MATRIX				Container(s) TAT # Type	PRESERVATION RTNE <input type="checkbox"/> CT <input type="checkbox"/> SWRCB Logcode <input type="checkbox"/> OTHER _____ REMARKS
	SOIL	WATER	GROUND WATER	WASTEWATER		
Lead						

ITEM	LAB USE ONLY:		Sample Description		
	Lab No.	Sample ID / Location	Date	Time	
	1807507-14	B-45-0.0	7/20/15	1024	x
	17	B-45-1.0		1029	x
	17	B-45-2.5		1036	x
	20	B-45-3.5		1039	x
	18	B-46-0.0		1014	x
	24	B-46-1.0		1017	x
	25	B-46-2.5		1018	x
	28	B-46-3.5		1019	x
	29	B-47-0.0		1001	x
	20	B-47-1.0		1005	x
	21	B-47-2.5		1009	x
	22	B-47-3.5		1010	x
	27	B-48-0.0		0943	x
	34	B-48-1.0		0944	x
	35	B-48-2.5		0949	x
	26	B-48-3.5		0951	x
	17	B-49-0.0		0845	x
	24	B-49-1.0		0847	x
	29	B-49-2.5		0851	x
	40	B-49-3.5		0852	x

TAT starts 8AM the following day if samples received after 3 PM
 TAT: A = Overnight ≤ 24 hrs B = Emergency Next Workday C = Critical 2 Workdays D = Urgent 3 Workdays E = Routine 7 Workdays
 Preservatives: H=HCl N=HNO₃ S=H₂SO₄ C=4°C
 Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal
 Z=Zn(AC)₂ O=NaOH T=Na₂S₂O₃

Diane Galvan

From: Mike Conkle [conkle@geoconinc.com]
Sent: Wednesday, July 29, 2015 2:31 PM
To: Diane Galvan
Subject: State Route 405 ADL

Diane,

For this project please also run TCLP soluble lead and pH on all results with WET soluble lead concentrations greater than or equal to 5.0 mg/l.



Michael P. Conkle, PG | *Senior Geologist*
Geocon

3303 N. San Fernando Blvd. Suite 100, Burbank, CA 91504

Tel 818.841.8388 Fax 818.841.1704 Cell 213.503.7841

Visit our NEW website at www.geoconinc.com

San Diego / Los Angeles / Irvine / Murrieta / Palm Desert / Sacramento / Livermore / Bakersfield

August 11, 2015

Mike Conkle
Geocon West, Inc.
3303 N. San Fernando Blvd., Suite 100
Burbank, CA 91504
Tel: (818) 841-8388
Fax: (818) 841-1704

ELAP No.: 1838
CSDLAC No.: 10196
ORELAP No.: CA300003
TCEQ No. : T104704502

Re: ATL Work Order Number : 1502519
Client Reference : State Route 405 ADL, S9890-06-10

Enclosed are the results for sample(s) received on July 21, 2015 by Advanced Technology Laboratories. The sample(s) are tested for the parameters as indicated on the enclosed chain of custody in accordance with applicable laboratory certifications. The laboratory results contained in this report specifically pertains to the sample(s) submitted.

Thank you for the opportunity to serve the needs of your company. If you have any questions, please feel free to contact me or your Project Manager.

Sincerely,



Eddie Rodriguez
Laboratory Director

The cover letter and the case narrative are an integral part of this analytical report and its absence renders the report invalid. Test results contained within this data package meet the requirements of applicable state-specific certification programs. The report cannot be reproduced without written permission from the client and Advanced Technology Laboratories.



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/11/2015

SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B-28-0.0	1502519-01	Soil	7/21/15 8:40	7/21/15 13:02
B-28-1.0	1502519-02	Soil	7/21/15 8:42	7/21/15 13:02
B-28-2.5	1502519-03	Soil	7/21/15 8:44	7/21/15 13:02
B-28-3.5	1502519-04	Soil	7/21/15 8:46	7/21/15 13:02
B-34-0.0	1502519-05	Soil	7/21/15 8:05	7/21/15 13:02
B-34-1.0	1502519-06	Soil	7/21/15 8:17	7/21/15 13:02
B-34-2.5	1502519-07	Soil	7/21/15 8:25	7/21/15 13:02
B-34-3.5	1502519-08	Soil	7/21/15 8:28	7/21/15 13:02
B-61-0.0	1502519-09	Soil	7/21/15 11:20	7/21/15 13:02
B-61-1.0	1502519-10	Soil	7/21/15 11:22	7/21/15 13:02
B-61-2.5	1502519-11	Soil	7/21/15 11:25	7/21/15 13:02
B-61-3.5	1502519-12	Soil	7/21/15 11:26	7/21/15 13:02
B-62-0.0	1502519-13	Soil	7/21/15 11:04	7/21/15 13:02
B-62-1.0	1502519-14	Soil	7/21/15 11:09	7/21/15 13:02
B-62-2.5	1502519-15	Soil	7/21/15 11:12	7/21/15 13:02
B-62-3.5	1502519-16	Soil	7/21/15 11:14	7/21/15 13:02
B-63-0.0	1502519-17	Soil	7/21/15 10:48	7/21/15 13:02
B-63-1.0	1502519-18	Soil	7/21/15 10:52	7/21/15 13:02
B-63-2.5	1502519-19	Soil	7/21/15 10:55	7/21/15 13:02
B-63-3.5	1502519-20	Soil	7/21/15 10:57	7/21/15 13:02
B-64-0.0	1502519-21	Soil	7/21/15 10:28	7/21/15 13:02
B-64-1.0	1502519-22	Soil	7/21/15 10:36	7/21/15 13:02
B-64-2.5	1502519-23	Soil	7/21/15 10:42	7/21/15 13:02
B-64-3.5	1502519-24	Soil	7/21/15 10:45	7/21/15 13:02
B-65-0.0	1502519-25	Soil	7/21/15 10:16	7/21/15 13:02
B-65-1.0	1502519-26	Soil	7/21/15 10:18	7/21/15 13:02
B-65-2.5	1502519-27	Soil	7/21/15 10:21	7/21/15 13:02
B-65-3.5	1502519-28	Soil	7/21/15 10:22	7/21/15 13:02



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/11/2015

CASE NARRATIVE

Results were J-flagged. "J" is used to flag those results that are between the PQL (Practical Quantitation Limit) and the calculated MDL (Method Detection Limit). Results that are "J" flagged are estimated values since it becomes difficult to accurately quantitate the analyte near the MDL.



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/11/2015

Lead by ICP-AES EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time		Notes
									Analized		
1502519-01	B-28-0.0	100	mg/kg	1.0	0.16	1	B5G0480	07/24/2015	07/27/15	09:03	
1502519-02	B-28-1.0	5.4	mg/kg	1.0	0.16	1	B5G0480	07/24/2015	07/27/15	09:04	
1502519-03	B-28-2.5	8.3	mg/kg	1.0	0.16	1	B5G0480	07/24/2015	07/27/15	09:05	
1502519-04	B-28-3.5	2.8	mg/kg	1.0	0.16	1	B5G0480	07/24/2015	07/27/15	09:06	
1502519-05	B-34-0.0	40	mg/kg	1.0	0.16	1	B5G0480	07/24/2015	07/27/15	09:07	
1502519-06	B-34-1.0	5.6	mg/kg	1.0	0.16	1	B5G0480	07/24/2015	07/27/15	09:08	
1502519-07	B-34-2.5	4.4	mg/kg	1.0	0.16	1	B5G0480	07/24/2015	07/27/15	09:10	
1502519-08	B-34-3.5	1.6	mg/kg	1.0	0.16	1	B5G0480	07/24/2015	07/27/15	09:38	
1502519-09	B-61-0.0	12	mg/kg	1.0	0.16	1	B5G0480	07/24/2015	07/27/15	09:12	
1502519-10	B-61-1.0	3.4	mg/kg	1.0	0.16	1	B5G0480	07/24/2015	07/27/15	09:16	
1502519-11	B-61-2.5	2.7	mg/kg	1.0	0.16	1	B5G0480	07/24/2015	07/27/15	09:40	
1502519-12	B-61-3.5	1.9	mg/kg	1.0	0.16	1	B5G0480	07/24/2015	07/27/15	09:20	
1502519-13	B-62-0.0	21	mg/kg	1.0	0.16	1	B5G0480	07/24/2015	07/27/15	09:22	
1502519-14	B-62-1.0	2.9	mg/kg	1.0	0.16	1	B5G0480	07/24/2015	07/27/15	09:23	
1502519-15	B-62-2.5	2.5	mg/kg	1.0	0.16	1	B5G0480	07/24/2015	07/27/15	09:24	
1502519-16	B-62-3.5	2.6	mg/kg	1.0	0.16	1	B5G0480	07/24/2015	07/27/15	09:25	
1502519-17	B-63-0.0	8.6	mg/kg	1.0	0.16	1	B5G0480	07/24/2015	07/27/15	09:27	
1502519-18	B-63-1.0	3.2	mg/kg	1.0	0.16	1	B5G0480	07/24/2015	07/27/15	09:31	
1502519-19	B-63-2.5	4.5	mg/kg	1.0	0.16	1	B5G0480	07/24/2015	07/27/15	09:32	
1502519-20	B-63-3.5	4.6	mg/kg	1.0	0.16	1	B5G0480	07/24/2015	07/27/15	09:33	
1502519-21	B-64-0.0	4.8	mg/kg	1.0	0.16	1	B5G0481	07/24/2015	07/27/15	09:47	
1502519-22	B-64-1.0	3.6	mg/kg	1.0	0.16	1	B5G0481	07/24/2015	07/27/15	09:48	
1502519-23	B-64-2.5	3.6	mg/kg	1.0	0.16	1	B5G0481	07/24/2015	07/27/15	09:49	
1502519-24	B-64-3.5	2.9	mg/kg	1.0	0.16	1	B5G0481	07/24/2015	07/27/15	09:50	
1502519-25	B-65-0.0	7.6	mg/kg	1.0	0.16	1	B5G0481	07/24/2015	07/27/15	09:52	
1502519-26	B-65-1.0	1.0	mg/kg	1.0	0.16	1	B5G0481	07/24/2015	07/27/15	09:53	
1502519-27	B-65-2.5	1.6	mg/kg	1.0	0.16	1	B5G0481	07/24/2015	07/27/15	09:54	
1502519-28	B-65-3.5	3.5	mg/kg	1.0	0.16	1	B5G0481	07/24/2015	07/27/15	09:55	



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/11/2015

TCLP Metals by ICP-AES EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
1502519-01	B-28-0.0	0.11	mg/L	0.050	0.0019	1	B5H0215	08/10/2015	08/10/15 13:11	

STLC Metals by ICP-AES by EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
1502519-01	B-28-0.0	7.9	mg/L	1.0	0.038	20	B5H0030	08/03/2015	08/03/15 14:18	

STLC DI Metals by ICP-AES by EPA 6010B

Analyte: Lead

Analyst: RR

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
1502519-01	B-28-0.0	ND	mg/L	1.0	0.038	20	B5H0221	08/10/2015	08/10/15 15:06	

pH by EPA 9045C

Analyte: pH

Analyst: LA

Laboratory ID	Client Sample ID	Result	Units	PQL	MDL	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
1502519-01	B-28-0.0	8.6	pH Units	0.10	0.10	1	B5H0068	08/04/2015	08/04/15 13:57	



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/11/2015

QUALITY CONTROL SECTION

Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5G0480 - EPA 3050 Modified_S									
Blank (B5G0480-BLK1)									
Lead	0.932150	1.0							J
Blank (B5G0480-BLK2)									
Lead	ND	1.0							
LCS (B5G0480-BS1)									
Lead	48.0851	1.0	50.0000		96.2	80 - 120			
Duplicate (B5G0480-DUP1)									
				Source: 1502519-20					
Lead	5.20759	1.0		4.63696	NR		11.6	20	
Duplicate (B5G0480-DUP2)									
				Source: 1502519-10					
Lead	3.02200	1.0		3.38255	NR		11.3	20	
Matrix Spike (B5G0480-MS1)									
				Source: 1502519-20					
Lead	225.690	1.0	250.000	4.63696	88.4	35 - 129			
Matrix Spike (B5G0480-MS2)									
				Source: 1502519-10					
Lead	211.096	1.0	250.000	3.38255	83.1	35 - 129			
Matrix Spike Dup (B5G0480-MSD1)									
				Source: 1502519-20					
Lead	231.441	1.0	250.000	4.63696	90.7	35 - 129	2.52	20	



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/11/2015

Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5G0481 - EPA 3050 Modified_S									
Blank (B5G0481-BLK1)									
Lead	ND	1.0							Prepared: 7/24/2015 Analyzed: 7/27/2015 NR
Blank (B5G0481-BLK2)									
Lead	ND	1.0							Prepared: 7/24/2015 Analyzed: 7/27/2015 NR
LCS (B5G0481-BS1)									
Lead	48.5380	1.0	50.0000		97.1	80 - 120			Prepared: 7/24/2015 Analyzed: 7/27/2015
Duplicate (B5G0481-DUP1)									
Lead	101.178	1.0		85.1822			17.2	20	Source: 1502532-03 Prepared: 7/24/2015 Analyzed: 7/27/2015
Duplicate (B5G0481-DUP2)									
Lead	116.606	1.0		101.140			14.2	20	Source: 1502532-02 Prepared: 7/24/2015 Analyzed: 7/27/2015
Matrix Spike (B5G0481-MS1)									
Lead	316.997	1.0	252.525	85.1822	91.8	35 - 129			Source: 1502532-03 Prepared: 7/24/2015 Analyzed: 7/27/2015
Matrix Spike (B5G0481-MS2)									
Lead	288.896	1.0	250.000	101.140	75.1	35 - 129			Source: 1502532-02 Prepared: 7/24/2015 Analyzed: 7/27/2015
Matrix Spike Dup (B5G0481-MSD1)									
Lead	323.629	1.0	250.000	85.1822	95.4	35 - 129	2.07	20	Source: 1502532-03 Prepared: 7/24/2015 Analyzed: 7/27/2015



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/11/2015

TCLP Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
Batch B5H0215 - EPA 3010A_S								
Blank (B5H0215-BLK1)				Prepared: 8/10/2015 Analyzed: 8/10/2015				
Lead	ND	0.050			NR			
LCS (B5H0215-BS1)				Prepared: 8/10/2015 Analyzed: 8/10/2015				
Lead	0.975965	0.050	1.00000		97.6	80 - 120		
Duplicate (B5H0215-DUP1)				Prepared: 8/10/2015 Analyzed: 8/10/2015				
	Source: 1502507-05							
Lead	0.061057	0.050		0.066006	NR		7.79	20
Matrix Spike (B5H0215-MS1)				Prepared: 8/10/2015 Analyzed: 8/10/2015				
	Source: 1502507-05							
Lead	2.31271	0.050	2.50000	0.066006	89.9	77 - 121		
Matrix Spike Dup (B5H0215-MSD1)				Prepared: 8/10/2015 Analyzed: 8/10/2015				
	Source: 1502507-05							
Lead	2.29115	0.050	2.50000	0.066006	89.0	77 - 121	0.937	20



Certificate of Analysis

Geocon West, Inc.
 3303 N. San Fernando Blvd., Suite 100
 Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10
 Report To : Mike Conkle
 Reported : 08/11/2015

STLC Metals by ICP-AES by EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec Limits	RPD	RPD Limit	Notes
Batch B5H0030 - STLC_S Extraction								
Blank (B5H0030-BLK1)								
Lead	ND	1.0			NR			
Blank (B5H0030-BLK2)								
Lead	ND	1.0			NR			
LCS (B5H0030-BS1)								
Lead	1.93744		2.00000		96.9 80 - 120			
Duplicate (B5H0030-DUP1)								
Lead	6.21358			7.89888	NR	23.9	20	R
Duplicate (B5H0030-DUP2)								
Lead	5.04561			5.44551	NR	7.62	20	
Matrix Spike (B5H0030-MS1)								
Lead	10.0719		2.50000	7.89888	86.9 44 - 130			
Matrix Spike (B5H0030-MS2)								
Lead	7.52195		2.50000	5.44551	83.1 44 - 130			
Matrix Spike Dup (B5H0030-MSD1)								
Lead	10.1086		2.50000	7.89888	88.4 44 - 130	0.364	20	



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/11/2015

STLC DI Metals by ICP-AES by EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
---------	------------------	---------------	----------------	------------------	-------	-----------------	-----	--------------	-------

Batch B5H0221 - STLC DI_S Extraction

Blank (B5H0221-BLK1)

Prepared: 8/10/2015 Analyzed: 8/10/2015

Lead	ND	1.0		NR	
------	----	-----	--	----	--

LCS (B5H0221-BS1)

Prepared: 8/10/2015 Analyzed: 8/10/2015

Lead	2.05268		2.00000	103	80 - 120
------	---------	--	---------	-----	----------

Duplicate (B5H0221-DUP1)

Source: 1502507-05

Prepared: 8/10/2015 Analyzed: 8/10/2015

Lead	ND	1.0		ND	NR		20
------	----	-----	--	----	----	--	----

Matrix Spike (B5H0221-MS1)

Source: 1502507-05

Prepared: 8/10/2015 Analyzed: 8/10/2015

Lead	2.56417		2.50000	0.025044	102	70 - 130
------	---------	--	---------	----------	-----	----------

Matrix Spike Dup (B5H0221-MSD1)

Source: 1502507-05

Prepared: 8/10/2015 Analyzed: 8/10/2015

Lead	2.60978		2.50000	0.025044	103	70 - 130	1.76	20
------	---------	--	---------	----------	-----	----------	------	----



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/11/2015

pH by EPA 9045C - Quality Control

Analyte	Result (pH Units)	PQL (pH Units)	Spike Level	Source Result	% Rec % Rec	% Rec Limits	RPD	RPD Limit	Notes
---------	----------------------	-------------------	----------------	------------------	----------------	-----------------	-----	--------------	-------

Batch B5H0068 - Prep_WC1_S

Duplicate (B5H0068-DUP1)

Source: 1502480-15

Prepared: 8/4/2015 Analyzed: 8/4/2015

pH	10.0100	0.10		9.33000	NR		7.03	20	
----	---------	------	--	---------	----	--	------	----	--



Certificate of Analysis

Geocon West, Inc.

3303 N. San Fernando Blvd., Suite 100

Burbank, CA 91504

Project Number : State Route 405 ADL, S9890-06-10

Report To : Mike Conkle

Reported : 08/11/2015

Notes and Definitions

R	RPD value outside acceptance criteria. Calculation is based on raw values.
J	Analyte detected below the Practical Quantitation Limit but above or equal to the Method Detection Limit. Result is an estimated concentration.
ND	Analyte is not detected at or above the Practical Quantitation Limit (PQL). When client requests quantitation against MDL, analyte is not detected at or above the Method Detection Limit (MDL)
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
NR	Not Reported
RPD	Relative Percent Difference
CA2	CA-ELAP (CDPH)
OR1	OR-NELAP (OSPHL)
TX1	TX-NELAP (TCEQ)

Notes:

- (1) The reported MDL and PQL are based on prep ratio variation and analytical dilution.
- (2) The suffix [2C] of specific analytes signifies that the reported result is taken from the instrument's second column.
- (3) Results are wet unless otherwise specified.

CHAIN OF CUSTODY RECORD



**Advanced Technology
Laboratories**

3275 Walnut Avenue
Signal Hill, CA 90755
Tel: (562) 989-4045 • Fax: (562) 989-4040

FOR LABORATORY USE ONLY

P.O. #: _____
Logged By: _____ Date: _____

Method of Transport
Client ATL
CA OverN FedEx Other: _____

Sample Condition Upon Receipt
1. CHILLED Y N 4. SEALED Y N
2. HEADSPACE (VOA) Y N 5. # OF SPLS MATCH COC Y N
3. CONTAINER INTACT Y N 6. PRESERVED Y N

Client: Geocon Attention: Mike Conkle
Address: 3303 North San Fernando Blvd Suite 100 City: Burbank State: CA Zip Code: 91504
Tel: 818-841-8388 Fax: 818-841-1704
Project Name: State Route 405 ADL Project #: S9890-06-10 Sampler: *Mike Alcofs* (Signature)
Relinquished by: *Mike Alcofs* Date: 7/21/15 Time: 1302 Received by: *Proton* Date: 7/21/15 Time: 1302

I hereby authorize ATL to perform the work indicated below:
Project Mgr / Submitter: *Mike Conkle* Date: 7/21/15
Mike Alcofs (Signature)

Send Report To:
Attn: Mike Conkle
Co: Geocon Consultants Inc.
Addr: 3303 North San Fernando Blvd Suite 100
City: Burbank State: CA Zip: 91504

Bill To:
Attn: Mike Conkle
Co: Geocon Consultants Inc.
Addr: 3303 North San Fernando Blvd Suite 100
City: Burbank State: CA Zip: 91504

Special Instructions/Comments:
CT Contract 12A1535 Run samples with total lead greater than or equal to 50 mg/kg by WET. Run samples with WET results greater than or equal to 5.0 mg/l by DI-WET. Run samples with total lead greater than or equal to 1,000 mg/kg for TCLP only

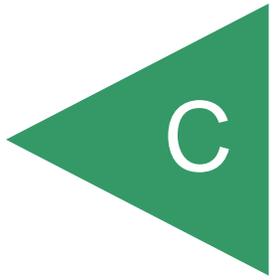
Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.
Storage Fees (applies when storage is requested):
■ Sample: \$2.00 / sample /mo (after 45 days)
■ Records: \$1 /ATL workorder /mo (after 1 year)

Circle or Add Analysis(es) Requested	SPECIFY APPROPRIATE MATRIX				TAT	#	Type	PRESERVATION	REMARKS
	SOIL	WATER	GROUND WATER	WASTEWATER					
Lead					E	1	G J	RTNE <input type="checkbox"/> CT <input type="checkbox"/>	
					E	1	G J	SWRCB <input type="checkbox"/> Logcode _____	
					E	1	G J	OTHER _____	
					E	1	G J		

ITEM	LAB USE ONLY:		Sample Description		Date	Time
	Lab No.	Sample ID / Location				
	1502519-21	B-64-0.0			7/21/15	1028
	-22	B-64-1.0				1036
	-23	B-64-2.5				1042
	-24	B-64-3.5				1045
	-25	B-65-0.0				1076
	-26	B-65-1.0				1018
	-27	B-65-2.5				1021
	-28	B-65-3.5				1022

■ TAT starts 8AM the following day if samples received after 3 PM
TAT: A = Overnight ≤ 24 hrs B = Emergency Next Workday C = Critical 2 Workdays D = Urgent 3 Workdays E = Routine 7 Workdays
Preservatives: H=HCl N=HNO₃ S=H₂SO₄ C=4°C Z=Zn(AC)₂ O=NaOH T=Na₂S₂O₃
Container Types: T=Tube V=VOA L=Liter P=Pin J=Jar B=Tedlar G=Glass P=Plastic M=Metal

APPENDIX



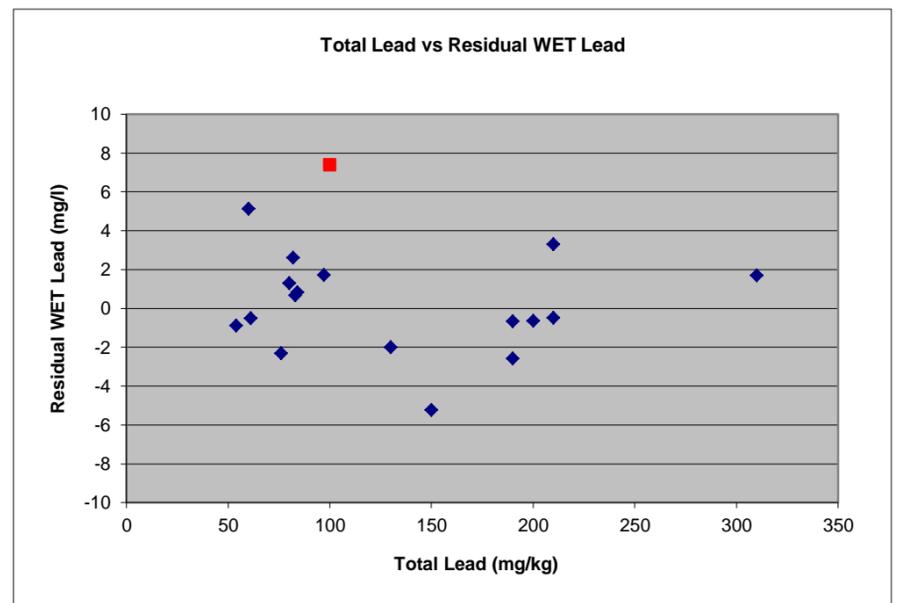
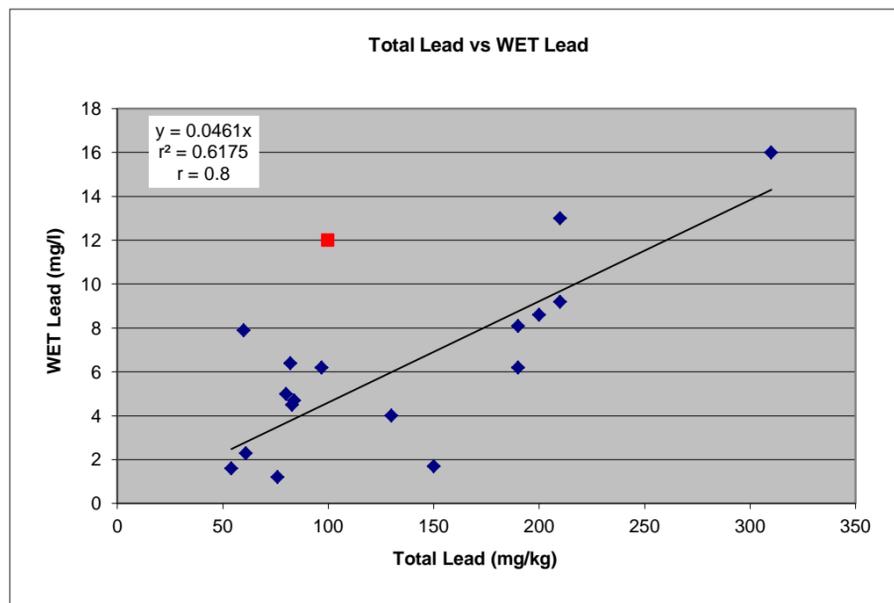
Project Name: Interstate 405 from SB Culver Drive Offramp to Jeffrey Road/University Drive OC
 Geocon Project No.: S9890-06-10

Sample ID	Total Lead (mg/kg)	WET Lead (mg/l)	Residual WET Lead (mg/l)	Squared Residual WET Lead (mg/l)
B-41-0.0	83	4.5	0.67	0.45
B-52-0.0	61	2.3	-0.51	0.26
B-39-0.0	84	4.7	0.82	0.68
B-56-0.0	210	9.2	-0.49	0.24
B-20-1.0	54	1.6	-0.89	0.79
B-59-0.0	200	8.6	-0.63	0.39
B-49-0.0	190	8.1	-0.67	0.44
B-57-0.0	310	16	1.70	2.88
B-54-0.0	80	5.0	1.31	1.71
B-51-0.0	97	6.2	1.72	2.97
B-53-0.0	130	4.0	-2.00	3.99
B-1-0.0	76	1.2	-2.31	5.32
B-45-0.0	82	6.4	2.62	6.85
B-12-1.0	190	6.2	-2.57	6.59
B-43-0.0	210	13	3.31	10.96
B-33-0.0	60	7.9	5.13	26.33
B-15-0.0	150	1.7	-5.22	27.26

slope	y-intercept	predicted WET	residual WET
0.0461	0	3.8	0.67
		2.8	-0.51
		3.9	0.82
		9.7	-0.49
		2.5	-0.89
		9.2	-0.63
		8.8	-0.67
		14.3	1.70
		3.7	1.31
		4.5	1.72
		6.0	-2.00
		3.5	-2.31
		3.8	2.62
		8.8	-2.57
		9.7	3.31
		2.8	5.13
		6.9	-5.22

Not Used

B-40-0.0	100	12	7.39	54.55	4.6	7.39
----------	-----	----	------	-------	-----	------



Project Name: Interstate 405 from SB Culver Drive Offramp to Jeffrey Road/University Drive OC
Geocon Project No.: S9890-06-10
Sample Population: Borings B1 to B6, B8 to B27, B29 to B33, B35 to B38, and B42
Sample Location: Median

Lead - 0.0 to 0.5 ft

Total Number of Observations	36	Number of Distinct Observations	27
		Number of Missing Observations	0
Minimum	3.2	Mean	30.5
Maximum	150	Median	24.5
SD	25.35	Std. Error of Mean	4.226
Coefficient of Variation	0.831	Skewness	3.271
Mean of logged data	3.191	SD of logged data	0.681
		90% Standard Bootstrap UCL	35.8
		95% Standard Bootstrap UCL	37.4

Lead - 1 to 1.5 ft

Total Number of Observations	36	Number of Distinct Observations	30
		Number of Missing Observations	0
Minimum	1.5	Mean	22.1
Maximum	190	Median	13
SD	32.02	Std. Error of Mean	5.337
Coefficient of Variation	1.451	Skewness	4.372
Mean of logged data	2.582	SD of logged data	0.982
		90% Standard Bootstrap UCL	28.7
		95% Standard Bootstrap UCL	30.7

Lead - 2.5 to 3 ft

Total Number of Observations	25	Number of Distinct Observations	20
		Number of Missing Observations	0
Minimum	1.3	Mean	6.1
Maximum	32	Median	3.3
SD	6.756	Std. Error of Mean	1.351
Coefficient of Variation	1.109	Skewness	2.821
Mean of logged data	1.454	SD of logged data	0.781
		90% Standard Bootstrap UCL	7.8
		95% Standard Bootstrap UCL	8.3

Lead - 3.5 to 4 ft

Total Number of Observations	24	Number of Distinct Observations	19
		Number of Missing Observations	0
Minimum	1.4	Mean	4.8
Maximum	22	Median	2.8
SD	5.018	Std. Error of Mean	1.024
Coefficient of Variation	1.043	Skewness	2.418
Mean of logged data	1.249	SD of logged data	0.738
		90% Standard Bootstrap UCL	6.1
		95% Standard Bootstrap UCL	6.5

Project Name: Interstate 405 from SB Culver Drive Offramp to Jeffrey Road/University Drive OC
Geocon Project No.: S9890-06-10
Sample Population: Borings B34, B39 to B41, and B43 to B48
Sample Location: SB Shoulders

Lead - 0.0 to 0.5 ft

Total Number of Observations	10	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	5.6	Mean	65.8
Maximum	210	Median	61
SD	61.67	Std. Error of Mean	19.5
Coefficient of Variation	0.937	Skewness	1.454
Mean of logged data	3.693	SD of logged data	1.169
		90% Standard Bootstrap UCL	90.1
		95% Standard Bootstrap UCL	96.6

Lead - 1 to 1.5 ft

Total Number of Observations	10	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	0.72	Mean	3.7
Maximum	7.1	Median	4
SD	2.021	Std. Error of Mean	0.639
Coefficient of Variation	0.543	Skewness	-0.088
Mean of logged data	1.117	SD of logged data	0.741
		90% Standard Bootstrap UCL	4.5
		95% Standard Bootstrap UCL	4.7

Lead - 2.5 to 3 ft

Total Number of Observations	10	Number of Distinct Observations	8
		Number of Missing Observations	0
Minimum	0.86	Mean	3.1
Maximum	4.9	Median	2.8
SD	1.24	Std. Error of Mean	0.392
Coefficient of Variation	0.401	Skewness	-0.216
Mean of logged data	1.034	SD of logged data	0.507
		90% Standard Bootstrap UCL	3.6
		95% Standard Bootstrap UCL	3.7

Lead - 3.5 to 4 ft

Total Number of Observations	10	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	1.6	Mean	2.9
Maximum	5.3	Median	2.45
SD	1.219	Std. Error of Mean	0.386
Coefficient of Variation	0.426	Skewness	1.043
Mean of logged data	0.976	SD of logged data	0.399
		90% Standard Bootstrap UCL	3.3
		95% Standard Bootstrap UCL	3.5

SUMMARY OF STATISTICAL ANALYSIS
 EA 12-0M3501
 INTERSTATE 405 FROM SB CULVER DRIVE OFFRAMP TO JEFFREY ROAD/UNIVERSITY DRIVE OC
 IRVINE, ORANGE COUNTY, CALIFORNIA

SB SHOULDERS

Total Lead UCLs (mg/kg)		
Sample Interval (feet)	90% UCL	95% UCL
0.0 to 0.5	90.1	96.6
1.0 to 1.5	4.5	4.7
2.5 to 3.0	3.6	3.7
3.5 to 4.0	3.3	3.5

Excavation Scenarios

Excavation Depth	90% UCL		95% UCL	
	Total Lead (mg/kg)	Soluble (WET) Lead * (mg/l)	Total Lead (mg/kg)	Soluble (WET) Lead * (mg/l)
0.0 to 0.5 foot	90.1	4.2	96.6	4.5
Underlying Soil (0.5 to 4.0 feet)	16.3	0.8	17.4	0.8
0.0 to 1.0 foot	90.1	4.2	96.6	4.5
Underlying Soil (1.0 to 4.0 feet)	4.0	0.2	4.2	0.2
0.0 to 1.5 feet	61.6	2.8	66.0	3.0
Underlying Soil (1.5 to 4.0 feet)	3.9	0.2	4.1	0.2
0.0 to 2.0 feet	47.3	2.2	50.7	2.3
Underlying Soil (2.0 to 4.0 feet)	3.8	0.2	3.9	0.2
0.0 to 2.5 feet	38.7	1.8	41.5	1.9
Underlying Soil (2.5 to 4.0 feet)	3.5	0.2	3.6	0.2
0.0 to 3.0 feet	32.9	1.5	35.2	1.6
Underlying Soil (3.0 to 4.0 feet)	3.5	0.2	3.6	0.2
0.0 to 3.5 feet	28.7	1.3	30.7	1.4
Underlying Soil (3.5 to 4.0 feet)	3.3	0.2	3.5	0.2
0.0 to 4.0 feet	25.5	1.2	27.3	1.3

Notes:

UCL = Upper Confidence Limit

90% UCL applicable for waste classification and onsite reuse

95% UCL applicable for risk assessment and offsite disposal

mg/kg = milligrams per kilogram

mg/l = milligrams per liter

* = Soluble (WET) lead concentrations were predicted using slope of the regression line,

where y = predicted soluble (WET) lead and x = total lead

Regression Line Slope:

$$y = 0.0461 x$$

Project Name: Interstate 405 from SB Culver Drive Offramp to Jeffrey Road/University Drive OC
Geocon Project No.: S9890-06-10
Sample Population: Borings B49 to B53, B56, B57, B59, and B60
Sample Location: Culver Drive SB Loop Onramp, Offramp, Shoulders

Lead - 0.0 to 0.5 ft

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	24	Mean	141.1
Maximum	310	Median	130
SD	93.54	Std. Error of Mean	31.18
Coefficient of Variation	0.663	Skewness	0.481
Mean of logged data	4.692	SD of logged data	0.832
		90% Standard Bootstrap UCL	177.5
		95% Standard Bootstrap UCL	190.1

Lead - 1 to 1.5 ft

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	1.4	Mean	6.9
Maximum	24	Median	4
SD	7.358	Std. Error of Mean	2.453
Coefficient of Variation	1.063	Skewness	2.001
Mean of logged data	1.565	SD of logged data	0.854
		90% Standard Bootstrap UCL	9.8
		95% Standard Bootstrap UCL	10.8

Lead - 2.5 to 3 ft

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	0.9	Mean	3.4
Maximum	8.5	Median	3
SD	2.168	Std. Error of Mean	0.723
Coefficient of Variation	0.635	Skewness	1.786
Mean of logged data	1.066	SD of logged data	0.61
		90% Standard Bootstrap UCL	4.3
		95% Standard Bootstrap UCL	4.5

Lead - 3.5 to 4 ft

Total Number of Observations	9	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	0.27	Mean	4.0
Maximum	12	Median	3.8
SD	3.467	Std. Error of Mean	1.156
Coefficient of Variation	0.864	Skewness	1.612
Mean of logged data	0.959	SD of logged data	1.152
		90% Standard Bootstrap UCL	5.4
		95% Standard Bootstrap UCL	5.8

SUMMARY OF STATISTICAL ANALYSIS
 EA 12-0M3501
 INTERSTATE 405 FROM SB CULVER DRIVE OFFRAMP TO JEFFREY ROAD/UNIVERSITY DRIVE OC
 IRVINE, ORANGE COUNTY, CALIFORNIA

CULVER DRIVE SB LOOP ONRAMP, OFFRAMP, SHOULDERS

Total Lead UCLs (mg/kg)		
Sample Interval (feet)	90% UCL	95% UCL
0.0 to 0.5	177.5	190.1
1.0 to 1.5	9.8	10.8
2.5 to 3.0	4.3	4.5
3.5 to 4.0	5.4	5.8

Excavation Scenarios

Excavation Depth	90% UCL		95% UCL	
	Total Lead (mg/kg)	Soluble (WET) Lead * (mg/l)	Total Lead (mg/kg)	Soluble (WET) Lead * (mg/l)
0.0 to 0.5 foot	177.5	8.2	190.1	8.8
Underlying Soil (0.5 to 4.0 feet)	31.6	1.5	33.9	1.6
0.0 to 1.0 foot	177.5	8.2	190.1	8.8
Underlying Soil (1.0 to 4.0 feet)	7.2	0.3	7.9	0.4
0.0 to 1.5 feet	121.6	5.6	130.3	6.0
Underlying Soil (1.5 to 4.0 feet)	6.7	0.3	7.3	0.3
0.0 to 2.0 feet	93.7	4.3	100.5	4.6
Underlying Soil (2.0 to 4.0 feet)	6.0	0.3	6.4	0.3
0.0 to 2.5 feet	76.9	3.5	82.5	3.8
Underlying Soil (2.5 to 4.0 feet)	4.7	0.2	4.9	0.2
0.0 to 3.0 feet	64.8	3.0	69.5	3.2
Underlying Soil (3.0 to 4.0 feet)	4.9	0.2	5.2	0.2
0.0 to 3.5 feet	56.1	2.6	60.2	2.8
Underlying Soil (3.5 to 4.0 feet)	5.4	0.2	5.8	0.3
0.0 to 4.0 feet	49.8	2.3	53.4	2.5

Notes:

UCL = Upper Confidence Limit

90% UCL applicable for waste classification and onsite reuse

95% UCL applicable for risk assessment and offsite disposal

mg/kg = milligrams per kilogram

mg/l = milligrams per liter

* = Soluble (WET) lead concentrations were predicted using slope of the regression line,

where y = predicted soluble (WET) lead and x = total lead

Regression Line Slope:

$$y = 0.0461 x$$

Memorandum

*Serious drought.
Help save water!*

To: Mrs. Traci Menard
Branch Chief
Bridge Design South 1
Division of Engineering Services

Attention: Mr. Gabriel Galo

Date: February 10, 2016

File: 12-ORA-405-PM
2.6/5.83
EA 12-0M350
EFIS. 1212000018
Bridge No. 55E0171

From: DEPARTMENT OF TRANSPORTATION
Division of Engineering Services
METS-Geotechnical Service
Office of Geotechnical Design South

Subject: Geotechnical design report for retaining wall No. 335 (Bridge No. 55E0171)

INTRODUCTION

As requested by your office dated March 18, 2015, the following is the geotechnical recommendations for the retaining wall No. 335 associated with the Abutment No. 1 of the Culver Drive UC Bridge improvement project in Orange County.

PROJECT LOCATION

The job site is at the intersection of Culver Drive and Interstate 405 (I-405), in District 12, Orange County (Figure 1).

SCOPE OF WORK

The geotechnical work performed for this project includes:

- Review of geologic information.
- Visual inspection of job site.
- Laboratory tests.
- Subsurface exploration.
- Interpretation of subsurface geologic and groundwater conditions.
- Preparation of this memorandum to present geotechnical recommendation for the design of the proposed retaining wall.

PROJECT DESCRIPTION

Based on the Structure Design request, the structure included in the project that requires geotechnical recommendations is a combination of sub-horizontal ground anchor diaphragm wall and soil nail wall that will be constructed to provide room to extend the second auxiliary lane of the SB I-405 between Jeffrey Road OC and Culver Drive off ramp.

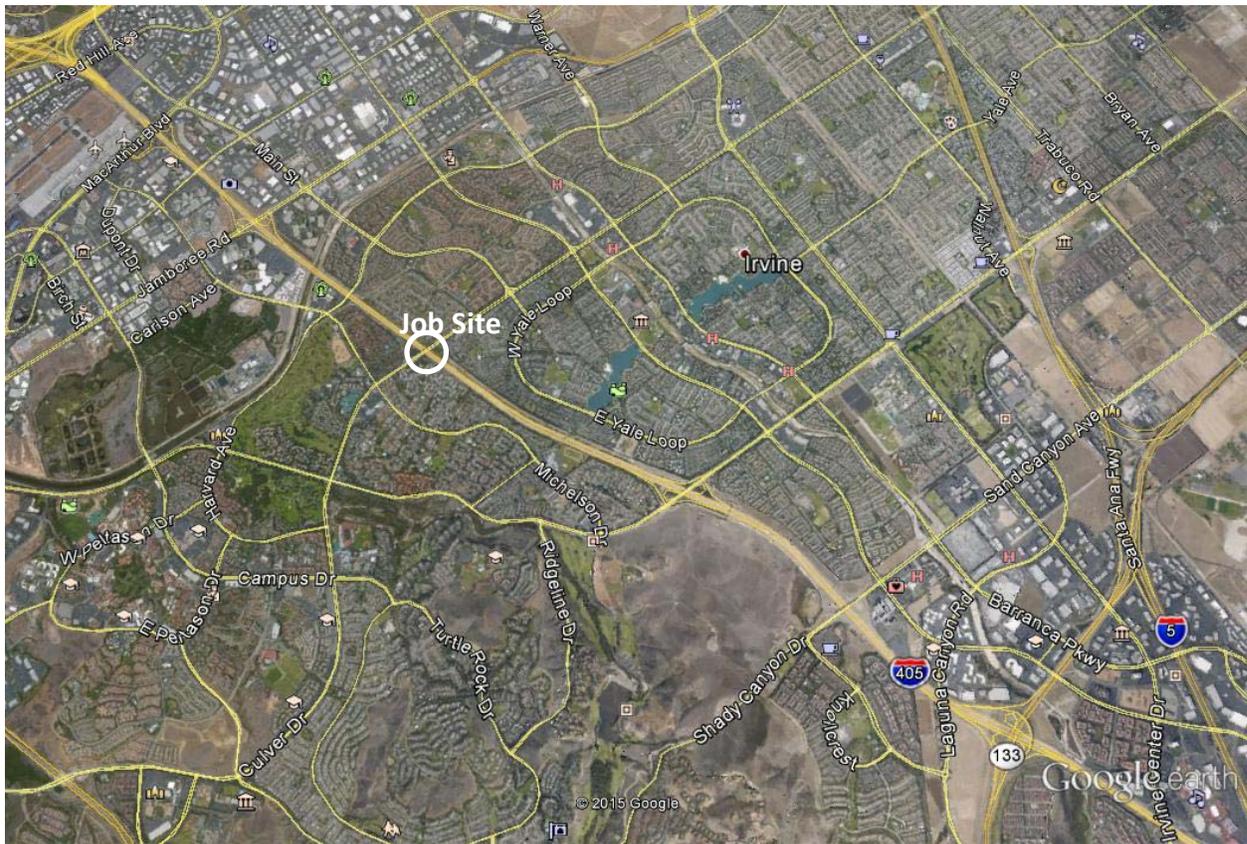


Figure 1. Job Site Vicinity Map

PROPOSED EARTH RETAINING SYSTEM

According to the layout, and cross sections provided by the Structure Design, approximated locations and estimated wall heights are summarized in the Table 1.

Table 1. Summary of Retaining Wall No. 335

ERS Type	RW 335 LOL		Length (ft)	Approx. Max. Height (ft)
	Begin	End		
Soil Nail	10+00.00	10+31.42	31.42	17.88
Ground Anchor	10+31.42	11+43.98	112.56	17.94
Soil Nail	11+43.98	13+11.13	167.15	17.56

SUBSURFACE EXPLORATION

Previous Site Investigation

As-Built Log Of Test Borings (LOTBs) from a previous subsurface exploration for the consideration of the bridge as a part of the “As-Built” plan, dated April 1965 are available. Based on the “As-Built”

“Provide a safe, sustainable, integrated and efficient transportation system to enhance California’s economy and livability”

LOTBs, three boreholes including two penetrations and one rotary wash boreholes were advanced to depths of approximately 30 feet to 40 feet.

Current Field Program

Subsurface exploration for this project was performed on August 4, 2015. Subsurface exploration applicable for the subject retaining wall includes one borehole using hollow-stem auger (6.5 inch outer diameter). Standard Penetration Tests (SPT's) were performed during boring. SPT N-Values were recorded at 5 foot intervals during drilling. The SPTs were performed in accordance with ASTM Test Method D1586. Boring information is summarized in Table 2. Boring was logged based on visual observations of the soil cuttings and collected samples. The location and elevation of this boring was provided by the District Surveys.

Table 2. Summary of Subsurface Investigation

Boring No.	Completion Date	Drill Rig Type	Hammer Type	Hammer Efficiency	Approx. Ground Surface Elevation (ft)	Boring Depth (ft)
A-15-001	8/4/2015	Acker AD2	Automatic	68	75.40	50

LABORATORY TEST

The samples obtained during the subsurface exploration were assigned to the laboratory for visual examination and testing. The soils were classified in accordance with Soil and Rock Logging. Classification, and Presentation Manual, Caltrans June 2010. The laboratory testing program consisted of corrosivity tests, particle-size analysis, and Atterberg Limits of soils.

SITE GEOLOGY AND SUBSURFACE CONDITIONS

Site Geology

For this report we reviewed the Preliminary Digital Geologic Map of the Santa Ana 30'X60' Quadrangle, Southern California, Version 2.0, Compiled by D.M. Morton (2004). According to Morton (2004), the project is underlain by young axial channel deposits, Qya (Holocene and latest Pleistocene). These are fluvial alluvium deposited along canyon floors that consist of unconsolidated sand, silt, and clay. The map represents the area as Qyaca, (see Figure 2) indicating that specific area is mostly clay-bearing (c) and arenaceous or sandy (a).

The project is also underlain by young alluvial fan deposits, Qyf (Holocene and latest Pleistocene). The alluvial fan deposits consist of gravel, sand, and silt. Morton (2004) represents this area as Qyfa, (see Figure 2) indicating this specific area is mostly arenaceous (a) or sandy.

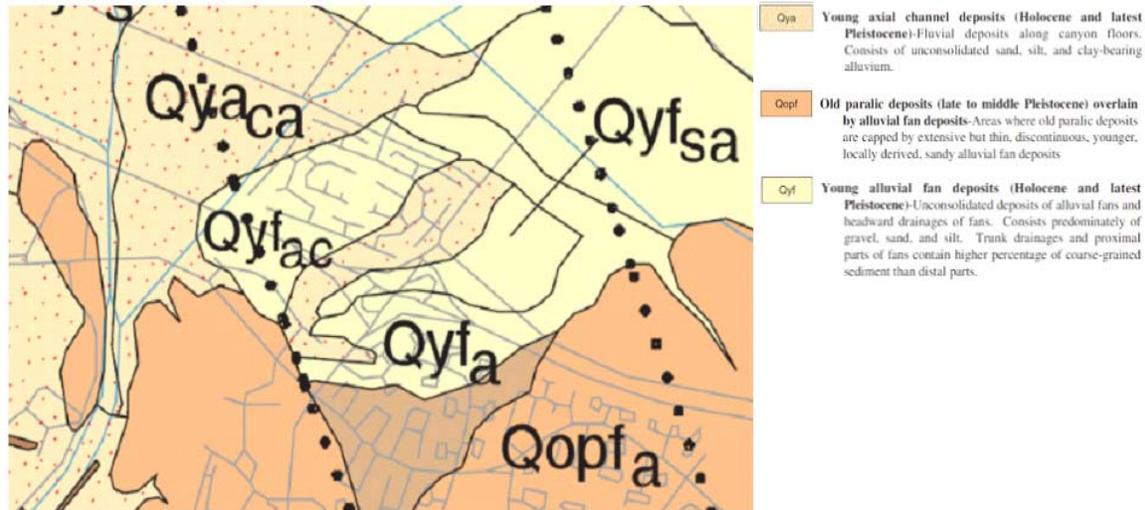


Figure 2. Job Site Vicinity Geologic Map

Subsurface Conditions

The soils encountered at the project site during current subsurface exploration are generally confirmed the soil conditions described on the “As-Built LOTB dated April 1965. The generalized stratigraphic profile at the borehole location consisted of medium dense silty sand and medium dense clayey sand (elev. 50 feet to elev. 75 feet), stiff sandy lean clay to medium dense silty sand (elev. 30 feet to elev.50 feet), and medium dense poorly graded sand with silt (elev. 25 feet to elev.30 feet).

Groundwater

Ground water was encountered within the boring drilled during the current subsurface exploration (August 4, 2015) at elev. of 28.4 feet, and the boring performed on August 19, 1965 at elev. of 24 feet. It should be noted that ground water table levels can fluctuate with the change of season and other factors including local irrigation, seasonal rains, and local surface hydrology.

SEISMIC STUDY

Ground Motion

The job site is not located within any reported Alquist-Priolo Earthquake Fault Zone. Based on the Caltrans ARS online tool (v2.3.06), proposed retaining wall is 1.6 miles (2.5 km) from, and to the southwest of the San Joaquin Hills Fault. As summarized in Table 3, this fault is a reverse fault, for which the magnitude of the maximum credible earthquake (MCE) is 7.0. The design median peak ground acceleration (PGA) at bridge location is approximately 0.63g.

Table 3. Summary of Seismic Parameters

Fault	Fault Type	Maximum Magnitude (MMax)	Distance	Fault Dip	Dip Direction	PGA
San Joaquin Hills	Rev	7.0	1.6 mile (2.5 km)	23 degrees	W	0.63g

Based on the soil properties of as-built LOTBs, the job site is classified as Site Class D. With the site class and standard penetration test (SPT) N values, soil shear velocity (V_{30} , average shear velocity in top 30 meter) was estimated as 886 ft/sec (270 m/sec). The recommended design response spectrum which is composed of both deterministic and probabilistic spectra is shown on Figure 3.

Liquefaction

Based on the subsurface condition and the groundwater information presented in the current subsurface exploration, the liquefaction potential is considered low.

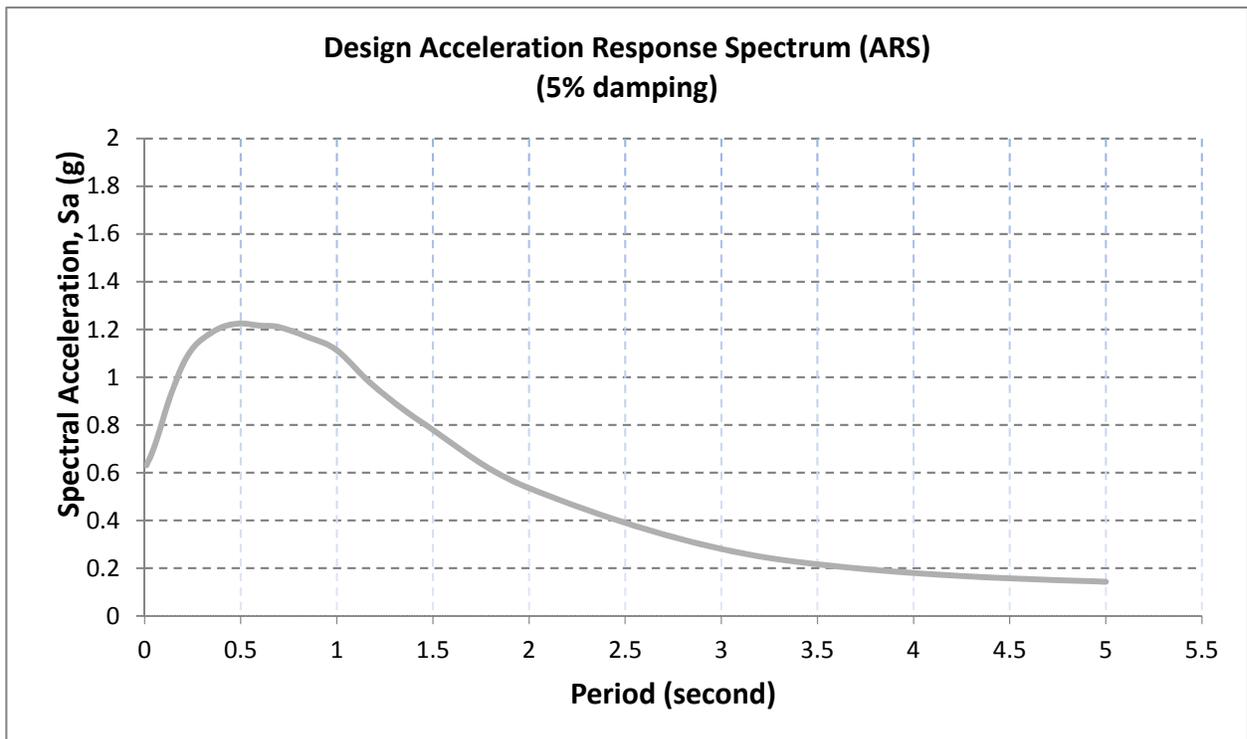


Figure 3. Recommended Acceleration Response Spectra (ARS) curve

Ground Rupture

Since no known fault crosses the job site, the potential for ground rupture at this site due to fault movement is negligible.

CORROSIVITY

Corrosivity of subsurface materials at the depth of 15-ft and 25-ft below the existing grade was tested and reported on August 20, 2015 in accordance with CTM 643, 417, and 422. The test results summarized in Table 4 indicated that the subsurface materials in the project area are non-corrosive.

Table 4. Corrosion Test Summary of the Composite Samples

TL 101 Number	Boring Number	Sample Depth (ft)	pH	Minimum Resistivity (ohm-cm)	Chloride Content (ppm)	Sulfate Content (ppm)
C721734A	A-15-001	15	8.77	762	100	442
C721734B	A-15-001	35	8.40	649	280	273

Note:

The Caltrans Corrosion Guidelines state that if the minimum resistivity is greater than 1000 Ohm-Cm the sample is considered to be non corrosive and testing to determine sulfate and chloride is not performed. Caltrans currently considers a site to be corrosive to foundation elements if one or more of the following conditions exist: Chloride concentration is greater than or equal to 500 ppm, sulfate concentration is greater than or equal to 2000 ppm, or the pH is 5.5 or less.

GEOTECHNICAL EVALUATION AND RECOMMENDATIONS

Evaluation of Feasible ERS Types

For the proposed cut wall beneath Abutment 1 of the Culver Drive UC Bridge, a combination of ground anchored diaphragm wall and soil nail walls can be used based on the subsurface condition from the subsurface exploration, available LOTBs and regional geological information. The pre-stressed ground anchor can provide lateral support to the walls, and reduce the lateral movement of the wall during and after construction.

Recommendation

Based on the evaluation of the wall types in the previous section, and available subsurface information, following retaining walls are recommended for this project:

Ground anchored diaphragm wall beneath Abut.1 of the Culver Drive UC Bridge (RW 335 LOL, 10+31.42 to 11+43.98).

Soil nail wall beneath Abut.1 of the Culver Drive UC Bridge (RW 335 LOL, 10+00.00 to 10+31.42, and 11+43.98 to 13+11.13).

Soil Engineering Properties

For design purposes this soil material is considered medium dense, equivalent to the moist unit weight of 120 pcf and a friction angle of 32 degrees. Soil engineering properties used in the proposed retaining wall design are summarized in the Table 4.

Table 4. Soil Engineering Properties

Layer No.	Elevation (ft)	Soil Type	Shear Strength Parameters	SPT N values
1	50 - 75	Silty SAND	$\gamma = 120$ pcf; $\phi = 32^\circ$	9 - 19
2	30 - 50	Sandy lean Clay,	$\gamma = 120$ pcf; undrained shear strength 1200 psf	10 - 24
3	25 - 30	Poorly graded SAND with Silt	$\gamma = 120$ pcf; $\phi = 32^\circ$	15

Note: depths are measured from top of the slope grade

Soil Nail Wall Design (RW 335 LOL, 10+00.00 to 10+31.42, and 11+43.98 to 13+11.13).

For the design of the recommended soil nail walls, the computer program SNAIL was used. Following are the geotechnical design criteria for the soil nail walls:

Static Case: Minimum Factor of Safety: 1.5

Seismic Case: Minimum Factor of Safety: 1.1

Non-dimensional horizontal seismic coefficient $k_h = 0.2$

Soil Nail $f_y = 75$ ksi

Inclination from horizontal: 15 degree

Soil Nail Bar Dia: 1 inch

Table 5. Soil Nail Wall Design

Wall Zone	RW 335 LOL	Minimum Embedment Length (ft)	Maximum Nail Spacing vertical (ft)	Maximum Nail Spacing horizontal (ft)	Pullout Resistance Q_d (lb/ft)	Minimum Threaded Bar Size	Minimum Allowable Facing Resistance (static/seismic)
1	10+00.00 to 10+31.42	20	5	5	2500	#8	(28/38) kips
2	11+43.98 to 13+11.13	20	5	5	2500	#8	(28/38) kips

Note:

1. Square nail layout pattern should be used.
2. The wall height is the vertical distance from the original ground at the top of the wall to the finished grade at the toe of the wall.
3. The nails are inclined 15 degrees from horizontal.
4. First row of the nails should be placed 2.5 to 3.0 feet below the original ground, and vertical nail spacing needs to be adjusted in areas with geometric constraints.

Ground Anchor Wall Design (RW 335 LOL, 10+31.42 to 11+43.98).

For the global design of the recommended ground anchor wall, the computer program SLOPE/W was used. Ground anchors should be inclined 15 degrees (no less than 10 degrees) from horizontal.

Unbonded Length of Anchored Wall

Unbonded length should be at least 25 feet for seating loss control upon anchor lock-off.

CONSTRUCTION CONSIDERATIONS

SS 19-3 Structure Excavation and Backfill

Section 19-3.01A(3)(b) Wall Zones.

The wall zones for the soil nail wall at Culver Dr. are shown in the Table 6.

Table 6. Soil Nail Wall Zones

Wall zone	Beginning station (RW 335 LOL)	End station (RW 335 LOL)	Upper elevation (ft)	Lower elevation (ft)
1	10+00.00	10+31.42	64.27	53.07
2	11+43.98	13+11.13	64.46	51.44

The wall zone for the ground anchor wall at Culver Dr. is shown in the in the Table 7

Table 7. Ground Anchor Wall Zone

Wall zone	Beginning station (RW 335 LOL)	End station (RW 335 LOL)	Upper elevation (ft)	Lower elevation (ft)
1	10+31.42	11+43.98	62.74	53.24

SS 46-2 Ground Anchors

Section 46-2.03A Geotechnical Issues during Ground Anchor Installation

Stability test for temporary cut, performance test and proof test for the ground anchor should be performed in the field in accordance with Caltrans Specifications. The subsurface condition is generally uniform within the limits of temporary cut. The ground anchors are to be installed under the existing abutment footing. Care should be taken to avoid conflict with existing piles during drilling operation through the existing pile group. Cave-in potential of the slope materials may be anticipated in areas with granular materials during the ground anchor wall construction.

SS 46-3 Soil Nails

Section 46-3.01D(2)(b)(iii)

In addition to the proof test soil nails shown, install and test 1 proof test soil nails at each wall zone determined by the engineer.

Section 46-3.03A Geotechnical Issues during Soil Nail Installation

Special equipment may be needed for the soil nail wall construction because of dense soil materials. Cave-in potential of the slope materials may be anticipated in areas with granular materials during the soil nail wall construction.

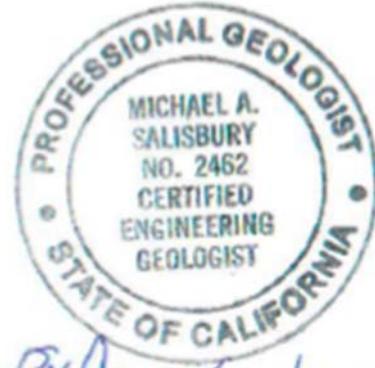
If you have any questions or comments, please call Sungro Cho at (916) 227-5398, or James Lee at (916) 227-7066 or Michael Salisbury at (916) 227-5392 or Deh-Jeng Jang at (916) 227-5722.

Prepared by: Date: 2/10/2016



Sungro Cho

Sungro Cho, Ph.D., P.E.
Transportation Engineer
Branch A



EXP: 2/28/2017
Michael Salisbury

Michael Salisbury, C.E.G.
Engineering Geologist
Branch A



James

Ngar Kok James LEE, Ph.D., P.E.
Transportation Engineer
Branch A